



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)



## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2023-24/ 2668

DATE: 25 AUG 2023

### NOTIFICATION

- Subject:** Tentative Academic Calendar of 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University regarding...
- Reference:** Dean faculty of Engineering, VTU Belagavi approval dated 24.08.2023  
Hon'ble Vice-Chancellor's approval dated: 24.08.2023

The tentative academic calendar concerned to 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University for academic year 2023-24 are hereby notified as mentioned below;

	I semester B.E./B.Tech (2022 scheme)	I semester B.Plan/B.Arch (2022 scheme)	VII semester B.E./B.Tech (2018 scheme)
Commencement of the Semester	04.09.2023	04.09.2023	14.08.2023
# Internship/Students Induction Program	04.09.2023 To 14.09.2023	04.09.2023 To 14.09.2023	14.08.2023 To 09.09.2023
Commencement of Classes	15.09.2023	15.09.2023	11.09.2023
Last Working day of the Semester	06.01.2024	06.01.2024	06.01.2024
Practical Examination	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024
Theory Examinations	22.01.2024 To 17.02.2024	22.01.2024 To 17.02.2024	22.01.2024 To 09.02.2024
Commencement of NEXT Semester	19.02.2024	19.02.2024	13.02.2024

# Internship for VI semester completed students and Students Induction Program for 1<sup>st</sup> semester Students

**Please Note:**

- The academic sessions for ODD semesters should commence on the **date mentioned above.**



**\*\* Induction Program** shall be conducted for 11 days at the beginning of 1<sup>st</sup> semester and 10 days at the beginning of the 2<sup>nd</sup> semester. During the induction program, college has to brief about the new curriculum that implemented from the academic year 2022-23.

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges**. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- The circular related to AICTE Activity point will be issued by the Registrar's office separately.
- If any suggestions/clarification/correction, please email to -[sbhvtuso@yahoo.com](mailto:sbhvtuso@yahoo.com)

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges, Chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. OS for information and make arrangements to send the circular regarding AICTE Activity Points
9. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Ry 25/08/23 BE  
REGISTRAR  
7



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 240546

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference:VTU/BOS/AC2023-24(EVEN)/6251

2 FEB 2024

## NOTIFICATION

**Subject:** Tentative Academic Calendar for II sem B.E./B.Tech/B.Plan/B.Des/B.Arch, IV sem B.Arch./B.Plan., and VI sem of B.Arch/B.Plan, regarding...

**Reference:** Hon'ble Vice-Chancellor's approval Dated: 08.02.2024

The tentative academic calendar concerned with EVEN semesters of undergraduate programs(II sem B.E./B.Tech/B.Plan/B.Des/B.Arch, IV sem B.Arch./B.Plan., and VI sem of B.Arch/B.Plan)is attached to this notification for reference to all the stakeholders concerned.

The principals of non-autonomous, constituent, and autonomous engineering colleges and chairpersons of university departments are hereby informed to bring the academic calendar to the attention of all concerned.

If any suggestions/clarification/corrections, email-[sbhalbhavi@vtu.ac.in](mailto:sbhalbhavi@vtu.ac.in)

Sd/-

REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi.
9. Office copy


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REGISTRAR

7/10/24

## Academic Calendar for EVEN Semester of UG programs for the year 2023-24

	II semester B.E./B.Tech	II semester B.Plan/B.Arch/ B.Des	II semester B.Sc(Hons)	IV semester B.Arch.	IV semester B.Plan	VI Semester B.Arch.	VI semester B. Plan
Commencement of the Semester	06.03.2024	06.03.2024	04.03.2024	04.03.2024	04.03.2024	26.02.202	06.03.2024
Internship / Students Induction Program	---	---	---	---	---	---	---
Commencement of Classes	06.03.2024	06.03.2024	06.03.2024	06.03.2024	06.03.2024	26.02.2024	06.03.2024
Last Working day of the Semester	29.06.2024	29.06.2024	29.06.2024	29.06.2024	29.06.2024	22.06.2024	29.06.2024
Practical Examination	01.07.2024 To 11.07.2024	01.07.2024 To 11.07.2024	01.07.2024 To 06.07.2024	01.07.2024 To 06.07.2024	01.07.2024 To 06.07.2024	25.07.2024 To 31.07.2024	01.07.2024 To 06.07.2024
Theory Examinations	15.07.2024 To 10.08.2024	15.07.2024 To 10.08.2024	08.07.2024 To 27.07.2024	08.07.2024 To 27.07.2024	08.07.2024 To 02.08.2024	08.07.2024 To 02.08.2024	08.07.2024 To 02.08.2024
Internship/ Practical Exam for Lateral Entry Students	---	---	---	---	03.08.2024 To 31.08.2024	---	03.08.2024 To 31.08.2024
Internship Viva Voce/ Project viva	---	---	---	---	---	---	---
Commencement of NEXT Semester	19.08.2024	19.08.2024	19.08.2024	05.08.2024	02.09.2024	05.08.2024	02.09.2024

  
**REGISTRAR**  
 Visvesvaraya Technological University  
 BELAGAVI.





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 2405

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference: VTU/BOS/AC2023-24/6540

Dated:

27 FEB 2024

### REVISED- NOTIFICATION

**Subject:** Tentative **Revised-Academic Calendar** for III and IV semesters B.E./B.Tech., programs, regarding...

**Reference:** VTU/BOS/AC2023-24(ODD)/5858, 24.01.2024  
VTU/BOS/AC2023-24(EVEN)/6379, Dated: 19.02.2024  
Hon'ble Vice-Chancellor's approval Dated: 27.02.2024

The tentative revised academic calendar concerned with III and IV semester B.E./B.Tech. programmes for the academic year 2023-24 is attached to this notification for reference to all the stakeholders concerned. (The previously published academic calendar VTU/BOS/AC2023-24/6379, dated February 19, 2024, stands cancelled.)

The principals of non-autonomous, constituent, and autonomous engineering colleges and chairpersons of university departments are hereby, informed to bring the **revised academic calendar** to the attention of all concerned.

If any suggestions/clarification/corrections, email-[sbhvtuso@yahoo.com](mailto:sbhvtuso@yahoo.com)

Sd/-

REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson/Program coordinators, of the university Departments at Belagavi, Bengaluru, Mysuru and Kalburgi

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi.
9. Office copy

Ras 27/2/24 BE  
REGISTRAR  
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## Tentative Revised-Academic Calendar for III and IV Semesters of B.E./B.Tech., programs for the year 2023-24

	Regular Admitted Students	Lateral Entry (Diploma Graduate) Students	Working Professional (Diploma Graduates)	Remarks (Only applicable for Students admitted under working professional Category)
Commencement of the 3 <sup>rd</sup> Semester	15.11.2023		12.02.2024	
Commencement of Classes	15.11.2023		12.02.2024	
Last Working day of the 3 <sup>rd</sup> Semester	09.03.2024		13.04.2024	Students have to complete Theory CIE only and Practical CIE and SEE examination.
Practical Examination (Regular Students)	30.03.2024 To 12.04.2024			
Theory Examinations	13.03.2024 To 27.03.2024			
Commencement of 4 <sup>th</sup> Semester	15.04.2024		15.04.2024	
Commencement of the 4 <sup>th</sup> Semester and class	15.04.2024			Students have to complete Theory SEE within 15 days at the beginning of the 4 <sup>th</sup> semester
Last Working day of the Semester	27.07.2024			
Practical Examination (Regular Students)	29.07.2024 to 07.08.2024			Common to all
Theory Examinations	08.08.2024 to 28.08.2024			Common to all
Practical Examinations (For Lateral Entry Students)	-----			
Commencement of 5 <sup>th</sup> Semester	02.09.2024			

**Please Note:**

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete academic activities within the academic duration mentioned. For regular and lateral entry, students' academic activities should be conducted as per the academic calendar mentioned above.

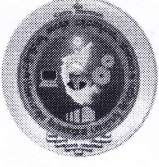


- For students admitted under working professional quota
  - The college has to prepare a flexible timetable for the students admitted under the category of **working professionals** so that they can attend the classes. However, as per AICTE guidelines, 60% of the classes can be held in **OFFLINE** mode and 40% of the classes can be conducted in **ONLINE** mode.
  - If required, the college can plan to have extra classes on the 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete the academic activities of the students admitted under the working professionals' category within the academic duration mentioned.
  - The faculty handling the classes for working professionals has to maintain the attendance record properly and produce it whenever the university asks for it.
  - Working professionals admitted to Autonomous Colleges have to follow the scheme and syllabus of the Autonomous scheme.
  - Within the last working day, the students admitted under the working professional quota have to complete all **theory classes** and **CIE of all theory** classes. The College has to enter the CIE marks on the VTU examination portal.
  - Within the last working days, the college has to conduct **CIE and the SEE after completion of all practical sessions** for working professional. **(SEE will be conducted with two examiners from the same college only). The college has to enter both CIE and SEE marks on the VTU examination web portal.**
  - Marks entry on the VTU web portal should be completed by the **12<sup>th</sup> and 13<sup>th</sup> of April 2024**
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can be made with the information to the University.
- The faculty/staff shall be available to undertake any work assigned by the university.
- If any suggestions/clarification please email-**sbhvtuso@yahoo.com**

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

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 27/02/24  
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# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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"JnanaSangama" Belagavi-590018, Karnataka, India

**Prof. Dr. B. E. Rangaswamy, Ph.D.**  
REGISTRAR

**Phone: (0831) 2498100**  
**Fax : (0831) 2405467**

REF: VTU/BGM/ACA/2023-24/ 3252

DATE: 30 SEP 2023

### NOTIFICATION

- Subject:** Tentative Academic Calendar of 1st semester of B.Sc(Hons) program, 3<sup>rd</sup> and 5<sup>th</sup> semesters B.E./B.Tech. programs, 4<sup>th</sup> semester of MBA(IEV) program regarding...
- Reference:** Hon'ble Vice-Chancellor's approval dated: 30.09.2023

The tentative academic calendar concerned to 1st semester of B.Sc.(Hons) program, 3<sup>rd</sup> and 5<sup>th</sup> semesters B.E./B.Tech. programs, 4<sup>th</sup> semester of MBA(IEV) program for academic year 2023-24 are hereby notified as mentioned below;

	III semester B.E./B.Tech. (2022 scheme)	V semester B.E./ B.Tech. (2021 scheme)	I sem B.Sc(Hons)	IV semester MBA(IEV)*
Commencement of the Semester	25.10.2023	25.10.2023	03.10.2023	09.10.2023
Internship	----	25.10.2023 To 23.11.2023	---	----
Commencement of Classes	25.10.2023	25.11.2023	03.10.2023	09.10.2023
Last Working day of the Semester	10.02.2024	09.03.2024	25.01.2024	27.01.2024
Practical Examination/ Internship Viva Voce/ Project viva	12.02.2024 To 22.02.2024	11.03.2024 To 20.03.2024	29.01.2024 To 09.02.2024	01.02.2024 To 08.02.2024
Theory Examinations	26.02.2024 To 15.03.2024	22.03.2024 To 20.04.2024	12.02.2024 To 01.03.2024	
Commencement of NEXT Semester	18.03.2024	22.04.2024	04.03.2024	-----

\*Students have to complete skill certification and Internship within this duration (09.10.2023 to 27.01.2024)



**Please Note:**

- The academic sessions for semesters should commence on the **date mentioned** above.
- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the academic duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges**. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- If any suggestions/clarification/correction, please email to **-sbhvtuso@yahoo.com**

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges, Chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-  
REGISTRAR

**To,**

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Rax  
30/09/13 BE  
REGISTRAR  
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# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Ref. VTU/BOS/AC-PG-6<sup>th</sup> sem BE/2023-24/ 239

Dated:

15 APR 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of - IV semester MCA/M.Tech/M/Arch/M.Plan and VI semester B.E./B.Tech., programs academic calendar regarding...

**Reference:** 01. Dean faculty of Engineering approval dated 14.04.2024  
02. The Hon'ble Vice-Chancellor's approval date: 15.04.2024

The tentative Academic Calendar of - IV semester MCA/M.Tech/M/Arch/M.Plan and VI semester B.E./B.Tech., programs are published as below:

	IV semester MCA	IV semester M.Tech.	IV Semester M.Arch.	IV Semester M.Plan.	VI semester B.E./ B.Tech.
Commencement of the Semester	22.04.2024	22.04.2024	22.04.2024	22.04.2024	29.04.2024
Commencement of Classes	22.04.2024	22.04.2024	22.04.2024	22.04.2024	29.04.2024
Last Working day of the Semester	27.07.2024	27.07.2024	27.07.2024	27.07.2024	31.07.2024
Practical / Viva- Examination/Inter nship Viva Voce	28.07.2024 To 29.07.2024				01.08.2024 To 10.08.2024
Theory Examinations	01.08.2024 To 23.08.2024	01.08.2024 To 23.08.2024	29.07.2024 To 02.08.2024	01.08.2024 To 23.08.2024	12.08.2024 To 14.09.2024
Project viva	Will be announced after the submission of the Thesis				---
Submission of the report to university	13.07.2024 To 27.07.2024	01.08.2024 To 20.08.2024	01.08.2024 To 10.08.2024	01.08.2024 To 10.08.2024	----
Commencement of NEXT Semester	---	---	---	---	## 23.09.2024

## Commencement of the swapped VII/VIII semester. 50% strength of the students may take up an Internship (VIII sem) immediately after 14.09.2024 and the remaining 50% strength of the students may take up VII semester (23.09.2024)

The principals of all the colleges are hereby informed to bring the content of the NOTIFICATION to the notice of all concerned.

Sd/-

REGISTRAR

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**Please Note:**

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete academic activities within the academic duration mentioned.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- The faculty/staff shall be available to undertake any work assigned by the university.
- If any suggestions/clarification please email-[registrar@vtu.ac.in](mailto:registrar@vtu.ac.in)

**To,**

The Principals of all the Engineering Colleges under the ambit of the university  
The Chairpersons/Program coordinators of the University Departments at Kalaburgi, Bengaluru,  
Mysuru and Belagavi

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
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7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi.
9. Office copy

*R. S. Srinivas*  
**REGISTRAR**  
*[Signature]*





# ವಿಶ್ವವಿದ್ಯಾರಣ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ 1994"ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 2405468

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference: VTU/BGM/AC /2023-24/6085

Dated: 2 FEB 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of VIII semester B.E./B.Tech.,/B.Arch/B.Plan programs regarding...

**Reference:** Dean Faculty of Engineering Approval Dated: 14.01.2024  
The Hon'ble Vice Chancellor's approval dated: 14.01.2024

The Tentative academic calendar concerned to VIII semesters' of B.E./B.Tech.,/B.Arch/B.Plan programs for the academic year 2023-24 is hereby notified as follows;

	VIII semester B.E./B.Tech.,	VIII semester B. Plan	VIII semester B.Arch.
Commencement of the Semester	12.02.2024	26.02.2024	01.02.2024
Commencement of Classes	12.02.2024	26.02.2024	01.02.2024
Last Working Day of the Semester	11.05.2024	25.05.2024	25.05.2024
Practical Examination	-----	-----	27.05.2024 To 01.06.2024
Theory Examinations	13.05.2024 To 21.05.2024	03.06.2024 To 12.06.2024	03.06.2024 To 27.06.2024
Internship/Practical Exam for Lateral Entry Students	----	----	----
Internship Viva Voce/ Project viva	23.05.2024 To 30.05.2024	----	----
Commencement of NEXT Semester	----	----	----

**Please Note:**

- The academic sessions for semesters should commence on the **date mentioned** above.

- If required, the college can plan to have extra classes on the 1st and 3rd Saturdays and Sundays to complete academic activities within the academic duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's concurrence.
- If any suggestions/clarification please email to [-sbhalbhavi@vtu.ac.in](mailto:sbhalbhavi@vtu.ac.in)

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

**To,**

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. **The Director of Physical Education, VTU Belagavi for information**
6. **The Director, Central Placement Cell, VTU Belagavi for information**
7. **The Special Officer Library, VTU Belagavi for information**
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi
9. Office copy

Re 02/02/24 B-E  
REGISTRAR  
7



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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Web : https://vtu.ac.in

Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

REF: VTU/BGM/BoS/Academic Calendar/2023-24 604

DATE: 11 MAY 2024

### Revised-NOTIFICATION

**Subject:** Revised-Tentative Academic Calendar of 1st semester of MCA/M.Tech/MBA/M.Arch /M.Plan./M.Sc. programs, regarding...  
**Reference:** Hon'ble Vice-Chancellor's approval dated: 11.05.2024

The tentative academic calendar concerned to 1<sup>st</sup> semester of MCA/M.Tech/MBA/M.Arch /M.Plan/ M.Sc. programs, for the academic year 2023-24 are with this notified as mentioned below;

	I semester MCA/M.Tech/MBA /M.Arch/M.Plan/M.Sc Existing Dates	Revised Date	Remarks (If any)
Commencement of the Semester	12.02.2024	12.02.2024	
Commencement of Classes	12.02.2024	12.02.2024	
Last Working day of the Semester	25.05.2024	08.06.2024	
Practical Examination/ Internship Viva Voce/ Project viva	27.05.2024 To 31.05.2024	10.06.2024 To 15.06.2024	Not applicable to MBA
Theory Examinations	03.06.2024 To 20.06.2024	18.06.2024 To 05.07.2024	
Project/Internship	-----	08.07.2024 To 13.07.2024	Societal Project for MBA students
Commencement of NEXT Semester	25.06.2024	15.07.2024	

#### Please Note:

- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.

1/2

*h*



- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's concurrence.
- If any suggestions/clarification please email to -[sbhalbhavi@vtu.ac.in](mailto:sbhalbhavi@vtu.ac.in)

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

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2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

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Ra 11/05/14 BE  
REGISTRAR  
7.



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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Web : https://vtu.ac.in

Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

REF: VTU/BGM/BoS/Academic Calendar/2024-25 1573

DATE: - 8 JUL 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of 2<sup>nd</sup> semester of Post Graduate programs regarding...

**Reference:** Approval of Dean Faculty of Engineering dated: 02.07.2024  
The approval Hon'ble Vice-Chancellor, dated 05.07.2024

The tentative academic calendar concerned the 2<sup>nd</sup> semester of Post Graduate programs for the academic year 2023-24 are with this notified as mentioned below;

	II semester MBA	II semester M. Tech.	II semester M. Arch	II Semester M. Plan	II semester MCA	II Semester M.Sc.
Commencement of the Semester	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024
Internship	----	----	----	----	----	----
Commencement of Classes	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024
Last Working day of the Semester	19.10.2024	19.10.2024	19.10.2024	19.10.2024	19.10.2024	19.10.2024
Practical / Viva-Examination	----	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024
Theory Examinations	22.10.2024 To 20.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024
Commencement of NEXT Semester	25.11.2024	25.11.2024	25.11.2024	25.11.2024	25.11.2024	25.11.2024

#### Please Note:

- The academic sessions for the aforementioned semesters should commence on the **date mentioned** above.
- If required, the college can plan extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's concurrence.

1/2



- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
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- If any suggestions/clarification please email-**registrar@vtu.ac.in**

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

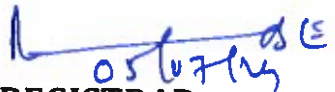

Sd/-  
REGISTRAR

**To,**

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
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8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi
9. Office copy

  
REGISTRAR  




# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 2405466

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference: VTU/BOS/AC2023-24(EVEN)/6883

Dated: 26 MAR 2024

### NOTIFICATION

**Subject:** Revised Academic Calendar for III semester MBA program, regarding...

**Reference:** VTU/BGM/Reg€/PS/2023-2024/1693, Dated: 13.03.2024

Hon'ble Vice-Chancellor's approval Dated: 25.04.2024

The revised academic calendar concerned with III semesters of MBA., programs for the academic year 2023-24 is attached to this notification for reference to all the stakeholders concerned.

The principals of non-autonomous, constituent, and autonomous engineering colleges and chairpersons of university departments are hereby informed to bring therevised academic calendar to the attention of all concerned.

If any suggestions/clarification/corrections, email-[registrar@vtu.ac.in](mailto:registrar@vtu.ac.in)

**Encl: Academic Calendar**

Sd/-

REGISTRAR

**To,**

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

**Copy to.**

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8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi.
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h

**Revised Academic Calendar for MBA III semester for AY 2023-24**

-----	Existing	(Revised)
<b>Commencement of the Semester</b>	<b>01.12.2023</b>	<b>01.12.2023</b>
<b>Internship</b>	<b>----</b>	<b>----</b>
<b>Commencement of Classes</b>	<b>01.12.2023</b>	<b>01.12.2023</b>
<b>Last Working Day of the Semester</b>	<b>13.03.2024</b>	<b>13.03.2024</b>
<b>Internship Viva- Examination</b>	<b>---</b>	<b>18.04.2024 To 22.04.2024</b>
<b>Theory Examinations</b>	<b>18.03.2024 To 17.04.2024</b>	<b>18.03.2024 To 17.04.2024</b>
<b>Project Work (Training)</b>	<b>18.04.2024 To 01.06.2024</b>	<b>23.04.2024 To 06.06.2024</b>
<b>Submission of the report to university</b>		
<b>Commencement of NEXT Semester</b>	<b>03.06.2024</b>	<b>10.06.2024</b>

*26/03/24* ASE  
**REGISTRAR**  
*[Signature]*



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

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Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

REGISTRAR

REF: VTU/BGM/BoS/Academic Calendar/2023-24 1010

DATE: 04 JUN 2024

## NOTIFICATION

**Subject:** Tentative Academic Calendar of 4<sup>th</sup> semester of MBA. programs, regarding...

**Reference:** Hon'ble Vice-Chancellor's approval dated: 04.06.2024

The tentative academic calendar concerned to the 4<sup>th</sup> semester of MBA, for the academic year 2023-24 are with this notified as mentioned below;

Details	IV Semester MBA
Commencement of the Semester	10.06.2024
Internship / Students Induction Program	-----
Commencement of Classes	10.06.2024
Last Working day of the Semester	28.09.2024
Practical Examination	----
Theory Examinations	30.09.2024 To 06.11.2024
Internship/Practical Exam for Lateral Entry students	
Submission of the report to university	13.09.2024 To 28.09.2024
Commencement of NEXT Semester	----

**Please Note:**

- The academic sessions for EVEN semesters should commence on the **date mentioned** above.
- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sunday to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
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The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

**To,**

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering & Communication Electronics Engineering of the University.

**Copy to.**

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9. Office copy

**REGISTRAR**





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

REF: VTU/BGM/BoS/Academic Calendar/2023-24 604

DATE: 11 MAY 2024

### Revised-NOTIFICATION

**Subject:** Revised-Tentative Academic Calendar of 1st semester of MCA/M.Tech/MBA/M.Arch /M.Plan./M.Sc. programs, regarding...  
**Reference:** Hon'ble Vice-Chancellor's approval dated: 11.05.2024

The tentative academic calendar concerned to 1<sup>st</sup> semester of MCA/M.Tech/MBA/M.Arch /M.Plan/ M.Sc. programs, for the academic year 2023-24 are with this notified as mentioned below;

	I semester MCA/M.Tech/MBA /M.Arch/M.Plan/M.Sc Existing Dates	Revised Date	Remarks (If any)
Commencement of the Semester	12.02.2024	12.02.2024	
Commencement of Classes	12.02.2024	12.02.2024	
Last Working day of the Semester	25.05.2024	08.06.2024	
Practical Examination/ Internship Viva Voce/ Project viva	27.05.2024 To 31.05.2024	10.06.2024 To 15.06.2024	Not applicable to MBA
Theory Examinations	03.06.2024 To 20.06.2024	18.06.2024 To 05.07.2024	
Project/Internship	-----	08.07.2024 To 13.07.2024	Societal Project for MBA students
Commencement of NEXT Semester	25.06.2024	15.07.2024	

#### Please Note:

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Sd/-

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*Ra 11/05/14* *AE*  
**REGISTRAR**  
*7.*



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

REF: VTU/BGM/BoS/Academic Calendar/2024-25 1573

DATE: - 8 JUL 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of 2<sup>nd</sup> semester of Post Graduate programs regarding...

**Reference:** Approval of Dean Faculty of Engineering dated: 02.07.2024  
The approval Hon'ble Vice-Chancellor, dated 05.07.2024

The tentative academic calendar concerned the 2<sup>nd</sup> semester of Post Graduate programs for the academic year 2023-24 are with this notified as mentioned below;

	II semester MBA	II semester M. Tech.	II semester M. Arch	II Semester M. Plan	II semester MCA	II Semester M.Sc.
Commencement of the Semester	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024
Internship	----	----	----	----	----	----
Commencement of Classes	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024
Last Working day of the Semester	19.10.2024	19.10.2024	19.10.2024	19.10.2024	19.10.2024	19.10.2024
Practical / Viva-Examination	----	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024
Theory Examinations	22.10.2024 To 20.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024
Commencement of NEXT Semester	25.11.2024	25.11.2024	25.11.2024	25.11.2024	25.11.2024	25.11.2024

#### Please Note:

- The academic sessions for the aforementioned semesters should commence on the **date mentioned** above.
- If required, the college can plan extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's concurrence.

1/2

- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
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- If any suggestions/clarification please email-**registrar@vtu.ac.in**

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

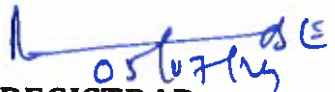

Sd/-  
REGISTRAR

**To,**

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
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7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi
9. Office copy

  
REGISTRAR  






# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)



## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994) "Jnana Sangama" Belagavi-590018, Karnataka, India)

Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax: (0831) 2405467

REF: VTU/BGM/BoS/Academic Calendar/2023-24 4307

DATE: 24 NOV 2023

### NOTIFICATION

**Subject:** Tentative Academic Calendar of 3rd semester of  
MCA/M.Tech/MBA/M.Arch /M.Plan . programs, regarding...  
**Reference:** Hon'ble Vice-Chancellor's approval dated: 24.11.2023

The tentative academic calendar concerned to 3rd semester of  
MCA/M.Tech/MBA/M.Arch /M.Plan programs, for academic year 2023-24 are hereby  
notified as mentioned below;

	III semester MCA	III semester M.Tech	III semester MBA	III semester M.Arch	III semester M.Plan
Commencement of the Semester	11.12.2023	11.12.2023	01.12.2023	11.12.2023	11.12.2023
Commencement of Classes	11.12.2023	11.12.2023	01.12.2023	11.12.2023	11.12.2023
Last Working day of the Semester	23.03.2024	23.03.2024	13.03.2024	23.03.2024	23.03.2024
Practical Examination/ Internship Viva Voce/ Project viva	25.03.2024 To 30.03.2024	25.03.2024 To 30.03.2024	----	----	27.03.2024 To 30.03.2024
Theory Examinations	01.04.2024 To 18.04.2024	01.04.2024 To 18.04.2024	18.03.2024 To 17.04.2024	01.04.2024 To 12.04.2024	01.04.2024 To 12.04.2024
Internship	----	----	18.04.2024 To 01.06.2024	----	----
Commencement of NEXT Semester	22.04.2024	22.04.2024	03.06.2024	22.04.2024	12.04.2024

#### Please Note:

- The academic sessions for semesters should commence on the **date mentioned** above.
- If required, the college can plan to have extra classes' on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the academic duration mentioned.



- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
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- If any suggestions/clarification please email to **-sbhvtuso@yahoo.com**

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

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6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi
9. Office copy

Raw 24/11/23 BE

REGISTRAR

24/11/23





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 2405467

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Ref. VTU/BOS/AC-PG-6<sup>th</sup> sem BE/2023-24/ 239

Dated:

15 APR 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of - IV semester MCA/M.Tech/M/Arch/M.Plan and VI semester B.E./B.Tech., programs academic calendar regarding...

**Reference:** 01. Dean faculty of Engineering approval dated 14.04.2024  
02. The Hon'ble Vice-Chancellor's approval date: 15.04.2024

The tentative Academic Calendar of - IV semester MCA/M.Tech/M/Arch/M.Plan and VI semester B.E./B.Tech., programs are published as below:

	IV semester MCA	IV semester M.Tech.	IV Semester M.Arch.	IV Semester M.Plan.	VI semester B.E./ B.Tech.
Commencement of the Semester	22.04.2024	22.04.2024	22.04.2024	22.04.2024	29.04.2024
Commencement of Classes	22.04.2024	22.04.2024	22.04.2024	22.04.2024	29.04.2024
Last Working day of the Semester	27.07.2024	27.07.2024	27.07.2024	27.07.2024	31.07.2024
Practical / Viva- Examination/Inter nship Viva Voce	28.07.2024 To 29.07.2024				01.08.2024 To 10.08.2024
Theory Examinations	01.08.2024 To 23.08.2024	01.08.2024 To 23.08.2024	29.07.2024 To 02.08.2024	01.08.2024 To 23.08.2024	12.08.2024 To 14.09.2024
Project viva	Will be announced after the submission of the Thesis				---
Submission of the report to university	13.07.2024 To 27.07.2024	01.08.2024 To 20.08.2024	01.08.2024 To 10.08.2024	01.08.2024 To 10.08.2024	----
Commencement of NEXT Semester	---	---	---	---	## 23.09.2024

## Commencement of the swapped VII/VIII semester. 50% strength of the students may take up an Internship (VIII sem) immediately after 14.09.2024 and the remaining 50% strength of the students may take up VII semester (23.09.2024)

The principals of all the colleges are hereby informed to bring the content of the NOTIFICATION to the notice of all concerned.

Sd/-

REGISTRAR

*h*



**Please Note:**

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete academic activities within the academic duration mentioned.
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- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- The faculty/staff shall be available to undertake any work assigned by the university.
- If any suggestions/clarification please email-[registrar@vtu.ac.in](mailto:registrar@vtu.ac.in)

**To,**

The Principals of all the Engineering Colleges under the ambit of the university  
The Chairpersons/Program coordinators of the University Departments at Kalaburgi, Bengaluru,  
Mysuru and Belagavi

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
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9. Office copy

*R. S. Srinivas*  
**REGISTRAR**  
*[Signature]*



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 240546

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

REF: VTU/BGM/BoS/Academic Calendar/2024-25 1573

DATE: - 8 JUL 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of 2<sup>nd</sup> semester of Post Graduate programs regarding...

**Reference:** Approval of Dean Faculty of Engineering dated: 02.07.2024  
The approval Hon'ble Vice-Chancellor, dated 05.07.2024

The tentative academic calendar concerned the 2<sup>nd</sup> semester of Post Graduate programs for the academic year 2023-24 are with this notified as mentioned below;

	II semester MBA	II semester M. Tech.	II semester M. Arch	II Semester M. Plan	II semester MCA	II Semester M.Sc.
Commencement of the Semester	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024
Internship	----	----	----	----	----	----
Commencement of Classes	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024	15.07.2024
Last Working day of the Semester	19.10.2024	19.10.2024	19.10.2024	19.10.2024	19.10.2024	19.10.2024
Practical / Viva-Examination	----	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024	21.10.2024 To 26.10.2024
Theory Examinations	22.10.2024 To 20.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024	28.10.2024 To 16.11.2024
Commencement of NEXT Semester	25.11.2024	25.11.2024	25.11.2024	25.11.2024	25.11.2024	25.11.2024

#### Please Note:

- The academic sessions for the aforementioned semesters should commence on the **date mentioned** above.
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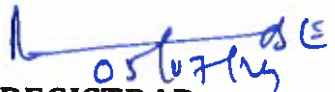

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REGISTRAR

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9. Office copy

  
REGISTRAR  






# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994) "Jnana Sangama" Belagavi-590018, Karnataka, India)

Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax: (0831) 2405467

REF: VTU/BGM/BoS/Academic Calendar/2023-24 4307

DATE: 24 NOV 2023

### NOTIFICATION

**Subject:** Tentative Academic Calendar of 3rd semester of MCA/M.Tech/MBA/M.Arch /M.Plan . programs, regarding...  
**Reference:** Hon'ble Vice-Chancellor's approval dated: 24.11.2023

The tentative academic calendar concerned to 3rd semester of MCA/M.Tech/MBA/M.Arch /M.Plan programs, for academic year 2023-24 are hereby notified as mentioned below;

	III semester MCA	III semester M.Tech	III semester MBA	III semester M.Arch	III semester M.Plan
Commencement of the Semester	11.12.2023	11.12.2023	01.12.2023	11.12.2023	11.12.2023
Commencement of Classes	11.12.2023	11.12.2023	01.12.2023	11.12.2023	11.12.2023
Last Working day of the Semester	23.03.2024	23.03.2024	13.03.2024	23.03.2024	23.03.2024
Practical Examination/ Internship Viva Voce/ Project viva	25.03.2024 To 30.03.2024	25.03.2024 To 30.03.2024	----	----	27.03.2024 To 30.03.2024
Theory Examinations	01.04.2024 To 18.04.2024	01.04.2024 To 18.04.2024	18.03.2024 To 17.04.2024	01.04.2024 To 12.04.2024	01.04.2024 To 12.04.2024
Internship	----	----	18.04.2024 To 01.06.2024	----	----
Commencement of NEXT Semester	22.04.2024	22.04.2024	03.06.2024	22.04.2024	12.04.2024

#### Please Note:

- The academic sessions for semesters should commence on the **date mentioned** above.
- If required, the college can plan to have extra classes' on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the academic duration mentioned.



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Raw 24/11/23 BE

REGISTRAR

24/11/23





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

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Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Ref. VTU/BOS/AC-PG-6<sup>th</sup> sem BE/2023-24/ 239

Dated:

15 APR 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of - IV semester MCA/M.Tech/M/Arch/M.Plan and VI semester B.E./B.Tech., programs academic calendar regarding...

**Reference:** 01. Dean faculty of Engineering approval dated 14.04.2024  
02. The Hon'ble Vice-Chancellor's approval date: 15.04.2024

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Project viva	Will be announced after the submission of the Thesis				---
Submission of the report to university	13.07.2024 To 27.07.2024	01.08.2024 To 20.08.2024	01.08.2024 To 10.08.2024	01.08.2024 To 10.08.2024	----
Commencement of NEXT Semester	---	---	---	---	## 23.09.2024

## Commencement of the swapped VII/VIII semester. 50% strength of the students may take up an Internship (VIII sem) immediately after 14.09.2024 and the remaining 50% strength of the students may take up VII semester (23.09.2024)

The principals of all the colleges are hereby informed to bring the content of the NOTIFICATION to the notice of all concerned.

Sd/-

REGISTRAR

*h*



**Please Note:**

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete academic activities within the academic duration mentioned.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- The faculty/staff shall be available to undertake any work assigned by the university.
- If any suggestions/clarification please email-[registrar@vtu.ac.in](mailto:registrar@vtu.ac.in)

**To,**

The Principals of all the Engineering Colleges under the ambit of the university  
The Chairpersons/Program coordinators of the University Departments at Kalaburgi, Bengaluru,  
Mysuru and Belagavi

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi.
9. Office copy

*R. S. Srinivas*  
**REGISTRAR**  
*[Signature]*





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ 1994"ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 24054

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

**Prof. B. E. Rangaswamy, Ph.D.**  
REGISTRAR

REF: VTU/BGM/BoS/Academic Calendar/2023-24 604

DATE: 11 MAY 2024

### Revised-NOTIFICATION

**Subject:** Revised-Tentative Academic Calendar of 1st semester of MCA/M.Tech/MBA/M.Arch /M.Plan./M.Sc. programs, regarding...  
**Reference:** Hon'ble Vice-Chancellor's approval dated: 11.05.2024

The tentative academic calendar concerned to 1<sup>st</sup> semester of MCA/M.Tech/MBA/M.Arch /M.Plan/ M.Sc. programs, for the academic year 2023-24 are with this notified as mentioned below;

	I semester MCA/M.Tech/MBA /M.Arch/M.Plan/M.Sc Existing Dates	Revised Date	Remarks (If any)
Commencement of the Semester	12.02.2024	12.02.2024	
Commencement of Classes	12.02.2024	12.02.2024	
Last Working day of the Semester	25.05.2024	08.06.2024	
Practical Examination/ Internship Viva Voce/ Project viva	27.05.2024 To 31.05.2024	10.06.2024 To 15.06.2024	Not applicable to MBA
Theory Examinations	03.06.2024 To 20.06.2024	18.06.2024 To 05.07.2024	
Project/Internship	-----	08.07.2024 To 13.07.2024	Societal Project for MBA students
Commencement of NEXT Semester	25.06.2024	15.07.2024	

#### Please Note:

- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.

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- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's concurrence.
- If any suggestions/clarification please email to -[sbhalbhavi@vtu.ac.in](mailto:sbhalbhavi@vtu.ac.in)

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
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6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
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Ra 11/05/14 BE  
REGISTRAR  
7.



**THE OXFORD COLLEGE OF ENGINEERING**

Hosur Road, Bommanahalli, Bangaluru - 560 068

**TENTATIVE CALENDAR OF EVENTS FOR ODD SEMESTER - 2023-24  
FOR UG BE - I SEMESTER**

COMMENCEMENT FROM 04-09-2023 to 06-01-2024

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	Sept	4 (FWD)	5	6	7	8	9	6	4th to 14th - Induction Programme
2	Sept	11	12	13	14	15	16 (H)	5	Commencement of 1st sem Classes
3	Sept	18 (H)	19	20	21	22	23	5	18th Ganesha Chaturthi
4	Sept	25	26	27	28 (H)	29	30	5	28th - Eid-Milad
5	Oct	2 (H)	3	4	5	6	7(H)	4	2nd - Gandhi Jayanthi
6	Oct	9	10	11	12	13	14 (H)	5	14th - Mahalaya Amavasya
7	Oct	16	17	18	19	20	21 (H)	5	
8	Oct	23 (H)	24(H)	25	26	27	28 (H)	3	23rd - Ayudha Puja 24th - Vijayadashami 28th Valmiki Jayanthi
9	Oct/Nov	30	31	1(H)	2	3	4 (H)	4	1st - Kannada Rajyothsava
10	Nov	6 (CIE-I)	7 (CIE-I)	8 (CIE-I)	9 (CIE-I)	10	11	6	6th, 7th, 8th and 9th CIE-1
11	Nov	13	14 (H)	15	16	17	18 (H)	4	14th - Balipadyami, Deepavali
12	Nov	20	21	22	23	24	25 (PTM)	6	
13	Nov/Dec	27	28	29	30 (H)	1	2 (H)	4	30th - Kanakadasa Jayanthi
14	Dec	4	5	6	7	8	9	6	
15	Dec	11	12	13	14	15	16 (H)	5	
16	Dec	18	19	20	21	22	23	6	
17	Dec	25 (H)	26	27	28 (CIE-II)	29 (CIE-II)	30	5	25th - Christmas, 28th and 29th CIE-2
18	Jan-24	1	2 (CIE-II)	3 (CIE-II)	4	5	6 (H) LWD	5	2nd and 3rd CIE-2 6th - Last working Day

Inuction: 04-09-2023 to 15-09-2023

Practical Examination : 08-01-2024 to 19-01-2024

Theory Examination : 22-01-2024 to 17-02-2024

Commencement of NEXT Semester : 19-02-2024

*[Signature]*  
HOD-SEH 15/09/2023

*[Signature]*  
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Bangaluru, 560 068



**TENTATIVE CALENDAR OF EVENTS FOR EVEN SEMESTER - 2023-24  
FOR UG BE - II SEMESTER**

**COMMENCEMENT FROM 06-03-2024 to 29-06-2024**

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	Mar			6(FWD)	7	8(H)	9	3	Commencement of classes 6th-9th, Induction Programme, 8th- Maha Shivarathri
2	Mar	11	12	13	14	15	16 (H)	5	
3	Mar	18	19	20	21	22	23	6	
4	Mar	25	26	27	28	29 (H)	30	5	29th - Good Friday
5	Mar/Apr	1	2	3	4	5	6(H)	5	
6	Apr	8	9(H)	10	11(H)	12	13	4	9th - Ugadi, 11th- Ramzan
7	Apr	15	16	17	18	19	20 (H)	5	
8	Apr	22	23	24	25	26	27	6	
9	Apr/May	29 (CIE-I)	30 (CIE-I)	1(H)	2 (CIE-I)	3 (CIE-I)	4 (H)	4	29th-30th, 2nd -3rd May -CIE-I 1st -May Day
10	May	6	7	8	9	10(H)	11	5	10th- Basava Jayanthi
11	May	13	14	15	16	17	18 (H)	5	PTM 1
12	May	20	21	22	23	24	25	6	
13	May/Jun	27	28	29	30	31	1(H)	5	
14	Jun	3	4	5	6	7	8	6	
15	Jun	10	11	12	13	14	15 (H)	5	
16	Jun	17 (H)	18	19	20	21	22	5	17th- Bakrd, CIE-II
17	Jun	24 (CIE-II)	25 (CIE-II)	26 (CIE-II)	27 (CIE-II)	28	29 LWD	6	29th - Last working Day, 24th to 27th CIE 2, PTM -2 On 30th July

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Inuction: 06-03-2024 to 09-03-2024

Practical Examination : 01-07-2024 to 11-07-2024

Theory Examination : 15-07-2024 to 10-08-2024

Commencement of Odd Semester : 19-08-2024

*[Signature]*  
 HoD, Professor and Head  
 Department of Science & Human Res  
 The Oxford College of Engineering  
 Bangalore-560068

*[Signature]*  
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 Bangalore-560 068



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Hosur Road, Bommanahalli, Bengaluru - 560 068

**TENTATIVE CALENDAR OF EVENTS FOR ODD SEMESTER - 2023-24  
FOR UG BE - 3rd SEMESTER****COMMENCEMENT FROM 15-11-2023 to 20-02-2024**

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	sat		
1	Nov	-	-	15 (FWD)	16	17	18 (H)	3	15th - Commencement of the Semester
2	Nov	20	21	22	23	24	25	6	
3	Nov/Dec	27	28	29	30 (H)	1	2 (H)	4	30th - Kanakadasa Jayanthi
4	Dec	4	5	6	7	8	9	6	
5	Dec	11	12	13	14	15	16 (H)	5	
6	Dec	18	19	20	21	22	23	6	
7	Dec	25 (H)	26 (CIE 1)	27 (CIE 1)	28 (CIE 1)	29 (CIE 1)	30 (PTM)	5	25th - Christmas, 26th, 27th, 28th and 29th CIE - 1 & 30th PTM
8	Jan-24	1	2	3	4	5	6 (H)	5	
9	Jan	8	9	10	11	12	13	6	
10	Jan	15 (H)	16	17	18	19	20 (H)	4	15th - Makara Sankranti
11	Jan	22	23	24	25	26 (H)	27	5	26th - Republic Day
12	Jan/Feb	29	30	31	1	2	3 (H)	5	
13	Feb	5	6	7	8	9	10	6	
14	Feb	12 (CIE 2)	13 (CIE 2)	14 (CIE 2)	15 (CIE 2)	16	17 (H)	5	12th, 13th, 14th & 15th - CIE - 2
15	Feb	19	20 (LWD)	-	-	-	-	2	

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**TENTATIVE CALENDAR OF EVENTS FOR EVEN SEMESTER - 2023-24**  
**FOR UG BE - 4TH SEMESTER**

**COMMENCEMENT FROM 22-04-2024 to 07-08-2024**

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April	22 (FWD)	23	24	25	26	27	6	22nd - First Working Day
2	April/May	29	30	1 (II)	2	3	4 (II)	4	1st - May Day
3	May	6	7	8	9	10 (II)	11	5	10th - Basava Jayanthi
4	June	13	14	15	16	17	18 (II)	5	
5	July	20	21	22	23	24	25	6	
6	May/June	27	28	29	30	31	1 (II)	5	
7	June	3	4	5	6	7	8	6	
8	June	10 (CIE-1)	11 (CIE-1)	12 (CIE-1)	13	14	15 (II)	5	10th to 12th CIE - 1
9	June	17 (II)	18	19	20	21	22 (PTM)	5	17th - Bakrid 22nd - PTM
10	June	24	25	26	27	28	29	6	
11	July	1	2	3	4	5	6 (II)	5	
12	July	8	9	10	11	12	13	6	
13	July	15	16	17 (II)	18	19	20 (II)	4	17th - Last Day of Moharam
14	July	22	23	24	25	26	27	6	
15	July/Aug	29 (CIE-2)	30 (CIE-2)	31 (CIE-2)	1	2	3 (II)	5	29th to 31st - CIE - 2
16	Aug	5	6	7 (LWD)	-	-	-	3	7th - Last Working Day

Commencement of Practicals from 08-08-2024 to 17-08-2024

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Commencement of Theory Exams from 19-08-2024 to 12-09-2024

Commencement of next semester 16-09-2024

*A. Jayaram*  
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**TENTATIVE CALENDAR OF EVENTS FOR ODD SEMESTER - 2023-24  
FOR UG BE - 5th SEMESTER****COMMENCEMENT FROM 25-11-2023 - 09-03-2024**

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	sat		
1	Nov						25 (FWD)	1	
2	Nov/Dec	27	28	29	30 (H)	1	2 (H)	4	30th - Kanakadasa Jayanthi
3	Dec	4	5	6	7	8	9	6	
4	Dec	11	12	13	14	15	16 (H)	5	
5	Dec	18	19	20	21	22	23	6	
6	Dec	25 (H)	25	27	28 (CIE-1)	29 (CIE-1)	30 (CIE-1)	5	25th - Christmas, 28th, 29th & 30th - 1st CIE
7	Jan-24	1	2	3	4	5	6 (H)	5	
8	Jan	8	9	10	11	12	13	6	
9	Jan	15 (H)	16	17	18	19	20 (H)	4	15th - Makara Sankranti
10	Jan	22	23	24	25	26 (H)	27	5	26th - Republic Day
11	Jan/Feb	29 (CIE-2)	30 (CIE-2)	31 (CIE-2)	1	2	3 (H)	5	29th, 30th, & 31st - CIE -2
12	Feb	5	6	7	8	9	10	6	
13	Feb	12	13	14	15	16	17 (H)	5	
14	Feb	19	20	21	22	23	24	6	
15	Feb/Mar	26	27	28	29	1	2 (H)	5	
16	March	4 (CIE-3)	5 (CIE-3)	6 (CIE-3)	7	8 (H)	9 (LWD)	5	8th - Mahashivaratri 4th, 5th & 6th CIE - 3

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**TENTATIVE CALENDAR OF EVENTS FOR EVEN SEMESTER - 2023-24  
 FOR UG BE - 6TH SEMESTER**

COMMENCEMENT FROM 29-04-2024 to 31-07-2024

SLNo	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April/May	29 (FWD)	30	1(H)	2	3	4 (H)	4	29th - First Working Day 1st - May Day
2	May	6	7	8	9	10(H)	11	5	10th - Basava Jayanthi
3	June	13	14	15	16	17	18 (H)	5	
4	July	20	21	22	23	24	25	6	
5	May/June	27	28	29	30	31	1 (H)	5	
6	June	3 (CIE-1)	4 (CIE-1)	5 (CIE-1)	6	7	8 (PTM)	6	3rd to 5th - CIE - 1 8th - PTM
7	June	10	11	12	13	14	15 (H)	5	
8	June	17 (H)	18	19	20	21	22	5	17th - Bakrid
9	June	24	25	26	27	28	29	6	
10	July	1	2	3 (CIE-2)	4 (CIE-2)	5 (CIE-2)	6 (H)	5	3rd to 5th - CIE - 2
11	July	8	9	10	11	12	13	6	
12	July	15	16	17 (H)	18	19	20 (H)	4	17th - Last Day of Moharam
13	July	22	23	24	25 (CIE-3)	26 (CIE-3)	27 (CIE-3)	6	25th to 27th - CIE - 3
14	July	29	30	31 (LWD)				3	31st - Last Working Day
Commencement of Practicals/Viva/Intsrship Viva from 01-08-2024 to 10-08-2024								71	
Commencement of Theory Exams from 12-08-2024 to 14-09-2024									
Commencement of next semester 23-09-2024									

*(Signature)*  
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 Bommanahalli, Hosur Road  
 Bengaluru-560 068





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**TENTATIVE CALENDAR OF EVENTS FOR ODD SEMESTER - 2023-24  
 FOR UG BE - 7TH SEMESTER**

**COMMENCEMENT FROM 11-09-2023 to 06-01-2024**

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	sat		
1	Sept	11 (FWD)	12	13	14	15	16 (H)	4	11th - First Working Day
2	Sept	18 (H)	19	20	21	22	23	5	18th - Varasidhi Vinayaka Vratha
3	Sept	25	26	27	28 (H)	29	30 (H)	4	28th - Eid-Milad
4	Oct	2 (H)	3	4	5	6	7 (H)	4	2nd - Gandhi Jayanthi
5	Oct	9	10	11	12	13	14 (H)	5	14th - Mahalaya Amavasya
6	Oct	16 (CIE-1)	17 (CIE-1)	18 (CIE-1)	19	20 (PTM)	21 (H)	5	16th, 17th, 18th - CIE - 1 & 20th PTM
7	Oct	23 (H)	24(H)	25	26	27	28 (H)	3	23rd - Ayudha Puja 24th - Vijayadashami 28th Valmiki Jayanthi
8	Oct/Nov	30	31	1(H)	2	3	4 (H)	4	1st - Kannada Rajyothsava
9	Nov	6	7	8	9	10	11	6	
10	Nov	13	14 (H)	15	16	17	18 (H)	4	14th - Balipadyami, Deepavali
11	Nov	20 (CIE-2)	21 (CIE-2)	22 (CIE-2)	23	24	25 (PTM)	6	20th, 21st and 22nd, CIE - 2 & 25th PTM
12	Nov/Dec	27	28	29	30 (H)	1	2 (H)	4	30th - Kanakadasa Jayanthi
13	Dec	4	5	6	7	8	9	6	
14	Dec	11	12	13	14	15	16 (H)	5	
15	Dec	18	19	20	21	22	23	6	
16	Dec	25 (H)	26	27 (CIE 3)	28 (CIE 3)	29 (CIE 3)	30 (PTM)	5	25th - Christmas, 27th, 28th and 29th CIE - 3 & 30th PTM
17	Jan-24	1	2	3	4	5	6 (H) LWD	5	6th - Last working Day



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**TENTATIVE CALENDAR OF EVENTS FOR EVEN SEMESTER - 2023-24**  
**FOR UG BE - 8TH SEMESTER**

**COMMENCEMENT FROM 12-02-2024 to 11-05-2024**

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	sat		
1	Feb	12	13	14	15	16	17 (H)	5	
2	Feb	19	20	21	22	23	24	6	
3	Feb/Mar	26	27	28	29	1	2 (H)	5	
4	Mar	4	5	6	7	8 (H)	9	5	8th - Maha Shivaratri
5	Mar	11 (CIE-1)	12 (CIE-1)	13 (CIE-1)	14	15	16 (H)	5	11th, 12th & 13th - CIE - 1
6	Mar	18	19	20	21	22	23 (PTM)	6	23rd - PTM
7	Mar/April	25	26	27	28	29 (H)	30 (H)	4	29th - Good Friday
8	April	1	2	3	4 (CIE-2)	5 (CIE-2)	6 (CIE-2)	6	4th, 5th & 6th - CIE - 2
9	April	8	9 (H)	10	11 (H)	12	13 (H)	3	9th - Ugadi, 11th - Khutub -E- Ramzan
10	April	15	16	17	18	19	20 (PTM)	6	20th - PTM
11	April	22	23	24	25	26	27 (H)	5	
12	May	29	30	1 (H)	2	3	4	5	1st - May Day
13	May	6 (CIE-3)	7 (CIE-3)	8 (CIE-3)	9	10 (H)	11 (H) (LWD)	4	6th, 7th & 8th - CIE - 3 10th - Basava Jayanthi

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Theory Examination : 13-05-2024 to 21-05-2024

Internship Viva Voce/Project Viva : 23-05-2024 to 30-05-2024

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 Bommanahalli, Hosur Road  
 Bengaluru-560 068





CHILDREN'S EDUCATION SOCIETY (Regd.)  
 Administrative Office: 1st Phase JP Nagar, Bengaluru – 560 078 ☎: 080-3041 0501 – 502

**THE OXFORD COLLEGE OF ENGINEERING**

(Recognised by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, Accredited by NAAC-A & NBA New Delhi and Recognised by UGC Under Section 2(f) Bommanahalli, Hosur Road, Bangalore –560068. ☎: 080 -30219601/602, Fax: 080 – 25730551/ 30219629 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxford.edu](http://www.theoxford.edu)

**DEPARTMENT OF AIML  
 FOR UG BE – ODD SEMESTER  
 COMMENCEMENT FROM 25-11-2023 to 16-03-2024**

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	sat		
1							25 (Wed)	1	25 <sup>th</sup> – Commencement of the Semester
2	Nov/Dec	27	28	29 (CA)	30(H)	1	2(H)	4	29 <sup>th</sup> – Club Activity  30 <sup>th</sup> – Kannakadasa Jayanthi
3	Dec	4	5	6 (CA)	7	8	9 (Thursday)	6	6 <sup>th</sup> – Club Activity
4	Dec	11	12	13 (CA)	14	15	16(H)	5	13 <sup>th</sup> – Club Activity
5	Dec	18	19	20 (CA)	21	22	23 (Friday)	5	20 <sup>th</sup> – Club Activity
6	Dec	25(H)	26	27 (CA)	28 (CIE 1)	29 (CIE 1)	30 (Monday) (CIE 1)	6	27 <sup>th</sup> – Club Activity  25 <sup>th</sup> Christmas  28- 30 CIE 1
7	Jan-24	1	2	3 (CA)	4	5	6(H)	5	3 <sup>rd</sup> – Club Activity
8	Jan	8	9	10 (CA)	11	12	13 (Tuesday)	5	10 <sup>th</sup> – Club Activity
9	Jan	15(H)	16	17 (CA) Cisco networking	18	19	20(H)	6	15 <sup>th</sup> - Makara Sankranti 17 <sup>th</sup> -- Cisco networking And Infrastructure
10	Jan	22	23 (OA)	24 (CA)	25	26(H)	27 (Wed)	4	24 <sup>th</sup> – Club Activity 23 <sup>rd</sup> - Samarthanam Trust for the disabled

11	Jan/Feb	29 (Power BI) (CIE-2)	30 (CIE-2)	31 (CA) (CIE-2)	1 (CIE-2)	2 (OA)	3(H)	5	31 <sup>st</sup> – Club Activity 26 <sup>th</sup> – Republic Day 2 <sup>rd</sup> Fostering Creativity and Collaboration
13	Feb	5	6	7 (CA)	8	9	10 (Thursday) (AI,ChatGPT)	6	7 <sup>th</sup> – Club Activity 10 <sup>th</sup> AI, Neural Network and ChatGPT - Hands-on
14	Feb	12	13	14 (CA)	15	16 Depths of AI and Machine Learning	17(H)	5	14 <sup>th</sup> – Club Activity 16 <sup>th</sup> Depths of AI and Machine Learning
15	Feb	19	20	21 (CA)	22	23 Insights and challenges of a Software Professional	24 (Friday)	6	21 <sup>st</sup> – Club Activity 23 <sup>rd</sup> Insights and challenges of a Software Professional
16	Feb/ Mar	26	27	28 (CA)	29	1 Cloud Computing	6(H)	5	28 <sup>th</sup> – Club Activity 1 <sup>st</sup> Cloud Computing - Research Perspective
17	Mar	4	5	6 (CA)	7	8(H)	9( Monday)	6	6 <sup>th</sup> – Club Activity
18	Mar	11 (CIE 3)	12 (CIE 3)	13 (CIE 3)	14 (CIE 3)	15	16 (LWD)	6	11- 16 CIE III

  
 HEAD OF THE DEPARTMENT  
 DEPARTMENT OF AIML  
 OXFORD COLLEGE OF ENGINEERING  
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Children's Education Society ®  
**THE OXFORD COLLEGE OF ENGINEERING**  
 Hosur Road, Bommanahalli, Bengaluru - 560 068

**TENTATIVE CALENDAR OF EVENTS FOR EVEN SEMESTER - 2023-24  
 FOR UG BE - 4TH SEMESTER**

**COMMENCEMENT FROM 22-04-2024 to 07-08-2024**

Sl.No	Month	DAYS						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April	22 (FWD)	23	24	25	26	27	6	22nd - First Working Day
2	April/May	29	30	1(II)	2	3	4 (II)	4	1st - May Day
3	May	6	7	8	9	10(II)	11	5	10th - Basava Jayanthi
4	June	13	14	15	16	17	18 (II)	5	
5	July	20	21	22	23	24	25	6	
6	May/June	27	28	29	30	31	1 (II)	5	
7	June	3	4	5	6	7	8	6	
8	June	10 (CIE-1)	11 (CIE-1)	12 (CIE-1)	13	14	15 (H)	5	10th to 12th CIE - 1
9	June	17 (II)	18	19	20	21	22 (PTM)	5	17th - Bakrid 22nd - PTM
10	June	24	25	26	27	28	29	6	
11	July	1	2	3	4	5	6 (II)	5	
12	July	8	9	10	11	12	13	6	
13	July	15	16	17 (II)	18	19	20 (II)	4	17th - Last Day of Moharam
14	July	22	23	24	25	26	27	6	
15	July/Aug	29 (CIE-2)	30 (CIE-2)	31 (CIE-2)	1	2	3 (H)	5	29th to 31st - CIE - 2
16	Aug	5	6	7 (LWD)	-	-	-	3	7th - Last Working Day
Commencement of Practicals from 08-08-2024 to 17-08-2024								82	
Commencement of Theory Exams from 19-08-2024 to 12-09-2024									
Commencement of next semester 16-09-2024									

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## DEPARTMENT OF BIOTECHNOLOGY

**Academic year: 2023-24 (EVEN)**

### **Department Academic Calendar**

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April/May	27 (FWD)	30	1(H)	2	3	4(H)	4	27th – FWD for 4 <sup>th</sup> Sem 27 <sup>th</sup> -DAC even
2	MAY	6	7	8	9	10	11	5	10 <sup>th</sup> Basava jayanthi 6 <sup>th</sup> to 16 <sup>th</sup> May- Value added course
3	MAY	12	13	14	15	16	17(H)	5	
4	MAY	20	21	22	23	24	25	6	22 <sup>nd</sup> may One day Workshop
5	MAY/JUNE	27	28	29	30	31	1(H)	5	28 <sup>th</sup> may industrial visit.
6	JUNE	3(CIE 1)	4 (CIE1)	5 (CIE 1)	6	7	8(PTM)	6	3 <sup>rd</sup> to 5 <sup>th</sup> CIE1 8 <sup>th</sup> -PTM
7	JUNE	10	11	12(H)	13	14	15(H)	5	13 <sup>th</sup> june one day workshop.
8	JUNE	17(H)	18	19	20	11(H)	12(H)	5	17 <sup>th</sup> -Bakrid
9	JUNE	24	25	26	27	28	29	6	
10	JULY	1	2	3(CIE 2)	4 (CIE2)	5 (CIE 2)	6(H)	5	3 <sup>rd</sup> to 5 <sup>th</sup> -CIE2
11	JULY	8	9	10	11	12	13	6	
12	JULY	15	16	17(H)	18	19	20(H)	4	17 <sup>th</sup> -Bakrid
13	JULY	22	23	24	25 (CIE 3)	26 (CIE 3)	27 (CIE 3)	6	25 <sup>th</sup> to 27 <sup>th</sup> -CIE-3
14	Nov	29	30	31(LWD)				3	31 <sup>st</sup> -last working day

HOD

Dr. B.K MANJUNATHA

Professor & Head

Department of Biotechnology

The Oxford College of Engineering

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## DEPARTMENT OF BIOTECHNOLOGY

**Academic year: 2023-24 (ODD)**

### Department Academic Calendar

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	Aug	19 (FWD)	20	21	22	23	24	6	25 <sup>th</sup> – FWD for 4 <sup>th</sup> Sem 29 <sup>th</sup> – DAC Meeting
2	Aug	26	27	28	29	30	31	6	
3	sep	2	3	4	5	6	7(H)	5	7 <sup>TH</sup> vinayaka churthui
4	Sep9	10	11	12	13	14	6	6	
5	sep	16(H)	17	18	19	20	21(H)4	4	16 <sup>th</sup> eid milad
6	Sep	23	24	25	26	27	28	6	23 <sup>th</sup> – 28 <sup>th</sup> Value added course (VAC)
7	Sep/oct	30	1	2(H)	3	4	5(H)	4	2 <sup>nd</sup> gandhi jayanthi
8	oct	7	8	9	10	11(H)	12(H)	4	11 <sup>th</sup> auyudha pooja
9	oct	14	15	16	17(H)	18	19(H)	4	17 <sup>th</sup> valmiki jayanthi
10	oct	21(CIE 1)	22 (CIE2)	23 (CIE 3)	24	25	26	6	21-23 CIE 1
11	Oct/nov	28	29	30	31(H)	1(H)	2(H)	3	31 <sup>st</sup> naraka chaturdashi 1 <sup>st</sup> kannada rajyotsava 2 <sup>nd</sup> deepavali
12	Nov	4	5	6	7	8	9	6	
13	Nov	11	12	13	14	15	16(H)	5	
14	Nov	18(H)	19	20	21	22	23	5	18 <sup>th</sup> kanakadasa jayanthi
15	Dec	25	26	27	28	29	30	6	
16	Dec	2	3	4	5	6	7(H)	5	
17	Dec	9	10	11	12 (CIE 2)	13 (CIE 2)	14 (CIE 2)	6	12 <sup>TH</sup> . 13 <sup>TH</sup> , 14 <sup>TH</sup> CIE 2
18	Dec	16	17	18	19	20	21(LWD)	5	21 <sup>ST</sup> LWD

  
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**Dr. B.K. MANJUNATHA**  
 Professor & Head  
 Department of Biotechnology  
 The Oxford College of Engineering  
 Bengaluru-560 068.



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## DEPARTMENT OF CIVIL ENGINEERING

**Academic year: 2023-24 (ODD)**

### Department Academic Calendar

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	Aug	19 (FWD)	20	21	22	23	24	6	22 <sup>nd</sup> – FWD for 4 <sup>th</sup> Sem 27 <sup>th</sup> – DAC Meeting
2	Aug	26	27	28	29	30	31	6	
3	sep	2	3	4	5	6	7(H)	5	7 <sup>th</sup> vinayaka churthui
4	Sep9	10	11	12	13	14	6	6	
5	sep	16(H)	17	18	19	20	21(H)4	4	16 <sup>th</sup> eid milad
6	Sep	23	24	25	26	27	28	6	23 <sup>th</sup> – 28 <sup>th</sup> Value added course (VAC)
7	Sep/oct	30	1	2(H)	3	4	5(H)	4	2 <sup>nd</sup> gandhi jayanthi
8	oct	7	8	9	10	11(H)	12(H)	4	11 <sup>th</sup> auyudha pooja
9	oct	14	15	16	17(H)	18	19(H)	4	17 <sup>th</sup> valmiki jayanthi
10	oct	21(CIE 1)	22 (CIE2)	23 (CIE 3)	24	25	26	6	21-23 CIE 1
11	Oct/nov	28	29	30	31(H)	1(H)	2(H)	3	31 <sup>st</sup> naraka chaturdashi 1 <sup>st</sup> kannada rajyotsava 2 <sup>nd</sup> deepavali
12	Nov	4	5	6	7	8	9	6	
13	Nov	11	12	13	14	15	16(H)	5	
14	Nov	18(H)	19	20	21	22	23	5	18 <sup>th</sup> kanakadasa jayanthi
15	Dec	25	26	27	28	29	30	6	
16	Dec	2	3	4	5	6	7(H)	5	
17	Dec	9	10	11	12 (CIE 2)	13 (CIE 2)	14 (CIE 2)	6	12 <sup>TH</sup> . 13 <sup>TH</sup> , 14 <sup>TH</sup> CIE 2
18	Dec	16	17	18	19	20	21(LWD)	5	21 <sup>ST</sup> LWD

  
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 Department of Civil Engineering  
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## DEPARTMENT OF CIVIL ENGINEERING

**Academic year: 2023-24 (EVEN)**

### Department Academic Calendar

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April	22 FWD	23	24	25	26 (H)	27 DAC	5	22 <sup>nd</sup> – FWD for 4 <sup>th</sup> Sem 27 <sup>th</sup> – DAC Meeting
2	April / May	29 FWD	30	1 (H)	2	3	4 (H)	4	1 <sup>st</sup> – May Day 29 <sup>th</sup> – FWD for 6 <sup>th</sup> sem
3	May	6	7	8	9	10 (H)	11 W	5	10 <sup>th</sup> – Basava Jayanthi 11 <sup>th</sup> – Workshop (W)
4	May	13	14	15 (OA)	16	17	18 (H)	5	15 <sup>th</sup> – Outreach Activity (OA)
5	May	20	21	22	23 CM	24	25 GL	6	23 <sup>rd</sup> – Class Committee Meeting 25 <sup>th</sup> – Guest Lecture (GL)
6	May/ June	27	28	29	30 DM	31	1 (H)	5	DM-Department meeting
7	June	3 CIE1	4 CIE1	5 CIE1	6	7	8 PTM	6	3 <sup>rd</sup> – 5 <sup>th</sup> – CIE 1 for 6 <sup>th</sup> Sem 8 <sup>th</sup> – PTM for CIE 1 for 6 <sup>th</sup> sem
8	June	10 CIE1	11 CIE1	12 CIE1	13	14	15 (H)	5	10 <sup>th</sup> – 12 <sup>th</sup> – CIE 1 for 4 <sup>th</sup> Sem
9	June	17 (H)	18	19	20	21	22 PTM W	5	17 <sup>th</sup> – Bakrid 22 <sup>nd</sup> – PTM for CIE 1 for 4 <sup>th</sup> Sem 22 <sup>nd</sup> - Workshop
10	June	24	25	26	27 GL	28 OA	29 CM	6	29 <sup>th</sup> – Class Committee Meeting 28 <sup>th</sup> – Outreach Activity (OA) 27 <sup>th</sup> – Guest Lecture (GL)
11	July	1	2	3 CIE2	4 CIE2	5 CIE2	6 (H)	5	3 <sup>rd</sup> – 5 <sup>th</sup> – CIE 2 for 6 <sup>th</sup> Sem
12	July	8	9	10	11 (SD)	12 (SD)	13 PTM	6	13 <sup>th</sup> PTM for CIE 2 for 6 <sup>th</sup> Sem 11 <sup>th</sup> & 12 <sup>th</sup> – Skill Development Programme (SD)
13	July	15	16	17 (H)	18	19 CM	20 (H)	4	17 <sup>th</sup> – Last day of Moharam 19 <sup>th</sup> – Class Committee Meeting
14	July	22	23	24	25 CIE3	26 CIE3	27 CIE3	6	25 <sup>th</sup> – 27 <sup>th</sup> – CIE 3 for 6 <sup>th</sup> Sem
15	July/Aug	29 CIE2	30 CIE2	31 CIE2 LWD	1	2 DM	3 (H)	5	29 <sup>th</sup> – 31 <sup>st</sup> – CIE 2 4 <sup>th</sup> Sem 31 <sup>st</sup> – LWD for 6 <sup>th</sup> Sem 2 <sup>nd</sup> - Demo Day (DM)
16	Aug	5	6	7 LWD PTM	-	-	-	3	7 <sup>th</sup> – LWD for 4 <sup>th</sup> Sem 7 <sup>th</sup> – PTM for 4 <sup>th</sup> & 6 <sup>th</sup> Sem



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## DEPARTMENT OF CIVIL ENGINEERING

**Academic year: 2023-24 (EVEN)**

### **Department Academic Calendar**

S.No	Activities	Target	Tentative Dates
1	Industrial Visit	1	July 2024
2	Outreach Activity	2	30/05/2024 28/06/2024
3	Skill Development Programme	1	11/07/2024 & 12/07/2024
4	Workshops	2	11/05/2024 22/06/2024
5	Guest Lecture	2	25/05/2024 27/06/2024
6	Demo Day / Poster Presentation	1	02/08/2024

  
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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**Academic year: 2023-24 (EVEN)**

### Department Academic Calendar

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April/May	27 (FWD)	30	1(H)	2	3	4(H)	4	27th – FWD for 4 <sup>th</sup> Sem 2 <sup>nd</sup> to 13 <sup>th</sup> May- Value added course 27 <sup>th</sup> -DAC even
2	MAY	6	7	8	9	10	11	5	10 <sup>th</sup> Basava jayanthi
3	JUNE	22	13	14	15	16	17(H)	5	
4	JULY	20	21	22	23	24	25	6	
5	MAY/JUNE	27	28	29	30	31	1(H)	5	
6	JUNE	3(CIE 1)	4 (CIE1)	5 (CIE 1)	6	7	8(PTM)	6	3 <sup>rd</sup> to 5 <sup>th</sup> CIE1 8 <sup>th</sup> -PTM
7	JUNE	10	11	12(H)	13	14	15(H)	5	
8	JUNE	17(H)	18	19	20	11(H)	12(H)	5	17 <sup>th</sup> -Bakrid
9	JUNE	24	25	26	27	28	29	6	
10	JULY	1	2	3(CIE 2)	4 (CIE2)	5 (CIE 2)	6(H)	5	3 <sup>rd</sup> to 5 <sup>th</sup> -CIE2
11	JULY	8	9	10	11	12	13	6	
12	JULY	15	16	17(H)	18	19	20(H)	4	17 <sup>th</sup> -Bakrid
13	JULY	22	23	24	25 (CIE 3)	26 (CIE 3)	27 (CIE 3)	6	25 <sup>th</sup> to 27 <sup>th</sup> -CIE-3
14	Nov	29	30	31(LWD)				3	31 <sup>st</sup> -last working day

ECE / HOD



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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**Academic year: 2023-24 (ODD)**

### Department Academic Calendar

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	Aug	19 (FWD)	20	21	22	23	24	6	22 <sup>nd</sup> – FWD for 4 <sup>th</sup> Sem
2	Aug	26	27	28	29	30	31	6	
3	sep	2	3	4	5	6	7(H)	5	7 <sup>TH</sup> vinayaka churthui
4	Sep9	10	11	12	13	14	6	6	
5	sep	16(H)	17	18	19	20	21	4	16 <sup>th</sup> eid milad
6	Sep	23	24	25	26	27	28	6	
7	Sep/oct	30	1	2(H)	3	4	5(H)	4	2 <sup>nd</sup> ghandhi jayanthi
8	oct	7	8	9	10	11(H)	12(H)	4	11 <sup>tH</sup> and 12 <sup>th</sup> auyudha pooja
9	oct	14	15	16	17(H)	18	19(H)	4	17 <sup>th</sup> valmiki jayanthi
10	oct	21(CIE 1)	22 (CIE1)	23 (CIE 1)	24	25	26	6	21-23 CIE 1
11	Oct/nov	28	29	30	31(H)	1(H)	2(H)	3	31 <sup>st</sup> naraka chaturdashi 1 <sup>st</sup> kannada rajyotsava 2 <sup>nd</sup> deepavali
12	Nov	4	5	6	7	8	9	6	
13	Nov	11	12	13	14	15	16(H)	5	
14	Nov	18(H)	19	20	21	22	23	5	18 <sup>th</sup> kanakadasa jayanthi
15	Dec	25	26	27	28	29	30	6	
16	Dec	2	3	4	5	6	7(H)	5	
17	Dec	9	10	11	12 (CIE 2)	13 (CIE 2)	14 (CIE 2)	6	12 <sup>TH</sup> . 13 <sup>TH</sup> , 14 <sup>TH</sup> CIE 2
18	Dec	16	17	18	19	20	21(LWD)	5	21 <sup>ST</sup> LWD 20 <sup>th</sup> -DAC meeting

  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**Academic year: 2023-24 (EVEN)**

### **Department Academic Calendar**

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April	22 <b>FWD</b>	23	24	25	26 <b>(H)</b>	27 <b>DAC</b>	5	22 <sup>nd</sup> – FWD for 4 <sup>th</sup> Sem 27 <sup>th</sup> – DAC Meeting
2	April / May	29 <b>FWD</b>	30	1 <b>(H)</b>	2	3	4 <b>(H)</b>	4	1 <sup>st</sup> – May Day 29 <sup>th</sup> – FWD for 6 <sup>th</sup> sem
3	May	6	7	8	9	10 <b>(H)</b>	11 <b>W</b>	5	10 <sup>th</sup> – Basava Jayanthi 11 <sup>th</sup> – Workshop (W)
4	May	13	14	15 <b>(OA)</b>	16	17	18 <b>(H)</b>	5	15 <sup>th</sup> – Outreach Activity (OA)
5	May	20	21	22	23 <b>CM</b>	24	25 <b>GL</b>	6	23 <sup>rd</sup> – Class Committee Meeting 25 <sup>th</sup> – Guest Lecture (GL)
6	May/ June	27 <b>VAC</b>	28 <b>VAC</b>	29 <b>VAC</b>	30 <b>VAC</b>	31 <b>VAC</b>	1 <b>(H)</b>	5	27 <sup>th</sup> – 31 <sup>st</sup> Value added course (VAC)
7	June	3 <b>CIE1</b>	4 <b>CIE1</b>	5 <b>CIE1</b>	6	7	8 <b>PTM</b>	6	3 <sup>rd</sup> – 5 <sup>th</sup> – CIE 1 for 6 <sup>th</sup> Sem 8 <sup>th</sup> – PTM for CIE 1 for 6 <sup>th</sup> sem
8	June	10 <b>CIE1</b>	11 <b>CIE1</b>	12 <b>CIE1</b>	13	14	15 <b>(H)</b>	5	10 <sup>th</sup> – 12 <sup>th</sup> – CIE 1 for 4 <sup>th</sup> Sem
9	June	17 <b>(H)</b>	18	19	20	21	22 <b>PTM</b> <b>W</b>	5	17 <sup>th</sup> – Bakrid 22 <sup>nd</sup> – PTM for CIE 1 for 4 <sup>th</sup> Sem 22 <sup>nd</sup> - Workshop
10	June	24	25	26	27 <b>GL</b>	28 <b>OA</b>	29 <b>CM</b>	6	29 <sup>th</sup> – Class Committee Meeting 28 <sup>th</sup> – Outreach Activity (OA) 27 <sup>th</sup> – Guest Lecture (GL)
11	July	1	2	3 <b>CIE2</b>	4 <b>CIE2</b>	5 <b>CIE2</b>	6 <b>(H)</b>	5	3 <sup>rd</sup> – 5 <sup>th</sup> – CIE 2 for 6 <sup>th</sup> Sem
12	July	8	9	10	11 <b>(SD)</b>	12 <b>(SD)</b>	13 <b>PTM</b>	6	13 <sup>th</sup> PTM for CIE 2 for 6 <sup>th</sup> Sem 11 <sup>th</sup> & 12 <sup>th</sup> – Skill Development Programme (SD)
13	July	15	16	17 <b>(H)</b>	18	19 <b>CM</b>	20 <b>(H)</b>	4	17 <sup>th</sup> – Last day of Moharam 19 <sup>th</sup> – Class Committee Meeting
14	July	22	23	24	25 <b>CIE3</b>	26 <b>CIE3</b>	27 <b>CIE3</b>	6	25 <sup>th</sup> – 27 <sup>th</sup> – CIE 3 for 6 <sup>th</sup> Sem
15	July/Aug	29 <b>CIE2</b>	30 <b>CIE2</b>	31 <b>CIE2</b> <b>LWD</b>	1	2 <b>DM</b>	3 <b>(H)</b>	5	29 <sup>th</sup> – 31 <sup>st</sup> – CIE 2 4 <sup>th</sup> Sem 31 <sup>st</sup> – LWD for 6 <sup>th</sup> Sem 2 <sup>nd</sup> - Demo Day (DM)





# THE OXFORD COLLEGE OF ENGINEERING

Hosur Road, Bommanahalli, Bengaluru-560 068

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**Academic year: 2023-24 (EVEN)**

### **Department Academic Calendar**

16	Aug	5	6	7 LWD PTM	-	-	-	3	7 <sup>th</sup> – LWD for 4 <sup>th</sup> Sem 7 <sup>th</sup> – PTM for 4 <sup>th</sup> & 6 <sup>th</sup> Sem
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*Jc*  
*Quin*  
Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bengaluru-560 068



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Bommanahalli, Hosur Road, Bangalore -560068.

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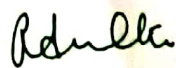
## PG DEPARTMENT OF MBA & MCA

### CALENDAR OF EVENTS FOR EVEN SEMESTER- 2023-24

#### FOR PG 2<sup>nd</sup> SEMESTER MBA PROGRAMME

Sl No	Month	Day						No. of working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	July	15(FWD)	16	17(H)	18	19	20(H)	4	First Working Day Last Day of Moharam Placement Training
2	July	22	23	24	25	26	27	6	Industrial Visit Placement Training
3	July/ Aug	29	30	31	1	2	3(H)	5	Industrial Visit Guest Lecture in Human Resource Management
4	August	5	6	7	8	9	10	6	Guest Lecture in Financial Management Visit to ISKCON
5	August	12	13	14	15(H)	16	17(H)	4	Independence Day Guest Lecture in Research Methodology And IPR Ramakrishna Ashram Visit
6	August	19	20 CIE 1	21 CIE 1	22 CIE 1	23 (Fest)	24 (Fest)	6	CIE- Test 1 Management Fest
7	August	26	27	28	29	30	31	6	Guest Lecture in operations Research Blood donation camp
8	Sep	2	3	4	5	6	7(H)	5	Varasiddhi Vinayaka Vratha Plastic-Free Futures: A Community Awareness Initiative
9	Sep	9	10	11	12	13	14	6	Guest Lecture in Strategic Management Orphanage Visit Entrepreneurship Mela
10	Sep	16(H)	17 CIE 2	18 CIE 2	19 CIE 2	20	21 (H)	4	Eid-Milad CIE- Test 2
11	Sep	23	24	25	26	27	28	6	Guest Lecture in Managerial Economics Health awareness camp
12	Sep/Oct	30	1	2(H)	3	4	5(H)	4	Gandhi Jayanthi Old Age Home visit
13	Oct	7	8	9	10	11(H)	12(H)	4	Ayudha Pooja Vijayadashami
14	Oct	14	15 CIE 3	16 CIE 3	17(H)	18 CIE 3	19(LWD)	4	Maharshi Valmiki Jayanthi CIE- Test 3

2 <sup>nd</sup> Semester VTU Theory Examinations	22.10.2024 To 20.11.2024
Commencement of 3 <sup>rd</sup> Semester	25.11.2024

  
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**CALENDAR OF EVENTS FOR ODD SEMESTER – 2023-24**  
**PG- 3<sup>rd</sup> SEMESTER MBA PROGRAMME**

SL. No	Month	Day						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	December'23					1 (FWD)	2 (H)	1	First Working Day
2	December'23	4	5	6	7	8	9	6	
3	December'23	11	12	13	14	15	16 (H)	5	
4	December'23	18	19	20	21	22	23	6	
5	December'23	25 (H)	26	27	28	29	30	5	Christmas Guest Lecture - Finance Specialization
6	January' 24	1	2	3	4	5	6 (H)	5	
7	January' 24	8 (CIE1)	9 (CIE1)	10 (CIE1)	11	12	13 (PTM)	6	CIE Test-I
8	January' 24	15(H)	16	17	18	19	20 (H)	4	Makar Sankranti
9	January' 24	22	23	24	25	26(H)	27	5	Republic Day National Voter's day
10	Jan/Feb 24	29	30	31	1	2	3 (H)	5	Industrial Visit
11	February' 24	5	6	7	8 (CIE 2)	9 (CIE 2)	10 (CIE 2)	6	
12	February' 24	12	13	14	15	16 (PTM)	17 (H)	5	Union Budget – Student Presentation
13	February' 24	19	20	21	22	23	24	6	International Mother Language Day
14	Feb/March' 24	26	27	28	29	1	2 (H)	5	
15	March' 24	4	5	6 (CIE 3)	7 (CIE 3)	8 (H)	9 (CIE 3)	5	Maha Shivaratri
16	March' 24	11	12 (PTM)	13 (LWD)				3	Last working Day

VTU Theory Exam	18.03.2024 to 17.04.2024
Project work	18.04.2024 to 01.06.2024
Commencement of Even Semester	03.06.2024

*[Signature]*  
 HOD, Dept. of Business Administration  
 The Oxford College of Engineering  
 Bommanahalli, Hosur Road  
 Bangalore 560 068

*[Signature]*  
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 The Oxford College of Engineering  
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**CALENDAR OF EVENTS FOR ODD SEMESTER – 2023-24**

**PG – 1<sup>st</sup> SEMESTER MBA PROGRAMME**

SL. No	Month	Day						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	February'24	12 (FWD)	13	14	15	16	17(H)	5	FWD-First Working Day
2	February'24	19	20	21	22	23	24	6	24- Mon TT,
3	February'24	26	27	28	29	1	2(H)	5	
4	Feb/ March'24	4	5	6	7	8(H)	9	5	09- Tues TT H- Maha Shivaratri
5	March'24	11	12	13 (CIE1)	14 (CIE1)	15 (CIE1)	16(H)	5	CIE- 1
6	March'24	18	19	20	21	22	23 (PTM)	6	23-Wed TT PTM-Parents Teachers Meeting
7	March'24	25	26	27	28	29(H)	30	5	30-Thu TT, H-Good Friday
8	April'24	1	2	3	4	5	6(H)	5	
9	April'24	8	9(H)	10	11(H)	12	13	4	13-Fri TT, H-Ugadi Festival H-E-Ramzan
10	April'24	15	16 (CIE2)	17 (CIE2)	18 (CIE2)	19	20(H)	5	CIE- 2
11	April'24	22	23	24	25	26	27 (PTM)	6	27-Mon TT PTM-Parents Teachers Meeting
12	April/ May'24	29	30	1(H)	2	3	4(H)	4	H-May Day
13	May'24	6	7	8	9	10(H)	11	5	11-Tue TT H- Basava Jayanthi
14	May'24	13	14	15	16	17	18(H)	5	
15	May'24	20	21	22	23	24	25	6	25-Wed TT
16	May/June'24	27	28	29	30	31	1(H)	5	H-Holiday
17	June'24	3 (CIE3)	4 (CIE3)	5 (CIE3)	6	7	8 (LWD)	5	CIE – 3 LWD-Last Working Day

<b>VTU Theory Exam</b>	<b>18-06-24 To 05-07-24</b>
<b>Commencement of even semester</b>	<b>15-07-24</b>

  
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**CALENDAR OF EVENTS FOR EVEN SEMESTER – 2023-24**  
**FOR PG - 4<sup>TH</sup> SEMESTER MBA PROGRAMME**

Sl. No	Month	Day						No. of working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	June	10 (FWD)	11	12	13	14	15 (H)	5	First Working Day Orientation Program for 4 <sup>th</sup> Semester students
2	June	17 (H)	18	19	20	21	22	5	Bakrid;
3	June	24	25	26	27	28	29	5	International Yoga Day
4	July	1	2	3	4	5	6 (H)	6	
5	July	8	9	10	11	12	13	5	5 day Virtual Workshop International Anti-Drugs Day Webinar on "International Business"
6	July	15	16 CIE 1	17 (H)	18 CIE 1	19 CIE 1	20 (H)	5	Last day of Moharam CIE- Test 1
7	July	22	23	24	25	26	27	5	Outreach Program Seminar/Guest Lecture Industrial Visit
8	July/ Aug	29	30	31	1	2	3(H)	6	Guest Lecture in "Strategic brand Management"
9	August	5	6	7	8	9	10	5	Guest Lecture in "IMC"
10	August	12	13	14	15(H)	16	17(H)	5	Independence Day
11	August	19 CIE 2	20 CIE 2	21 CIE 2	22	23 (Fest)	24 (Fest)	5	CIE- Test 2 Management Fest
12	August	26	27	28	29	30	31(H)	6	Guest Lecture – HR specialization Independence Day
13	Sep	2	3	4	5	6	7 (H)	5	Varasiddhi Vinayaka Vratha Guest Lecture In Finance Specialization
14	Sep	9	10	11	12	13	14	6	Guest Lecture in Innovation & Design Thinking
15	Sep	16 (H)	17	18	19	20	21	4	Eid-Milad Expert Lecture In Corporate Restructuring
16	Sep	23 CIE 3	24 CIE 3	25 CIE 3	26	27	28 (LWD)	6	Last Working Day

Submission of 4 <sup>th</sup> Semester Projects	13.09.2024 to 28.09.2024
4 <sup>th</sup> Semester VTU Theory Examinatons	30.09.2024 to 06.11.2024

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**CALENDAR OF EVENTS FOR EVEN SEMESTER FOR 4th Sem MCA (2023-2024)**

SLNo	Month	Day						No of Working	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	APRIL	22(FW D)	23	24	25	26	27	5	First Working Day
2	APRIL	29	30	1(H)	2	3	4(H)	4	H-May Day
3	MAY	6	7	8	9	10(H)	11	5	H-Basava Jayanthi
4	MAY	13	14	15	16	17	18(H)	5	
5	MAY	20	21	22	23	24	25	6	
6	MAY/JUNE	27	28	29	30	31	1(H)	5	
7	JUNE	3	4(CIE1)	5(CIE1)	6	7	8	6	CIE1-TEST
8	JUNE	10	11	12	13	14	15(H)	5	
9	JUNE	17(H)	18	19	20	21(CIE 2)	22(CIE 2)	5	H-Bakrid ,CIE-2
10	JUNE	24	25	26	27	28	29	6	
11	JULY	1	2	3	4	5	6(H)	5	Bakrid
12	JULY	8	9	10	11	12	13	6	
13	JULY	15	16	17(H)	18	19	20(H)	4	H-Last Day of
14	JULY	22	23	24	25(CIE 3)	26(CIE 3)	27(LW D)	6	Last Working Day , CIE3
VTU Practical Exam		28-07-2024 TO 29-07-2024							
VTU Theory Exam		01-08-2024 TO 23-08-2024							
Submission of the reports to VTU		13-7-2024 TO 27-07-2024							

  
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### CALENDAR OF EVENTS FOR EVEN SEMESTER FOR 2nd Sem MCA (2023-2024)

SLNo	Month	Day						No of Working	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	JULY	15 (FWD)	16	17(H)	18	19	20(H)	4	17th Last day of Moharam
2	JULY	22	23	24	25	26	27	6	
3	JULY/AUG	29	30	31	1	2	3(H)	5	
4	AUG	5	6	7	8	9	10	6	
5	AUG	12		14	15(H)	16	17(H)	4	15th
6	AUG	19	20	21	22(1CI E)	23(1CI E)	24(1CI E)	6	CIE1 22,23,24
7	AUG	26	27	28	29	30	31	6	
8	SEPT	2	3	4	5	6	7(H)	5	7th Vinayaka
9	SEPT	9	10	11	12	13	14	6	
10	SEPT	16(H)	17	18	19	20	21(H)	4	16th Eid Milad
11	SEPT	23(2CI E)	24(2CI E)	25(2CI E)	26	27	28	6	CIE2 23,24,25
12	SEPT/OCT	30	1	2(H)	3	4	5(H)	4	2nd Gandhi Jayanthi
13	OCT	7	8	9	10	11(H)	12(H)	4	11th & 12th
14	OCT	14(3CI E)	15(3CI E)	16(3CI E)	17(H)	18		4	17th Valmaki Jayanthi CIE3 14,15,16
VTU Practical Exam		21-10-2024 To 26-10-2024							
VTU Theory Exam		28-10-2024 To 16-11-2024							

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The Head

Department of MCA

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**CALENDAR OF EVENTS FOR ODD SEMESTER FOR 3 Sem MCA (2023-2024)**

**Master of Computer Applications**

SLNo	Month	Day						No of Working	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	Dec	11(FWD)	12	13	14	15	16(H)	5	FWD: First Working Day H-Week of Holiday
2	Dec	18	19	20	21	22	23	6	23-Monday TT 18,19,30 Work Shop on Advanced Spring Boot
3	Dec	25(H)	26	27	28	29	30	5	H-Christmas Holiday
4	Jan	1	2	3	4	5	6(H)	5	H-Week of Holiday
5	Jan	8	9	10	11(CIE1)	12(CIE1)	13(CIE1)	6	13-Tuesday TT CIE-1-11,12,13
6	Jan	15(H)	16	17	18(PTM)	19(IV)	20(H)	4	H-Makara Sankranti 18 PTM: Parent & Teacher Meeting 19th Industry Visit
7	Jan	22	23	24	25	26(H)	27	5	H-Republic Day 27-Wed TT
8	Jan/Feb	29	30	31	1	2(GL)	3(H)	5	2nd Guest Lecturer
9	Feb	5	6	7	8	9	10	6	10- Thu TT
10	Feb	12(CIE2)	13(CIE2)	14(CIE2)	15	16	17(H)	5	CIE2-12,13,14
11	Feb	19	20	21	22	23	24(PTM)	6	24- Fri TT, PTM Parent Teacher Meeting
12	Feb/Mar	26	27	28	29	1(TS)	2(H)	5	1st Technical Seminar II-Holiday
13	Feb	4	5	6	7	8(H)	9	5	10- Monday TT H- Maha Shivaratri
14	Feb/Mar	11	12	13	14	15(GL)	16(H)	5	16th Guest Lecturer
15	Mar	18(CIE3)	19(CIE3)	20(CIE3)	21	22	23(LWD)	6	24- Tue TT CIE3-18,19,20 LWD Last Working Day

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VTU Practical Exam 25-03-24 TO 30-03-24  
 VTU Theory Exam 01-04-24 TO 18-04-24

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**CALENDAR OF EVENTS FOR ODD SEMESTER FOR 1 Sem MCA (2023-2024)**

SLNo	Month	Day						No of Working	Activities	
		Mon	Tue	Wed	Thu	Fri	Sat			
1	Feb	12(FWD)	13	14	15	16	17(H)	5	FWD-First Working Day	
2	Feb	19	20	21	22	23	24	6	24- Mon TT,	
3	Feb/Mar	26	27	28	29	1(TS)	2(H)	5	1st Technical Seminar II-Holiday	
4	Mar	4	5	6	7	8(H)	9	5	09- Tues TT Maha Shivaratri H-	
5	Feb/Mar	11	12(CIE1)	13(CIE1)	14(CIE1)	15(CIE1)	16(H)	5	CIE-1-12,13,14,15	
6	Mar	18	19	20	21	22	23(PTM)	6	23-Wed TT Parents Teachers Meeting PTM-	
7	Mar	25	26	27	28	29(H)	30	6	30-Thu TT, H-Good Friday	
8	April	1	2	3	4	5	6(H)	5		
9	April	8	9(H)	10	11(H)	12	13	4	13-Fri TT, H-Ugadi Festival H-E-Ramzan	
10	April	15	16(CIE2)	17(CIE2)	18(CIE2)	19(CIE2)	20(H)	5	CIE2-16,17,18,19	
11	April	22	23	24	25	26	27(PTM)	6	27-Mon TT PTM-Parents Teachers Meeting	
12	April/May	29	30	1(H)	2	3	4(H)	4	H-May Day	
13	May	6	7	8	9	10(H)	11	5	11-Tue TT H-Basava Jayanthi	
14	May	13	14	15	16	17	18(H)	5		
15	May	20	21	22	23	24	25(LWD)	6	LWD-Last Working Day 25-Wed TT CIE3-20,21,22,23	
16	May/June	27	28	29	30	31	1(H)	5	H=Holiday	
17	June	3(CIE3)	4(CIE3)	5(CIE3)	6(CIE3)	7	8(LWD)	6	CIE-3 LWD-Last Working Day	
Total Working Days								78		
VTU Practical Exam				10-06-24 TO 15-06-24						
VTU Theory Exam				18-06-24 TO 05-07-24						

for Dh  
21/5/24  
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R. S. S. S.  
Director MBA & MCA

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## DEPARTMENT OF MECHANICAL ENGINEERING

**Academic year: 2023-24 (ODD)**

### **Department Academic Calendar**

Sl.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	Sep	11 (FWD)	12	13	14	15	16(H)	4	11 <sup>TH</sup> First Working Day for 7 <sup>th</sup> sem
2	Sep	18 (H)	19	20	21	22	23	5	18 <sup>th</sup> Ganesha Chaturthi
3	Sep	25	26	27	28 (H)	29	30(H)	4	28 <sup>th</sup> Eid milad
4	Oct	2 (H)	3	4	5	6	7 (H)	4	2 <sup>nd</sup> Gandhi jayanthi 25 <sup>th</sup> – Outreach
5	Oct	9	10	11	12	13	14 (H)	5	14 <sup>th</sup> Mahalaya Amavasya
6	Oct	16 (CIE-1)	17 (CIE-1)	18 (CIE-1)	19	20 (PTM)	21 (H)	5	16 <sup>th</sup> , 17 <sup>th</sup> , 18 <sup>th</sup> CIE-1 & 20 <sup>th</sup> PTM
7	Oct	23 (H)	24 (H)	25	26	27	28 (H)	3	23 <sup>rd</sup> Auyudha pooja 24 <sup>th</sup> Vijayadashami 28 <sup>th</sup> Valmiki jayanthi
8	Oct/Nov	30	31	1 (H)	2	3	4 (H)	4	1 <sup>st</sup> Kannada Rajyotsava
9	Nov	6	7	8	9	10	11	6	
10	Nov	13	14 (H)	15	16	17	18 (H)	4	14 <sup>th</sup> Balipadyami, Deepavali
11	Nov	20 (CIE-2)	21 (CIE-2)	22 (CIE-2)	23	24	25 (PTM)	6	20 <sup>th</sup> , 21 <sup>th</sup> , 22 <sup>th</sup> CIE-2 & 25 <sup>th</sup> PTM 23 <sup>rd</sup> – 25 <sup>th</sup> Value Added Program
12	Nov/Dec	27	28	29	30 (H)	1	2 (H)	4	27 <sup>th</sup> – 28 <sup>th</sup> Value Added Program 30 <sup>th</sup> Kanakadasa jayanthi
13	Dec	4	5	6	7	8	9	6	
14	Dec	11	12	13	14	15	16 (H)	5	
15	Dec	18	19	20	21	22	23	6	12 <sup>TH</sup> 13 <sup>TH</sup> , 14 <sup>TH</sup> CIE 2
16	Dec	25 (H)	26	27 (CIE-3)	28 (CIE-3)	29 (CIE-3)	30 (PTM)	5	25 <sup>th</sup> Christmas, 27 <sup>th</sup> , 28 <sup>th</sup> , 29 <sup>th</sup> CIE-3 & 30 <sup>th</sup> PTM
17	Jan-24	1	2	3	4	5	6 (LWD)	5	6 <sup>th</sup> Last Working Day

G.P.Reddy

PROFESSOR & HEAD  
DEPARTMENT OF MECHANICAL ENGINEERING  
THE OXFORD COLLEGE OF ENGINEERING  
BOMMANAHALLI, BANGALORE-560068



# THE OXFORD COLLEGE OF ENGINEERING

Hosur Road, Bommanahalli, Bengaluru-560 068

(Approved by AICTE, New Delhi, Accredited by NAAC, New Delhi & Affiliated to VTU, Belgaum)

## DEPARTMENT OF MECHANICAL ENGINEERING

**Academic year: 2023-24 (EVEN)**

**Department Academic Calendar**

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April / May	29 (FWD)	30	1(H)	2	3	4(H)	4	27th – FWD for 4 <sup>th</sup> Sem 3 <sup>RD</sup> -DAC even
2	MAY	6	7	8	9	10	11	5	9 <sup>th</sup> May – Guest Lecture 10 <sup>th</sup> Basava jayanthi
3	JUNE	13	14	15	16	17	18(H)	5	14 <sup>th</sup> May – Guest Lecture
4	JULY	20	21	22	23	24	25	6	
5	MAY / JUNE	27	28	29	30	31	1(H)	5	
6	JUNE	3 (CIE 1)	4 (CIE1)	5 (CIE 1)	6	7	8 (PTM)	6	3 <sup>rd</sup> to 5 <sup>th</sup> CIE1 8 <sup>th</sup> -PTM
7	JUNE	10	11	12(H)	13	14	15(H)	5	
8	JUNE	17(H)	18	19	20	11(H)	12(H)	5	19 <sup>th</sup> June – Guest Lecture 17 <sup>th</sup> -Bakrid
9	JUNE	24	25	26	27	28	29	6	
10	JULY	1	2	3 (CIE 2)	4 (CIE2)	5 (CIE 2)	6(H)	5	3 <sup>rd</sup> to 5 <sup>th</sup> -CIE2
11	JULY	8	9	10	11	12	13	6	
12	JULY	15	16	17(H)	18	19	20(H)	4	17 <sup>th</sup> -Bakrid
13	JULY	22	23	24	25 (CIE 3)	26 (CIE 3)	27 (CIE 3)	6	25 <sup>th</sup> to 27 <sup>th</sup> -CIE-3
14	JULY	29	30	31 (LWD)				3	31 <sup>st</sup> -last working day

*G.N.Reddy*

PROFESSOR & HEAD  
DEPARTMENT OF MECHANICAL ENGINEERING  
THE OXFORD COLLEGE OF ENGINEERING  
BOMMANAHALLI, BANGALORE-560068



CHILDREN'S EDUCATION SOCIETY (Regd.)

Administrative Office:

1<sup>st</sup> Phase, JP Nagar, Bengaluru – 560 078

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E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF MECHATRONICS ENGINEERING

#### Academic year: 2023-24 (EVEN)

#### Department Academic Calendar

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April/May	27 (FWD)	30	1(H)	2	3	4(H)	4	27 <sup>th</sup> – FWD for 4 <sup>th</sup> Sem 27 <sup>th</sup> -DAC even
2	MAY	6	7	8	9	10	11	5	10 <sup>th</sup> Basava jayanthi 6 <sup>th</sup> to 16 <sup>th</sup> May- Value added course
3	MAY	12	13	14	15	16	17(H)	5	
4	MAY	20	21	22	23	24	25	6	22 <sup>nd</sup> may One day Workshop
5	MAY/JUNE	27	28	29	30	31	1(H)	5	28 <sup>th</sup> may industrial visit.
6	JUNE	3(CIE 1)	4 (CIE1)	5 (CIE 1)	6	7	8(PTM)	6	3 <sup>rd</sup> to 5 <sup>th</sup> CIE1 8 <sup>th</sup> -PTM
7	JUNE	10	11	12(H)	13	14	15(H)	5	13 <sup>th</sup> june one day workshop.
8	JUNE	17(H)	18	19	20	11(H)	12(H)	5	17 <sup>th</sup> -Bakrid
9	JUNE	24	25	26	27	28	29	6	
10	JULY	1	2	3(CIE 2)	4 (CIE2)	5 (CIE 2)	6(H)	5	3 <sup>rd</sup> to 5 <sup>th</sup> -CIE2
11	JULY	8	9	10	11	12	13	6	
12	JULY	15	16	17(H)	18	19	20(H)	4	17 <sup>th</sup> -Bakrid
13	JULY	22	23	24	25 (CIE 3)	26 (CIE 3)	27 (CIE 3)	6	25 <sup>th</sup> to 27 <sup>th</sup> -CIE-3
14	Nov	29	30	31(LWD)				3	31 <sup>st</sup> -last working day

  
 HOD / MTE  
 Prof. & HOD  
 Department of Mechatronics  
 The Oxford College Of Engineering  
 Bangalore





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Administrative Office:

1<sup>st</sup> Phase, JP Nagar, Bengaluru – 560 078

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**DEPARTMENT OF MECHATRONICS ENGINEERING**

**Academic year: 2023-24 (ODD)**

**Department Academic Calendar**

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	Aug	19 (FWD)	20	21	22	23	24	6	22 <sup>nd</sup> – FWD for 4 <sup>th</sup> Sem 27 <sup>th</sup> – DAC Meeting
2	Aug	26	27	28	29	30	31	6	
3	sep	2	3	4	5	6	7(H)	5	7 <sup>th</sup> vinayaka churthui
4	Sep9	10	11	12	13	14	6	6	
5	sep	16(H)	17	18	19	20	21(H)4	4	16 <sup>th</sup> eid milad
6	Sep	23	24	25	26	27	28	6	23 <sup>th</sup> – 28 <sup>th</sup> Value added course (VAC)
7	Sep/oct	30	1	2(H)	3	4	5(H)	4	2 <sup>nd</sup> ghandhi jayanthi
8	oct	7	8	9	10	11(H)	12(H)	4	11 <sup>th</sup> auyudha pooja
9	oct	14	15	16	17(H)	18	19(H)	4	17 <sup>th</sup> valmiki jayanthi
10	oct	21(CIE 1)	22 (CIE2)	23 (CIE 3)	24	25	26	6	21-23 CIE 1
11	Oct/nov	28	29	30	31(H)	1(H)	2(H)	3	31 <sup>st</sup> naraka chaturdashi 1 <sup>st</sup> kannada rajyotsava 2 <sup>nd</sup> deepavali
12	Nov	4	5	6	7	8	9	6	
13	Nov	11	12	13	14	15	16(H)	5	
14	Nov	18(H)	19	20	21	22	23	5	18 <sup>th</sup> kanakadasa jayanthi

15	Dec	<b>25</b>	<b>26</b>	<b>27</b>	28	<b>29</b>	30	6	
16	Dec	2	3	<b>4</b>	5	6	7(H)	5	
17	Dec	9	10	<b>11</b>	12 (CIE 2)	13 (CIE 2)	14 (CIE 2)	6	12 <sup>TH</sup> . 13 <sup>TH</sup> , 14 <sup>TH</sup> CIE 2
18	Dec	16	17	<b>18</b>	19	20	21(LWD)	5	21 <sup>ST</sup> LWD

  
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**Prof. & HOD**  
**Department of Mechatronics**  
**The Oxford College Of Engineering**  
Warananasi, Warangal - 506004, India



**THE OXFORD COLLEGE OF ENGINEERING**  
BOMMANAHALLI, HOSUR ROAD, BANGALORE - 560 068

**CALENDAR OF EVENTS FOR SECOND SEMESTER (B.E.) ACADEMIC YEAR 2022-23**

Commencement of Semester : 25.05.2023								Last working day: 09.09.2023	
Month	Week	WORKING DAYS						No. of working days	HOLIDAYS / EVENTS
		MON	TUE	WED	THU	FRI	SAT		
MAY/JUN	1				25	26	27 (H)	2	25-(FWD)
	2	29	30	31	1	2	3	6	
	3	5	6	7	8	9	9 (H)	5	
	4	12	13	14	15	16	17	6	
	5	19	20	21	22	23	24 (H)	5	
JUN/JULY	6	26 (CIE 1)	27 (CIE 1)	28 (CIE 1)	29	30	1	5	26,27&28-First Internals,29-Bakrid
	7	3	4	5	6	7	8(H)	5	
	8	10	11	12	13	14	15	6	15- 1st PTM
	9	17	18	19	20	21	22(H)	5	
	10	24	25	26	27	28	29(H)	5	29- Moharam
JUL/AUG	11	31	1	2 (CIE 2)	3 (CIE 2)	4 (CIE 2)	5(H)	5	2,3&4-Second Internals
	12	7	8	9	10	11	12	6	12th - 2nd PTM
	13	14	15	16	17	18	19(H)	4	15-Independence Day
	14	21	22	23	24	25	26	6	
AUG/SEP	15	28	29	30	31	1	2(H)	5	
	16	4 (CIE 3)	5 (CIE 3)	6 (CIE 3)	7	8	9	6	4,5&6-Third Internals, PTM, 9th LWD
<b>Total Working days in the semester</b>								<b>82</b>	
NOTE	1. Attendance display - 5th of Every Month.      2. 85% attendance is compulsory in each subject.								
	3. Coverage of syllabus : 40% by IA-1, 30% by IA-2 and remaining 30% by IA-3.								
	4. CIE marks for practicals to be evaluated during regular laboratory classes and final lab test to be conducted								
	5. II sem B.E.- Practical exams from 11.09.2023 to 20.09.2023 & Theory exams from 21.09.2023 to 21.10.2023.								
	6. Commencement of Odd semester :25.10.2023								

CC to : All HODs & Staff, Exam Section, Librarian, Placement Officer, Physical Edn. Director & All Notice Boards  
**Professor and Head**  
 Department of Science & Humanities  
 The Oxford College of Engineering  
 Bengaluru-560068

Principal  
**PRINCIPAL**  
 The Oxford College of Engineering  
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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND AMCHINE LEARNING

ACEDMIC TIMETABLE ODD SEM (2023-24)

Sl. no	Days	SEMESTER	WEEK	ROOM NO	CLASS TEACHER	9.00 to 9.55	9.55 to 10.50	S H O R T  B R E A K	11.00 to 11.55	11.55 to 12.50	L U N C H B R E A K	1.30 to 2.25	2.25 to 3.20	3.20 to 4.15							
1	MON	3rd	15/11/23	606	Subaranjani T	OOPJ (SPR)	DS (SP)		Operating Systems Lab B 1/ Digital Design & Computer Organization B 2	MCS (MW)		Data Analytics with Excel B 1 & B2	5th	25/10/23	607	Parvathy S	AJS(SRR) LAB	RM(BM)	EVS(P)	DBMS(SRR)	INTENSHIP
2	TUE	3rd	15/11/23	606	Subaranjani T	MCS (MW)	DD & CO (BM)	OS (PS)	DS (SP)	Social Connect & Responsibility	Mentoring Library	5th	25/10/23	607	Parvathy S	DBMS(SPR)	AI(SR)	ACD(SP)	RM(BM)	DBMS (SRR )Lab B 1/ CN LAB B2	
3	WED	3rd	15/11/23	606	Subaranjani T	OS (PS)	OOPJ (SPR)	DD & CO (BM)	MCS (MW)	DD & CO (BM)	Operating Systems B 2 / Digital Design & Computer Organization B 1	5th	25/10/23	607	Parvathy S			EVS(P)	DBMS(SP R)	CN (SR)	CLUB Activity
4	THU	3rd	15/11/23	606	Subaranjani T	MCS (MW)	DD & CO (BM)	OS (PS)	DS (SP)	Data Structures Lab B 1/ Object Oriented Programming with Java B 2	5th	25/10/23	607	Parvathy S	DBMS(SPR)	CN LAB B1	DBMS (SRR )Lab B 2	AI (SR)	AI (SR)	Library	
5	FRI	3rd	15/11/23	606	Subaranjani T	DS (SP)	OS (PS)	OOPJ (SPR)	MCS (MW)	Data Structures Lab B 1/ Object Oriented Programming											



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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND AMCHINE LEARNING

ACEDEMIC TIMETABLE ODD SEM (2023-24)

												with Java B 2			
		5th	25/10/23	607	Parvathy S										
					AI (SR)	RM(BM)			ACD(SP)					Mentorin g	
6	SAT	Alternate Saturday weekday timetable											Alternate Saturday weekday timetable		

3<sup>rd</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
BCS301	Mathematics for Computer Science (MCS)	Mr. Madhwesha(MW)	MW
BCS302	Digital Design & Computer Organization (DD & CO)	Dr.Bindhu Madhavai/ Ms. Swetha PR (BM/SPR)	SPR
BCS303	Operating Systems (OS)	Mrs.Parvathy.S (PS)	PS
BCS304	Data Structures and Applications (DS)	Ms.Sathiya Priya (SP)	SP
BCSL305	Data Structures Lab(DSL)	Ms.Sathiya Priya (SP)	SP
BCS306A	Object Oriented Programming with Java (OOPJ)	Ms. Swetha PR (SPR)	SPR
BSCK307	Social Connect and Responsibility (SCR)	Ms.Sathya Priya (SP)	SP
BCS358A	Data Analytics with Excel (DAE)	Ms.SubaRanjani (SR)	SR



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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND AMCHINE LEARNING

ACEDEMIC TIMETABLE ODD SEM (2023-24)

5<sup>th</sup> sem faculty names and subjects

<b>SUB CODE</b>	<b>SUBJECT</b>	<b>FACULTY</b>	<b>INITIAL</b>
21CS51	Automata Theory and Compiler Design (ACD)	Prof. Sathiyapriya	SP
21CS52	Computer Networks(CN)	Prof.Subaranjani.T(SR)/	SR
21CS53	Database Management Systems(DBMS)	Prof.Shwetha(SCR)	SCR
21AI54	Principles of Artificial Intelligence (AI)	Prof.Subaranjani.T(SR)	SR
21CSL55	Database Management Systems Laboratory with Mini Project	PARVATHY S	PS
21XX56	Research Methodology &Intellectual Property Rights (RM)	Dr P Bindhu Madhavi(BM)	BM
21CIV57	Environmental Studies (EVS)	Prof.Dr.Pallavi (P)	PV
21CS582	Angular JS	Prof. PARVATHY S	PS





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**DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING-EVEN SEM(2023-24)**

Sl. no	Days	SEMESTER	WEEK	ROOM NO	CLASS TEACHER	9.00 to 9.55	9.55 to 10.50	11.00 to 11.55	11.55 to 12.50	1.30 to 2.25	2.25 to 3.20	3.20 to 4.15	
1	MON	4th	22-04-24	606	Shwetha P R	DBMS (SPR)	DBMSLA B(B1) (SPR)	AI LAB(B2) (SR)	DMS (MC)	Library	AI (ST)	Mentoring	
		6th	29-04-24	607	Rashmi Paruthi	ML (PR)	SEPM	DSA	ML	Project			
2	TUE	4th	22-04-24	606	Shwetha P R	AI (ST)	DMS (MC)	(BFE) (NV)	UHV (SPR)	(DBMS) SPR	ADA (RT)	Sports/Yoga/NSS	
		6th	29-04-24	607	Rashmi Paruthi	DSA (RP)	DSA Lab(b1)	ML Lab(b2)		BI	INTERNSHIP REVIEW	MENTORING	
3	WED	4th	22-04-24	606	Shwetha P R	ADA (RT)	DBMS (SPR)	DBMS LAB (B2) (SPR)/ AI Lab (B1)(NF)		BFE (NV)	Club Activity (CA)		
		6th	29-04-24	607	Rashmi Paruthi	RER (SPR)	DSA	SEPM	ML	BI	CLUB ACTIVITY		
4	THU	4th	22-04-24	606	Shwetha P R	ADA (RP)	DBMS (SPR)	AI (ST)	DMS (MC)	ADA LAB(B1) (RP)/ mongodb Lab (PR1)(B2)			
		6th	29-04-24	607	Rashmi Paruthi	SEPM (BM)	DSA Lab (b2)	ML Lab(b1)		RER	RER	LIBRARY	
5	FRI	4th	22-04-24	606	Shwetha P R	DMS (MC)	ADA (RP)	AI (ST)	BFE (NV)	ADA LAB(B2) (RP)/mongodb Lab(PR1) (B1)			
		6th	29-04-24	607	Rashmi Paruthi	ML	RER	DSA	SEPM	BI	BI	NSS/P E/YOGA	
6	SAT	Alternate Saturday weekday timetable							Alternate Saturday weekday timetable				



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4<sup>th</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
BAI401	Analysis & Design of Algorithms (ADA)	Ms. Rashmi Paruti (RP)	RP
BAI402	Artificial Intelligence (AI)	Ms. Subaranjini T (ST)	ST
BAI403	Database Management Systems (DBMS)	Ms. Shwetha P R (SPR)	SPR
BAIL404	Analysis & Design of Algorithms Lab (ADAL)	Ms. Rashmi Paruti (RP)	RP
BAI405A	Discrete Mathematics (DMS)	Ms. Moumita Chatterjee(MC)	MC
BDSL456B	Mongo DB(MDB)	Ms.Priyanka (PR)	RP
BBOK407	Biology For Engineers (BFE)	Dr. N. Valarmathy (NV)	NV
BUHK408	Universal human values course (UHV)	Ms. Shwetha P R (SPR)	SPR
BNSK359	National Service Scheme (NSS)	Mr.Jaykuma	JK
BPEK359	Physical Education (PE)(Sports and Athletics)	Mr. Mahesh/ Mr.Dhanraj	MH/DR
BYOK359	YOGA	Mr.Abhilash	AL



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6<sup>th</sup> sem faculty names and subjects

<b>SUB CODE</b>	<b>SUBJECT</b>	<b>FACULTY</b>	<b>INITIAL</b>
21CS61	Software Engineering and Project Management (SEPM)	Dr. Bindhu Madhvi .P (BM)	BM
21AD62	Data Science and its Applications (DSA)	Ms. Rashmi Taruti (RT)	RT
21AI63	Machine Learning (ML)	Ms. Priyanka (PR)	PR
21AI641	Business Intelligence (BI)	Subharanjani T	ST
21EE652	Renewable Energy Resources (RER)	Ms. Shwetha P R (SPR)	SPR
21AIL66	Machine Learning Laboratory (ML LAB)	Ms. Priyanka (PR)	PR
21AIMP67	Mini Project (MP)	Dr. Bindhu Madhvi .P(BM)	BM
21INT68	Innovation/Entrepreneurship /Societal Internship	Dr. Bindhu Madhvi .P(BM)	BM
21NS83	National Service Scheme (NSS)	Mr.Jaykumar	JK
21PE83	Physical Education (PE)(Sports and Athletics)	Mr. Mahesh/ Mr.Dhanraj	MH/DR
21YO83	YOGA	Mr.Abhilash	AL





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**DEPARTMENT OF BIOTECHNOLOGY ENGINEERING**  
 ACADEMIC YEAR 2023-2024 (EVEN)

DAY/TIME	SEM	WEEK	ROOM NO	CLASS TEACHER	9:00-9:55	9:55-10:50	10:50 - 11:00		11:00- 11:55		11:55-12:50		12:50 -1:30		1:30-2:25		2:25-3:20		3:20-4:15		
							11:00	11:55	11:55-12:50	12:50 -1:30	1:30-2:25	2:25-3:20	3:20-4:15								
MONDAY	4	22/04/2024	707	Dr. Valarmathy K	MBGE (MN)	BPS(VM)	IT(AM)	BE(IN)	BS(LA)	UHV(SN)	NSS/SPOR TS										
	6	29/04/2024	705	Dr. Manjunath P	ST(JF)	CNR(SN)	BBE(MN)	BPCA(VM)	ETL-B1(TA);BPCAL-B2(VM)												
TUESDAY	8	12/2/2024	707	Dr. Annulya G	PP-2	PP-2	PP-2	PP-2	MBGE (MN)	MBGEL-B1(MN);ITL-B2(AM)											
	6	29/04/2024	705	Dr. Manjunath P	BBE(MN)	ST(JF)	CNR(SN)	ET(TA)	ETL-B1(TA);BPCAL-B2(VM)												
WEDNESDAY	4	22/04/2024	707	Dr. Valarmathy K	MBGE (MN)	BS(LA)	BPS(VM)	BE(IN)	MBGEL-B2(MN);ITL-B1(AM)												
	6	29/04/2024	705	Dr. Manjunath P	BPCA(VM)	ET(TA)	ST(JF)	BBE(MN)	-----MINI PROJECT-----												
THURSDAY	8	12/2/2024	707	Dr. Annulya G	PP-2	PP-2	PP-2	PP-2	PP-2	PP-2	PP-2										
	4	22/04/2024	707	Dr. Valarmathy K	IT(AM)	BPS(VM)	MBGE (MN)	BE(IN)	CLUB ACTIVITY	LIBRARY											
FRIDAY	6	29/04/2024	705	Dr. Manjunath P	CNR(SN)	ET(TA)	ST(JF)	BPCA(VM)	CLUB ACTIVITY	MENTORING											
	8	12/2/2024	707	Dr. Annulya G	PP-2	PP-2	PP-2	PP-2	TECHNICAL SEMINAR												
SATURDAY	6	29/04/2024	705	Dr. Manjunath P	ET(TA)	CNR(SN)	IT(AM)	BE(IN)	BSL(VL)	MENTORING											
	8	12/2/2024	707	Dr. Annulya G	RAB(TRA)	IBT(TA)	RAB(TRA)	IBT(TA)	MINI PROJECT	SPORTS											
Alternate Saturday weekday timetable																					

*Manjunath P*  
**HOD**

*U. J. J. J.*  
**DEAN ACADEMICS**

*[Signature]*  
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**DEPARTMENT OF BIOTECHNOLOGY ENGINEERING**  
 (Approved by AICTE, New Delhi, Bangalore-560 075)

ACADEMIC YEAR 2023-2024 (ODD)

DAY/TIME	SEM	WEEK	ROOM NO	CLASS TEACHER	9:00-9:55	9:55-10:50	10:50-11:00	11:00-11:55	11:55-12:50	12:50-1:30	1:30-2:25	2:25-3:20	3:20-4:15
MONDAY	3	15/11/2023	707	Dr. Valarmathy K	MB(TA)	UO(IN)		BC(RA)	CBG(SK)		MBL-B1(TA)/CLUB ACTIVITY-B2		
	5	25/11/2023	705	Dr. Salma Kausar	SBA(RA)	GP(SK)		BBE(VM)	IT(AM)		ETL-B1(TA);BPCAL-B2(VM)		
TUESDAY	7	11/09/2023	707	Dr. Amulya G	PEP(VM)	BBI(AM)		BPE(IN)	EE(TA)		BPEL-B1(VM)		
	3	15/11/2023	707	Dr. Valarmathy K	CBG(SK)	PP(NI)		BC(RA)	MB(TA)		MBL-B2(TA)/CLUB ACTIVITY-B1		
WEDNESDAY	5	25/11/2023	705	Dr. Salma Kausar	BBE(VM)	IT(AM)		GP(SK)	ES(IN)		SBA(RA)   RM(AM)   LIBRARY		
	7	11/09/2023	707	Dr. Amulya G	CPB(RA)	PEP(VM)		EE(TA)	BBI(AM)		BPEL-B2		
THURSDAY	3	15/11/2023	707	Dr. Valarmathy K	BC(RA)	PP(NI)		UO(IN)	CBG(SK)		UOL-B1(IN)/BCL-B2(RA)		
	5	25/11/2023	705	Dr. Salma Kausar	RM(AM)	GP(SK)		IT(AM)	BBE(VM)		-----MINI PROJECT-----		
FRIDAY	7	11/09/2023	707	Dr. Amulya G	BPE(IN)	EE(TA)		PEP(VM)	CPB(RA)		PP-1   PP-1   PP-1		
	3	15/11/2023	707	Dr. Valarmathy K	BBI(AM)	EP(VM)		MB(TA)	CPB(RA)		UOL-B2(IN)/BCL-B1(RA)		
SATURDAY	5	25/11/2023	705	Dr. Salma Kausar	SBA(RA)	GML(SK)		BBE(VM)	RM(AM)		CLUB ACTIVITY		
	7	11/09/2023	707	Dr. Amulya G	EE(TA)	BBI(AM)		CPB(RA)	BPE(IN)		PP-1		

Alternate Saturday weekday timetable

**HOD**

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**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF CIVIL ENGINEERING**  
 Academic Year 2023-2024 (Even Sem)

Sl. no	Days	SEME S TER	WEF	ROOMNO	CLASS TEACHER	9.00 to9.55	9.55 to 10.50		11.00 to 11.55	11.55 to 12.50		1.30 to 2.25	2.25 to 3.20	3.20 to 4.15
1	MON	4th	22/04/24	N208	Nayana B S &Gayathri R	CTP(PN)	TE(KSK)	S H O R T	FM(HN)	BE(TA)	L U N C H	UHV(HN)	M E N	PE(MK)
		6th	29/4/24	N209	Harshitha N &Kavya S K	DSS(NBS)	CME(PN)		RER(DV)	DSS(NBS)		ABM(KSK)	CT LAB(HN)	CT LAB(HN)
		8th	12/2/24	N206	Prakash N	PROJECTWORK			PROJECT WORK			PROJECT WORK		
2	TUE	4th	22/04/24	N208	Nayana B S &Gayathri R	BE(TA)	AOS (NBS)	B R E A K	CTP(PN)	TE(KSK)	B R E A K	CTP(PN))	FM LAB(HN)	
		6th	29/4/24	N209	Harshitha N&Kavya S K	CAD LAB(GR)	CAD LAB(GR)		CAD LAB(GR)	RER(DV)		ABM (KSK)	CLUB ACTIVITY	CLUB ACTIVITY
		8th	12/2/24	N206	Prakash N	PROJECTWORK			PROJECT WORK			PROJECT WORK		
3	WED	4th	22/04/24	N208	Nayana B S &Gayathri R	AOS (NBS)	FM(HN)	B R E A K	TE (KSK)	BE(TA)	B R E A K	AOS(NBS)	CLUB ACTIVITY	CLUB ACTIVITY
		6th	29/4/24	N209	Harshitha N&Kavya S K	ABM(KSK)	CME(PN)		RER(DV)	CT(HN)		CAD LAB(GR)		
		8th	12/2/24	N206	Prakash N	PROJECTWORK			PROJECT WORK			PROJECT WORK		





**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF CIVIL ENGINEERING**  
 Academic Year 2023-2024 (Even Sem)

4	THU	4th	22/04/24	N208	Nayana B S & Gayathri R	TE(KSK)	CTP(PN)	FM(HN)	BE(TA)	BMT LAB(KSK)		
		6th	29/4/24	N209	Harshitha N & Kavya S K	DSS(NBS)	ABM(KSK)	CME(PN)	RER(DV)	CT(HN)	MINI PROJECT	MINI PROJECT
		8th	12/2/24	N206	Prakash N	PROJECT WORK	PROJECT WORK	PROJECT WORK	PROJECT WORK	SEMINAR		
5	FRI	4th	22/04/24	N208	Nayana B S & Gayathri R	FM(HN)	AS (NBS)	TE LAB(KSK)		BIM LAB(PTS)		
		6th	29/4/24	N209	Harshitha N & Kavya S K	CME(PN)	CT(HN)	DSS(NBS)	CT(HN)	MENTORING	INTERNSHIP	PE
		8th	12/2/24	N206	Prakash N	RR(PN)	RR(PN)	PSC(GR)	PSC(GR)	INTERNSHIP		
6	SAT					PSC(GR)	PSC(GR)	RR(PN)	RR(PN)			

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THE OXFORD COLLEGE OF ENGINEERING  
DEPARTMENT OF CIVIL ENGINEERING  
Academic Year 2023-2024 (Even Sem)

4<sup>th</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY
BCV401	ANALYSIS OF STRUCTURES (AS)	MRS. NAYANA B S (NBS)
BCV402	FLUID MECHANICS AND HYDRAULICS (FM)	MRS. HARSHITHA N (NH)
BCV403	TRANSPORTATION ENGINEERING (PHE)	MS. KAVYA S K (KSK)
BCVL404	BUILDING MATERIAL TESTING LAB	MS. KAVYA S K (KSK)
BBOK407	BIOLOGY FOR ENGINEERS (BE)	NEW FACULTY (NF)
BCVL456A	BI M LAB	MR.PRASHANTH (PTS)
BGV405C	CONCRETE TECHNIQUES AND PRACTICES	MR.PRAKASH N (NP)
BPEK459	PHYYSICAL EDUCATION (GB)	MR. MAHESH KUMAR(MK)

6<sup>th</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY
21CV61	CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP	PRAKASH N(NP)
21CV62	CONCRETE TECHNOLOGY	HARSHITHA N
21CV63	SOLID WASTE MANAGEMENT	NAYANA (NBS)
21CV642	RENEWABLE ENERGY SOURCES	KAVYA SK (KSK)
21CV646	ALTERNATE BUILDING MATERIAL	KAVYA SK (KSK)
21CVL66	SOFTWARE APP LAB	GAYATHRI (GR)
21EE652	RENEWABLE ENERGY RESOURCES	DEVI VIGNESHWARI
21CVMP67	Mini Project	KAVYA SK (KSK) and HARSHITHA (HN)

8<sup>th</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY
18CV81	PRESTRESSED CONCRETE STRUCTURE	GAYATHRI (GR)
18CV82	RETROFITTING AND REHABILITATION	PRAKASH N(NP)
18CVI85	INTERNSHIP	DR T S MALLESHIAH(TSM)
18CVP83	PROJECT	PRAKASH N(NP)
18CVS84	SEMINAR	DR T S MALLESHIAH(TSM)



**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF CIVIL ENGINEERING**  
 Academic Year 2023-2024

Sl.no	Days	SEMESTER	WEF	ROOM NO	CLASS TEACHER	9.00 to 9.55	9.55 to 10.50	11.00 to 11.55	11.55 to 12.50	1.30 to 2.25	2.25 to 3.20	3.20 to 4.15
1	MON	3rd	15/11/23	N208	Nayana B S & Gayathri R	EG(GR))	ES(PN)	SUI(PT S)	MENTORING	ES(PN)		
		5th	25/11/23	N209	Harshitha N & Kavya S K	TE(NH)	GE (PTS)	DRCC(GR)	EG(GR))	OSS(PTS)	MENTORING (NH/KSK)	LIB
		7th	11/09/23	N206	Prakash N	DM(VKR)	DRCC (NBS)	DRCC (NBS)	GW H(NP)	CAD LAB(GR)		
2	TUE	3rd	31/10/23	N208	Nayana B S & Gayathri R	ES(PN)	FSB(PTS)	WE(KS K)	EG(GR)	CAD LAB(NBS)		
		5th	10/10/23	N209	Harshitha N & Kavya S K	DRCC(GR)	DRCC(GR)	TE(NH)	GE (PTS)	HWRE(KSK)	CLUB ACTIVITY	CLUB ACTIVITY
		7th	12/9/22	N206	Prakash N	UTP (KK)	QSM(TSM)	QSM(TSM)	MEN TORING	INTERNSHIP		
3	WED	3rd	31/10/23	N208	Nayana B S & Gayathri R	WE(KSK)	EG(GR)	SOM(NH)		CAD LAB(NBS)		
		5th	10/10/23	N209	Harshitha N & Kavya S K	GE (PTS)	TE(NH)	DRCC(GR)	HWRE(KSK)	TE(NH)		
		7th	12/9/22	N206	Prakash N	DRCC (NBS)	GW H (NP)	UTP(KK)	DM(VKR)	GT LAB(NP)		
4	THU	3rd	31/10/23	N208	Nayana B S & Gayathri R	SOM(NH)	EG(GR)	FSB(PT S)	ES(PN)	WE(KSK)	PE (MH)	YOGA (MH)
		5th	10/10/23	N209	Harshitha N & Kavya S	HWRE(KSK)	GE (PTS)	RMI(SCG)	RMI(SCG)	GEL(PN)		





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DEPARTMENT OF CIVIL ENGINEERING

Academic Year 2023-2024

		7th	12/9/22	N206	Prakash N	GWH (NP)	DM(VKR)	UTP (KK)	DRC C (NBS)	PROJECT WORK PHASE - 1		
5	FRI	3rd	31/10/23	N208	Nayana B S & Gayathri R	FSB(PTS)	ES(PN)	WE(KS K)	SOM(N H)	FSB(PTS)	EG(GR)	EG(GR)
		5th	10/10/23	N209	Harshitha N & Kavya S K	RMI(SCG)	TE(NH)	DRCC(GR )	OSS(PT S)	RMI(SCG)	ES(NH)	LIB/WCRS/P HY/ADC
		7th	12/9/22	N206	Prakash N	UTP (KK)	DM(VKR)	QSM(TS M)	QSM(TS M)	PROJECT WORK PHASE - 1		
6	SAT	Alternate Saturday weekday timetable										

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THE OXFORD COLLEGE OF ENGINEERING  
DEPARTMENT OF CIVIL ENGINEERING  
Academic Year 2023-2024

3<sup>rd</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY
BCV301	Strength of Materials	Ms. Harshitha N
BCV302	Engineering survey	Mr.Prakash N
BCV303	Engineering geology	Gayathri R
BCV304	Pubic heath	Kavya sk
BCV305	Computer Aided Building Planning and Drawing	Nayana B S
BCV306D	Social Connect and Responsibility	Ms. Harshitha N
BSCK307	Constitution of India and Professional Ethics	Dr.T.S.Malleshaiah
BCV358B	Fire Safety in Buildings	MR.PRASHANTH TS

5<sup>th</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY
21CV51	Hydrology and Water Resources	Kavya S K
21CV52	Transportaion Engineering	Harshitha (NH)
21CV53	Design of RC Structural Elements	Gayathri R(GR)
21CV54	Geotechnical Engg	MR.PRASHANTH TS
21CVL55	Geotechnical Engg Lab	Prakash N
21CV56	Research Methodology	Shivanand C G
21CIV57	Environmental Studies	Kavya SK(KSK)
21CV585	Concrete and Highway lab	HARSHITHAN

7<sup>th</sup> faculty names and subjects

SUB CODE	SUBJECT	FACULTY
18CV71	Quality Surveying and Contract Management	Dr. Malleshaiah T S (TSM)
18CV72	Design of RCC and Steel Structures	Mrs Nayana B S (NBS)
18CV734	Ground Water Hydraulics	Mr. Prakash N (PN)
18CV745	Urban Transport Planning	Ms. Kavyashree K (KK)



THE OXFORD COLLEGE OF ENGINEERING  
DEPARTMENT OF CIVIL ENGINEERING  
Academic Year 2023-2024

18EE753	Disaster Management	Mr. VARUN (VKR)
18CVL76	Computer Aided Detailing of Structures	Ms. Gayathri K (GK)
18CVL77	Geotechnical Engineering Laboratory	Mr. Prakash N (PN) / Mr. Prashanth Hathwar T S (PTS)
18CVP78	Project Work Phase - 1	Dr. Malleshaiah T S (TSM)
	Internship	Mr. Prakash N (PN)





**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF CIVIL ENGINEERING**  
Academic Year 2023-2024



**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
**MASTER TIME TABLE**  
**ACADEMIC YEAR 2023-24(ODD SEM)**

DAY / TIME	SEM	WEP	Room No.	Class Teacher	9:00-9:55	9:55-10:50	11:00-11:55	11:55-12:50	1:30-2:25	2:25-3:20	3:20-4:15
MON	1A	25.10.2023	406	Prof. RENYA BHARATHY	MEC(L)	NA(BS)	DSDV(PSSN)	S&I(F)	NA(BS)	EPC LAB	
	1B	25.10.2023	406A	Prof. TINA ELIZABETH THOMAS	EPC(TET)	DSDV(LT)	S&I(F)	NA(BS)	DSDV/ADSD LAB		
	5A	25.11.2023	404	Dr. SUCHANDANA MISHRA	DC(CR)	EMW(PS)	RMIPR(V)	COAM(SM)	STUDENT CLUB ACTIVITY MENTORING LIB		
	9H	25.11.2023	401	Prof. THIANKA SARANYA C.	EMW(NJ)	DC(CS)	CCN(CS)	ES(SB)	INTERNSHIP REVIEW	CLUB ACTIVITY	
TUE	7A,B	20.09.2023	403	Prof. JAYARAJ N. / Prof. HEFAT FATIMA	SAT COM(G)	EPC(RK)	CN LAB (A1) / VLST LAB (A2)	ES(SB)	CN (NJ)	SAT COM(G)	NI (PSSN)
	3A	25.10.2023	406A	Prof. TINA ELIZABETH THOMAS	MP(BS)	DSDV(LT)	S&I(F)	PENSS/YOGA	SCRIBS)	SCRIBS)	MENTOR MEET
	3B	25.10.2023	406A	Prof. TINA ELIZABETH THOMAS	COAM(SM)	DC(CR)	EPC(TE)	DSDV(LT)	MEC(M)	S&I(F)	CLUB ACTIVITY
	5A	25.11.2023	404	Dr. SUCHANDANA MISHRA	COAM(SM)	DC(CR)	CCN(CS)	EMW(PS)	COAM/COMMUNICATION LAB(A1/A2)	COAM/COMMUNICATION LAB(A1/A2)	
WED	7A,B	20.09.2023	403	Prof. JAYARAJ N. / Prof. HEFAT FATIMA	BMSIP(AK)	RMIPR(V)	DC(CS)	COAM(LT)	CCN(CS)	MENTOR MEET	LIB
	3A	25.10.2023	406	Prof. RENYA BHARATHY	MEC(L)	NA(BS)	CN LAB (A2) / VLST LAB (A1)	COAM(LT)	VLST(SK)	CN(NJ)	BMSIP(AK)
	3B	25.10.2023	406A	Prof. TINA ELIZABETH THOMAS	DSDV(LT)	NA(BS)	DSDV/ADSD LAB(A1/A2)	PE/SS/YOGA	EPC(TE)	S&I(F)	MENTOR
	5A	25.11.2023	404	Dr. SUCHANDANA MISHRA	ES(SB)	RMIPR(V)	COAM/COMMUNICATION LAB(A2/A1)	COAM(LT)	EMW(PS)	RMIPR(V)	DC(CR)
THU	7A,B	20.09.2023	403	Prof. JAYARAJ N. / Prof. HEFAT FATIMA	CN(NJ)	VLST(SK)	CCN(CS)	COAM(SM)	STUDENT CLUB ACTIVITY MENTORING LIB		
	3A	25.10.2023	406A	Dr. SUCHANDANA MISHRA	CCN(CS)	COAM(SM)	CCN(CS)	COAM(SM)	PROJECT CLUB ACTIVITY MENTORING LIB		
	3B	25.10.2023	406A	Prof. TINA ELIZABETH THOMAS	EPC(RK)	DSDV(PSSN)	CST LAB (B1/B2)	ML(PSSN)	PROJECT WORK PHASE 1		
	5B	25.11.2023	401	Prof. THIANKA SARANYA C.	COAM(LT)	RMIPR(V)	ML(PSSN)	SAT COM(G)	DSCV/ADSD LAB(A2/A1)		
FRI	7A,B	20.09.2023	403	Prof. JAYARAJ N. / Prof. HEFAT FATIMA	CN(NJ)	VLST(SK)	EPC(RK)	S&I(F)	MEC(N)	SCR(S)	SCR(S)
	3A	25.10.2023	406	Prof. RENYA BHARATHY	EPC(RK)	DSDV(PSSN)	EPC(TE)	MP(BS)	ES(SB)	CST LAB(A1/A2)	
	3B	25.10.2023	406A	Prof. TINA ELIZABETH THOMAS	MEC(M)	NA(BS)	RMIPR(V)	DC(CR)	EMW(NJ)	DC(CS)	ES(SB)
	5A	25.11.2023	404	Dr. SUCHANDANA MISHRA	CCN(CS)	EMW(PS)	COAM/COMMUNICATION LAB(B1/B2)	SAT COM(G)	PROJECT WORK PHASE 1		
SAT	7A,B	20.09.2023	403	Prof. JAYARAJ N. / Prof. HEFAT FATIMA	ML(PSSN)	BMSIP(AK)	SAT COM(G)	VLST(SK)			

3rd sem faculty names and subjects

3A

SUB CODE	SUBJECT	FACULTY
BMATTC301	AV Mathematics-III for EC Engineering(MEC)	Prof Lavanya(L)
BEC302	Digital System Design using Verilog(DSDV)	Prof.Prajwalasimha S N(PSN)
BEC303	Electronic Principles and Circuits(EPC)	Prof. Remyabharathy K(RK)
BEC304	Network Analysis(NA)	Dr B Srihatha(BS)
BECT305	Analog and Digital Systems Design Lab (ADSD LAB)	Prof Remyabharathy K(RK)
BEC306B	Sensors and Instrumentation(S&I)	Prof Ifrat Fatima(FF)
BSCK307	Social Connect and Responsibility(SCR)	Dr B Srihatha(BS)
BEC355B	MATLAB Programming(MP)	Prof.Prajwalasimha S N(PSN)
BPEK359	Physical Education (PE) /National Service	Mr.Mahesh(MH)
BNSK359	Scheme(NSS) YOGA	
BYOK359		

3B

SUB CODE	SUBJECT	FACULTY
BMATTC301	AV Mathematics-III for EC Engineering(MEC)	Prof .Mounita(M)
BEC302	Digital System Design using Verilog(DSDV)	Prof.Prajwalasimha S N(PSN)/Dr Laya Tojo(LT)
BEC303	Electronic Principles and Circuits(EPC)	Prof. Tina Elizabeth Thomas(TE)
BEC304	Network Analysis(NA)	Dr B Srihatha(BS)
BECT305	Analog and Digital Systems Design Lab (ADSD LAB)	Prof Ifrat Fatima(FF)
BEC306B	Sensors and Instrumentation(S&I)	Prof Ifrat Fatima(FF)
BSCK307	Social Connect and Responsibility(SCR)	Prof. Sheebakumar C(SC)
BEC358B	MATLAB Programming(MP)	Dr B Srihatha(BS)
BPEK359	Physical Education (PE) /National Service	Mr.Mahesh(MH)
BNSK359	Scheme(NSS) YOGA	
BYOK359		



5th sem faculty names and subjects

5A

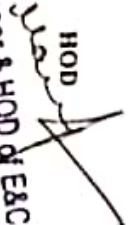
SUB CODE	SUBJECT	FACULTY
21EC51	DIGITAL COMMUNICATION(DC)	Dr. Chelana Reddy (CR)
21EC52	COMPUTER ORGANISATION & ARM MICROCONTROLLER(COAM)	Dr. Suchandana Mishra(SM)
21EC53	COMPUTER COMMUNICATION NETWORK(CCN)	Prof. Thanka Saranya C. (CS)
21EC54	ELECTRO MAGNETIC WAVES(EMW)	Dr. Preeta Sharan(PS)
21ECL55	COMMUNICATION LAB-II(COM LAB-II)	Dr. Chelana Reddy (CR)
21EC56	RESEARCH METHODOLOGY & INTELLECTUAL PROPERTY RIGHTS(RMIPR)	Dr. Vijaya Kumari(VJ)
21CIV57	ENVIRONMENTAL STUDIES(ES)	Dr. Shripabhat (SB)
21EC582	COMMUNICATION SIMULINK TOOL BOX(CST LAB)	Dr. Suchandana Mishra (SM) / Prof. Tina Elizabeth Thomas (TE)

5B


SUB CODE	SUBJECT	FACULTY
21EC51	DIGITAL COMMUNICATION(DC)	Prof. Thanka Saranya C. (CS)
21EC52	COMPUTER ORGANISATION & ARM MICROCONTROLLER(COAM)	Dr. Laya Tojof(LT)
21EC53	COMPUTER COMMUNICATION NETWORK(CCN)	Prof. Thanka Saranya C. (CS)
21EC54	ELECTRO MAGNETIC WAVES(EMW)	Prof. Jayaraj N
21ECL55	COMMUNICATION LAB-II(COM LAB-II)	Prof. Thanka Saranya C. (CS)
21EC56	RESEARCH METHODOLOGY & INTELLECTUAL PROPERTY RIGHTS(RMIPR)	Dr. Vijaya Kumari(VJ)
21CIV57	ENVIRONMENTAL STUDIES(ES)	Dr. Shripabhat (SB)
21EC582	COMMUNICATION SIMULINK TOOL BOX(CST LAB)	Prof. Tina Elizabeth Thomas/Prof. Jayaraj N

7th sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY
18EC71	COMPUTER NETWORKS (CN)	Prof. JAYARAJ N. (NJ)
18EC72	VLSI DESIGN (VLSID)	Prof. SHEERA KUAMRI (SK)
18EC73	SATELLITE COMMUNICATION (SAT COM)	Dr. CHRISPIN JIJU (CJ)
18EC74	MACHINE LEARNING USING PYTHON (MLP)	Prof. PRAJWALSINHIA (PSN)
18MT51	BIO MEDICAL SIGNAL PROCESSING (BSP)	Prof. ANUKUMARI (AK)
18ECL76	COMPUTER NETWORKS LAB (CN LAB)	Prof. JAYARAJ N. (NJ)
18ECL77	VLSI LABORATORY (VLSI LAB)	Prof. SHEERA KUAMRI (SK)
18ECL78	PROJECT WORK PHASE -1	Dr. CHRISPIN JIJU (CJ) / Prof. JAYARAJ N. (NJ)
18ECL79	INTERNSHIP	Prof. JAYARAJ N. (NJ) / Prof. IFFAT FATIMA (IF)

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**Professor & HOD of E&C Engineering**  
**The Oxford College of Engineering**  
**Bommanahalli, Bangalore-560 068**

  
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**Bommanahalli, Hosur Road**  
**Bengaluru-560 068**



**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
**MASTER TIME TABLE**  
**ACADEMIC YEAR 2023-24(EVEN SEM)**

DAY / TIME	SEM	WEEK	Room No.	Class Teacher	9:00-9:55		9:55-10:50		11:00-11:55		11:55-12:50		1:30-2:25			2:25-3:20			3:20-4:15		
					POCS (BK)	MC (LT)	POCS (CS)	ET (NI)	POCS (LAB) (BK) / MC LAB (A2) (LT)	CS (IF)	POCS (LAB) (B2) (CS) / MC LAB (B2) (SM)	ET (NI)	CS (LAB) (A1) (HS) / CT LAB (A2) (NI)	MC (IF)	CS (LAB) (B1) (IF) / CT LAB (B2) (S)	UHV (NI)	STUDENT CLUB ACTIVITY	MC (SM)	BFE (RA)	MC (IF)	STUDENT CLUB ACTIVITY
MON	4A	22.04.2024	406	Prof. RENYA BHARATHY																	
	4B	22.04.2024	406A	Prof. TINA ELIZABETH THOMAS	ET (NI)	MC (SM)															
	6A	29.04.2024	404	Dr. SUECHANDANA MISHRA	TIME (IF)	PJ/CS (BS/KR)															
	6B	29.04.2024	403A	Prof. THANUKA SARANYA C.	PP (BS)	PJ/CS (BS/KR)															
	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	PROJECT WORK																
	4A	22.04.2024	406	Prof. RENYA BHARATHY	MC (LT)	CS (BS)															
	4B	22.04.2024	406A	Prof. TINA ELIZABETH THOMAS	BFE (RA)	POCS (CS)															
	6A	29.04.2024	404	Dr. SUECHANDANA MISHRA	MTA (SM)	PP (NF)															
TUE	6B	29.04.2024	403A	Prof. THANUKA SARANYA C.	TIME (NF)	MTA (TET)															
	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	PROJECT WORK																
	4A	22.04.2024	406	Prof. RENYA BHARATHY	CS (BS)	BFE (RA)															
	4B	22.04.2024	406A	Prof. TINA ELIZABETH THOMAS	POCS (CS)	ET (NI)															
	6A	29.04.2024	404	Dr. SUECHANDANA MISHRA	TIME (IF)	VDT (CR)															
	6B	29.04.2024	403A	Prof. THANUKA SARANYA C.	TIME (NF)	VDT (SK)															
	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	PROJECT WORK																
	4A	22.04.2024	406	Prof. RENYA BHARATHY	ET (PS)	BFE (RA)															
WED	4B	22.04.2024	406A	Prof. TINA ELIZABETH THOMAS	CS (IF)	ET (NI)															
	6A	29.04.2024	404	Dr. SUECHANDANA MISHRA	PJ/CS (BS/KR)	MTA (SM)															
	6B	29.04.2024	403A	Prof. THANUKA SARANYA C.	PJ/CS (BS/KR)	VDT (SK)															
	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	PROJECT WORK																
	4A	22.04.2024	406	Prof. RENYA BHARATHY	ET (PS)	BFE (RA)															
	4B	22.04.2024	406A	Prof. TINA ELIZABETH THOMAS	CS (IF)	ET (NI)															
	6A	29.04.2024	404	Dr. SUECHANDANA MISHRA	PJ/CS (BS/KR)	MTA (SM)															
	6B	29.04.2024	403A	Prof. THANUKA SARANYA C.	PJ/CS (BS/KR)	VDT (SK)															
THU	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	PROJECT WORK																
	4A	22.04.2024	406	Prof. RENYA BHARATHY	POCS (BK)	MC (LT)															
	4B	22.04.2024	406A	Prof. TINA ELIZABETH THOMAS	POCS (CS)	CS (IF)															
	6A	29.04.2024	404	Dr. SUECHANDANA MISHRA	PJ/CS (BS/KR)	MTA (SM)															
	6B	29.04.2024	403A	Prof. THANUKA SARANYA C.	PJ/CS (BS/KR)	VDT (SK)															
	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	PROJECT WORK																
	4A	22.04.2024	406	Prof. RENYA BHARATHY	POCS (BK)	MC (LT)															
	4B	22.04.2024	406A	Prof. TINA ELIZABETH THOMAS	POCS (CS)	CS (IF)															
FRI	6A	29.04.2024	404	Dr. SUECHANDANA MISHRA	MTA (SM)	PP (NF)															
	6B	29.04.2024	403A	Prof. THANUKA SARANYA C.	MTA (TET)	PP (HS)															
	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	NS (NI)	NS (NI)															
	4A	22.04.2024	406	Prof. RENYA BHARATHY	POCS (BK)	MC (LT)															
	4B	22.04.2024	406A	Prof. TINA ELIZABETH THOMAS	POCS (CS)	CS (IF)															
	6A	29.04.2024	404	Dr. SUECHANDANA MISHRA	MTA (SM)	PP (NF)															
	6B	29.04.2024	403A	Prof. THANUKA SARANYA C.	MTA (TET)	PP (HS)															
	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	NS (NI)	NS (NI)															
SAT	8	12.02.2024	405	Prof. JAYARAJAN / Prof. BEFAT FATIMA	NS (NI)	NS (NI)															
					Alternate Saturday / Weekday Timetable																
					NS (NI)																
					NS (NI)																
					NS (NI)																
					NS (NI)																
					NS (NI)																
					NS (NI)																



4th sem faculty names and subjects

4A

SUB CODE	SUBJECT	FACULTY
BEC401	ELECTROMAGNETICS THEORY	Dr. PREETA SHARAN(PS)
BEC402	CONTROL SYSTEMS	Dr. B. SRILATHA(BS)
BEC403	PRINCIPLES OF COMMUNICATION SYSTEMS	Prof. REMYA BHARATHY K. (RK)
BEC405A	MICROCONTROLLERS	Dr. LAYA TOJO (LT)
BROK407	BIOLOGY FOR ENGINEERS	Prof. RANVY(A(RA)
BUIIK408	UNIVERSAL HUMAN VALUES COURSE	Prof. N. JAYARAJ (NJ)
BEC456A	MICROCONTROLLER LAB	Dr. LAYA TOJO (LT)
BECL404	COMMUNICATION LABORATORY	Prof. N. JAYARAJ (NJ) / Prof. REMYA BHARATHY
BNSK459 RPER459 BYOK459	NATIONAL SERVICE SCHEME (NSS) / PHYSICAL EDUCATION (PE) / YOGA	Prof. MAHESHI

4B

SUB CODE	SUBJECT	FACULTY
BEC401	ELECTROMAGNETICS THEORY	Prof. N. JAYARAJ (NJ)
BEC402	CONTROL SYSTEMS	Prof. IFEAT FATIMA(IF)
BEC403	PRINCIPLES OF COMMUNICATION SYSTEMS	Prof. THANKA SARANYA C. (CS)
BEC405A	MICROCONTROLLERS	Dr. SUCHANDANA MISHRA(SM)
BROK407	BIOLOGY FOR ENGINEERS	Prof. RANVY(A(RA)
BLIHK408	UNIVERSAL HUMAN VALUES COURSE	Dr. LAYA TOJO (LT)
BEC456A	MICROCONTROLLER LAB	Dr. SUCHANDANA MISHRA (SM) / Prof. TINA ELIZABETH THOMAS (TET)
BECL404	COMMUNICATION LABORATORY	Prof. THANKA SARANYA C. (CS) / Prof. MARY FRANCY JOSEPH
BNSK459/ BPER459/ BYOK459	NATIONAL SERVICE SCHEME (NSS) / PHYSICAL EDUCATION (PE) / YOGA	Prof. MAHESHI

6th sem faculty names and subjects

6A

SUB CODE	SUBJECT	FACULTY
21EC61	TECHNOLOGICAL INNOVATION MANAGEMENT AND ENTREPRENEURSHIP	Prof. JEFAT FATMAJIF
21EC62	MICROWAVE THEORY & ANTENNAS	Dr. SUCHANDANA MISHRA(SM)
21EC63	VLSI DESIGN & TESTING	Dr. CHITANA REDDY (CR)
21EC643	PYTHON PROGRAMMING	Prof. MARY FRANCY JOSEPH (MF)
21CS654 21CS653	PROGRAMMING IN JAVA / INTRODUCTION TO CYBERSECURITY	Prof. HINDYA SHREE (BS) / Prof. KAVYA K R (KR)
21ECL66	VLSI LABORATORY	Dr. CHITANA REDDY (CR)
21ECNP67	MINIPROJECT	Dr. SETHASOMYA SATHIRAJANPT. Dr. LATA TAVD
21INT68	INTERNSHIP	Dr. SUCHANDANA MISHRA(SM)

6B

SUB CODE	SUBJECT	FACULTY
21EC61	TECHNOLOGICAL INNOVATION MANAGEMENT AND ENTREPRENEURSHIP	Prof. MARY FRANCY JOSEPH (MF)
21EC62	MICROWAVE THEORY & ANTENNAS	Prof. TINA ELIZABETH THOMAS (TET)
21EC63	VLSI DESIGN & TESTING	Prof. SHEEBAKUMARI (SK)
21EC643	PYTHON PROGRAMMING	Dr. B. SRILATHA (BS)
21CS654 21CS653	PROGRAMMING IN JAVA / INTRODUCTION TO CYBERSECURITY	Prof. BINDYA SHREE (BS) / Prof. KAVYA K R (KR)
21ECL66	VLSI LABORATORY	Prof. SHEEBAKUMARI (SK)
21ECNP67	MINIPROJECT	Prof. TIANKA SARANYA C. (CS) / Prof. SHEEBAKUMARI (SK)
21INT68	INTERNSHIP	Prof. THANKA SARANYA C. (CS)

SR CODE	SUBJECT	FACULTY
1001 01	WORKSHOP AND CELLULAR CONSTRUCTION	DR. MANI DEVI AHS
1001 02	NETWORKS & THEORY	Prof. JAYARAJN AND
1001 03	PROJECT I WORK PHASE 1	DR. B. GEETHA SRI, Prof. JAYARAJN AND
1001 04	PROJECT I WORK PHASE 2	DR. JAYARAJN, T. Prof. SHEELAKI MARI (SC)
1001 05	PROJECT II WORK PHASE	Prof. JAYARAJN AND Prof. DEVIKALPANA (SC)

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING  
ACADEMIC YEAR 2023-2024 (EVEN)

Sl. No	Days	SEMESTER	WEF	ROOM NO	CLASS TEACHER	9.00 to 9.55	9.55 to 10.50	11.00 to 11.55	11.55 to 12.50	1.30 to 2.25	2.25 to 3.20	3.20 to 4.15	
1	MON	4th	05/06/24	N509	Mrs. Nisha C Rani & Mrs.M.Raichel Ruby	EM (RSR)	MC (NCR)	S H O R T  B R E A K	EPG (DV)	BE (MN)	EM lab - B1 (RSR)/ MC Lab - B2 (NCR) / AR Lab - B3 (DV)		
		6 <sup>th</sup>	20/03/24	N512	Mrs. Sumitha T L	M&E (NCR)	S&T (DV)		REP (NTV)	PSA (STL)	S&DSP (RR)	Mentoring	Library
		8th	12/02/24	N513	Mrs. Resna S R	Project Work			Project Work		Project Work		
2	TUE	4th	05/06/24	N509	Mrs. Nisha C Rani & Mrs.M.Raichel Ruby	MC (NCR)	EPG (DV)	S H O R T  B R E A K	EM (RSR)	T&D (STL)	EM lab - B2 (RSR)/ MC Lab - B3 (NCR) / AR Lab - B1 (DV)		
		6th	20/03/24	N512	Mrs. Sumitha T L	S&T (DV)	PSA (STL)		S&DSP (RR)	M&E (NCR)	PSA (STL)	Sports (MH)	Dept Activity
		8th	12/02/24	N513	Mrs. Resna S R	Project Work			Project Work		Project Work		
3	WED	4th	05/06/24	N509	Mrs. Nisha C Rani & Mrs.M.Raichel Ruby	T&D (STL)	EM lab - B3 (RSR)/ MC Lab - B1 (NCR) / AR Lab - B2 (DV)	S H O R T  B R E A K	EM lab - B3 (RSR)/ MC Lab - B1 (NCR) / AR Lab - B2 (DV)		MC (NCR)	Mentoring	Library
		6 <sup>th</sup>	20/03/24	N512	Mrs. Sumitha T L	REP (NTV)	S&DSP (RR)		PSA (STL)	S&DSP (RR)	DSP Lab - B1(RR) / PSA Lab - B2 (STL)		
		8th	12/02/24	N513	Mrs. Resna S R	Project Work			Project Work		Project Work		
4	THU	4th	05/06/24	N509	Mrs. Nisha C Rani & Mrs.M.Raichel Ruby	EPG (DV)	BE (MN)	S H O R T  B R E A K	EM (RSR)	T&D (STL)	BE (MN)	UHV (NJK)	Sports (MH)
		6 <sup>th</sup>	20/03/24	N512	Mrs. Sumitha T L	S&DSP (RR)	S&T (DV)		M&E (NCR)	REP (NTV)	DSP Lab - B2 (RR) / PSA Lab - B1 (STL)		
		8 <sup>th</sup>	12/02/24	N513	Mrs. Resna S R	Project Work			Project Work		Project Work		



5	FRI	4th	05/06/24	N509	Mrs. Nisha C Rani & Mrs.M.Raichel Ruby	BE (MN)	EM (RSR)	T&D (STL)	MC (NCR)	EPG (DV)	Dept Acti	
		6th	20/03/24	N512	Mrs. Sumitha T L	PSA (STL)	M&E (NCR)	S&T (DV)	REP (NTV)			Mini Project
		8th	12/02/24	N513	Mrs. Resna S R	HVDC (RR)	PSOC (NJK)	HVDC (RR)	PSOC (NJK)			Project/Internship/Technic Seminar Review
6	SAT	Alternate Saturday weekday timetable									Alternate Saturday weekd timetable	

#### 4th sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
BEE401	Electric Motors (EM)	Mrs.Resna S R	RSR
BEE402	Transmission and Distribution (T&D)	Mrs. Sumitha T L	STL
BEE403	Microcontroller(MC)	Mrs. Nisha C Rani	NCR
BEE405A	Electrical Power Generation and Economics (EPG)	Dr.Devi Vighneshwari	DV
BBOK407	Biology for Engineers(BE)	Dr.Manjunath	MN
BEEL456D	Aurdino & Rasberry PI Based Projects (ARLab)	Dr.Devi Vighneshwari	DV
BEEL404	Electric Motors lab (EM Lab)	Mrs.Resna S R	RSR
BUHK408	Universal Human Values(UHV)	Mr.N.JayaKumar.N	NJK
BPEK459	Physical Education (PE) (Sports and Athletics)	Mr. Mahesh	MH

#### 6th sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
21EE61	Management and Entrepreneurship(M&E)	Mrs. Nisha C Rani	NCR
21EE62	Power System Analysis-I (PSA-1)	Mrs. Sumitha T L	STL
21EE63	Signals and Digital Signal Processing (S&DSP)	Mrs.Raichel Ruby	RR
21EE641	Sensors and Transducers (S&T)	Dr.Devi Vighneshwari	DV
21ME652	Renewable Energy Power Plants (REP)	Dr. Nagaraj T V	NTV
21EEL66	Digital Signal Processing Laboratory(DSP LAB)	Mrs.Raichel Ruby	RR
21EEMP67	Mini Project (MP)	Concerned Guides	-
21EE61	Management and Entrepreneurship(M&E)	Mrs. Nisha C Rani	NCR

8th sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
18EE81	Power System Operation and Control (PSOC)	Mr.JayaKumar.N	NJK
18EE821	FACTS and HVDC Transmission (HVDC)	Dr.Devi Vigneshwari B & Mrs.Raichel ruby	DV&RR
18EES83	Project Phase - II	Mr.JayaKumar.N & Dr.Devi Vigneshwari B	DV & NJK
18EES84	Technical seminar	Mrs.Nisha C Rani & Mrs.Resna S R	NCR & RSR
18EEI85	Internship	Mrs.Resna S R & Mrs.Nisha C Rani	NCR & RSR

*Devi*

HOD

*P/C*  
Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bangalore-560 068

*U. Gal*  
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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
 ACADEMIC YEAR 2023-2024 (ODD)

Sl. No	Days	SEMESTER	WEEK	ROOM NO	CLASS TEACHER	9.00 to 9.55	9.55 to 10.50	S H O R T  B R E A K	11.00 to 11.55	11.55 to 12.50	L U N C H  B R E A K	1.30 to 2.25	2.25 to 3.20	3.20 to 4.15
									ECA (STL)	MAT (SM)		DLC (NCR)	ECA (STL)	Mentoring /Library
1	MON	3 <sup>rd</sup>	15 /11/23	N505	Dr.Devi Vigneshwari	T&G (RSR)	DLC (NCR)		ECA (STL)	MAT (SM)		EH Lab - NCR		
		5 <sup>th</sup>	25/11/23	N510	Mrs. Sumitha T L	PSA (DV)	T&D (STL)		PE (RR)	CS (RSR)		CS /PE Lab – RSR/RR		
		7 <sup>th</sup>	10/09/23	N512	Mrs. Resna S R	S&T (STL)	PSA-2(DV)		PSP (NJK)	IEV (RR)		Project Work		
2	TUE	3 <sup>rd</sup>	15 /11/23	N505	Dr.Devi Vigneshwari	AEC (NJK)	MAT (SM)		MAT (SM)	T&G (RSR)		DLC (NCR)	ECA (STL)	Mentoring /Library
		5 <sup>th</sup>	25/11/23	N510	Mrs. Sumitha T L	T&D (STL)	CS (RSR)		RM (BVS)	PSA (DV)		CS/PE Lab-JK/RR		
		7 <sup>th</sup>	10/09/23	N512	Mrs. Resna S R	UEP (NCR)	IEV (RR)		PSA-2 (DV)	PSA-2(DV)		PSS LAB(DV)		
3	WED	3 <sup>rd</sup>	15 /11/23	N505	Dr.Devi Vigneshwari	MAT (SM)	T&G (RSR)		AEC (NJK)	ECA (STL)		ECA Lab - MS		NSS/PE /YOGA (MH)
		5 <sup>th</sup>	25/11/23	N510	Mrs. Sumitha T L	CS (RSR)	PE (RR)		PSA (DV)	RM (BVS)		ES (PSG)	RM (BVS)	Mentoring
		7 <sup>th</sup>	10/09/23	N512	Mrs. Resna S R	PSP (NJK)	S&T (STL)		UEP (NCR)	IEV (RR)		Project Review		
4	THU	3 <sup>rd</sup>	15 /11/23	N505	Dr.Devi Vigneshwari	MAT (SM)	DLC (NCR)		T&G (RSR)	AEC (NJK)		T&G Lab(RSR)		
		5 <sup>th</sup>	25/11/23	N510	Mrs. Sumitha T L	PE (RR)	CS (RSR)		PSA (DV)	T&D (STL)		PE (RR)	T&D (STL)	Library
		7 <sup>th</sup>	10/09/23	N512	Mrs. Resna S R	PSA-2(DV)	IEV (RR)		S&T (STL)	UEP (NCR)		HV Lab – (NCR)		
5	FRI	3 <sup>rd</sup>	15 /11/23	N505	Dr.Devi Vigneshwari	DLC (NCR)	AEC (NJK)		ECA (STL)	SC&R (NCR)		AEC Lab(NJK)		
		5 <sup>th</sup>	25/11/23	N510	Mrs. Sumitha T L	PSA (DV)	T&D (STL)		PE (RR)	CS (RSR)		Renewable Energy Project (DV & STL)		
		7 <sup>th</sup>	10/09/23	N512	Mrs. Resna S R	PSP (NJK)	UEP (NCR)		PSA-2 (DV)	S&T (STL)		Project Work		
6	SAT	Alternate Saturday weekday timetable										Alternate Saturday weekday timetable		

### 3<sup>rd</sup> sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
BEE301	Engineering Mathematics for EEE(MAT)	Mrs Selestina Mary	SM
BEE302	Electrical Circuit Analysis(ECA)& ECA Lab	Mrs. Sumitha T L	STL
BEE303	Analog Electronic Circuits(AEC) & AEC Lab	Mr. N Jayakumar	NJK
BEE304	Transformers and Generators(T &G)	Mrs. Resna S R	RSR
BEE305	Transformers and Generators Lab(T&G Lab)	Mrs. Resna S R	RSR
BEE306A	Digital Logic Circuits(DLC)	Mrs. Nisha C Rani	NCR
BSCCK307	Social Connect and Responsibility(SC&R)	Mrs. Nisha C Rani	NCR
BEE358D	Electrical Hardware Lab(EH Lab)	Mrs. Nisha C Rani	NCR

### 5<sup>th</sup> sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
21EE51	Transmission and Distribution(T&D)	Mrs. Sumitha T L	STL
21EE52	Control Systems(CS) & CS Lab	Mrs. Resna S R & Mr. Jaya kumar .N	RSR & NJK
21EE53	Power System Analysis - 1(PSA)	Dr. Devi Vigneshwari B	DV
21EE54	Power Electronics(PE)	Mrs. Raichel Ruby	RR
21EEL55	Power Electronics Laboratory(PE Lab)	Mrs. Raichel Ruby	RR
21RMI56	Research Methodology & Intellectual Property Rights(RM)	Dr. Bharath V S	BVS
21CIV57	Environmental Studies(ES)	Dr. Pallavi S G	PSG
21EE581	Ability Enhancement Course-V Renewable Energy Project	Dr. Devi Vigneshwari B & Mrs. Sumitha T L	DV & STL
21EE51	Transmission and Distribution(T&D)	Mrs. Sumitha T L	STL

### 7<sup>th</sup> sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
18 EE71	Power System Analysis – 2	Dr. Devi Vighneshwari B	DV
18EE72	Power System Protection(PSP)	Mr. N. Jaya Kumar. N	NJK
18EE732	Micro- and Nano-scale Sensors and Transducers	Mrs. Sumitha T L	STL
18 EE742	Utilization of Electrical Power(UEP)	Mrs. Nisha C Rani	NCR
18AU754	Introduction to Electric Vehicles (IEV)	Mrs. Raichel Ruby	RR
18EEL76	Power System simulation Lab (PSS Lab)	Dr. Devi Vighneshwari B / Mrs. Sumitha T L	DV & STL
18EEL77	Relay and HV Lab (HV Lab)	Mrs. Nish C Rani	NCR
18EEP78	Project Review	Project respective Guides/ Dr. Devi Vighneshwari	DV

*Abhinav*  
 Prof. HOD, Head EEE  
 The Oxford College of Engg  
 Bommanahalli, Hosur Road  
 Bangalore-560 088

*V. Kal*  
 DEAN ACADEMICS

*Abhinav*  
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 Bommanahalli, Hosur Road  
 Bangalore-560 088





**Even Semester MBA Master timetable - Academic Year 2023-24**

DAYS	Sem/Sec	Room	Class Teacher	9.00AM - 10.00AM	10.00AM - 11.00AM	11.00AM- 11.10AM	11.10 AM - 12.10 PM	12.10 PM - 1.10 PM	1.10PM- 1.40PM	1.40PM - 2.40 PM	2.40 PM - 3.40 PM	3.40 PM - 4.15PM
MONDAY	2nd/A	N602	Dr. Tharakarami Reddy	OR (Dr.PKS)	FM (Dr.SS)	B R E A K	RM (Dr.MK)	OR (Dr.PKS)	L U N C H	ME (Mr SB)	Certification on Business Negotiation (Dr.HN)	
	2nd/B	N603	Dr. N Harish	FM (Dr.SS)	HRM (Dr.AR/Dr.AS)		SM (Dr.KTR)	ME (Mr.SB)		OR (Dr.PKS)	Certification on Business Negotiation (Dr.LS)	
	4th/BA & F	N601	Dr. V Lakshmi Suneetha	IM (Dr. AS)	HRA (Dr.MK)		HRA (Dr.MK)	IM (Dr. AS)		GFM (Dr.SS)	Advanced Excel Add-On Course	
	4th/BA & HR						CNM (Dr.PKS)					
	4th/M&F	N712	Dr. Sahana A	IDT (Dr.LS)	IMC (Dr.KTR)		IMC (Dr.KTR)	IDT (Dr.LS)		MACR (Dr. HN)	SPSS Add-on Course	
	4th/M & HR						CNM (Dr.PKS)					
TUESDAY	2nd/A	N602	Dr. Tharakarami Reddy	OR (Dr.PKS)	ME (Mr.SB)	B R E A K	SM (Mr.SB)	FM (Dr. SS)	L U N C H	HRM (Dr.AR/Dr.AS)	Certification on Futures & Options (Dr.PKS)	
	2nd/B	N603	Dr. N Harish	RM (Dr.HN)	OR (Dr.PKS)		HRM (Dr.AR/Dr.AS)	Societal Project		SM (Dr.KTR)	Certification on Futures & Options (Mr.SB)	
	4th/BA & F	N601	Dr. V Lakshmi Suneetha	ML (Dr.LS)	MACR (Dr. HN)		HRA (Dr.MK)	IM (Dr. AS)		GFM (Dr.SS)	Advanced Excel Add-On Course	
	4th/BA & HR						GHRM (Dr.MK)					
	4th/M&F	N712	Dr. Sahana A	SBM (Dr.KTR)	GFM (Dr.SS)		IMC (Dr.KTR)	IDT (Dr.LS)		MACR (Dr. HN)	SPSS Add-on Course	
	4th/M & HR						GHRM (Dr.MK)	CNM (Dr.PKS)				
WEDNESDAY	2nd/A	N602	Dr. Tharakarami Reddy	FM (Dr.SS)	Certification on EP/(Dr.AS)	B R E A K	SM (Mr.SB)	HRM (Dr.AR/Dr.AS)	L U N C H	OR (Dr.PKS)	Certification on Business Negotiation (Dr.HN)	
	2nd/B	N603	Dr. N Harish	OR (Dr.PKS)	ME (Mr.SB)		RM (Dr.HN)	OR (Dr.PKS)		FM (Dr.SS)	Certification on EP (Dr.AS)	
	4th/BA & F	N601	Dr. V Lakshmi Suneetha	IDT (Dr.LS)	GFM (Dr.SS)		Project work/ Mentoring	ML (Dr.LS)		HRA (Dr.MK)	Certification in Digital Marketing	
	4th/BA & HR						CNM (Dr.PKS)					
	4th/M&F	N712	Dr. Sahana A	IM (Dr. AS)	MACR (Dr. HN)		Project work/ Mentoring	SBM (Dr.KTR)		IMC (Dr.KTR)	Certification in Payroll Management	
	4th/M & HR						CNM (Dr.PKS)	Certification in Investment Management				
THURSDAY	2nd/A	N602	Dr. Tharakarami Reddy	RM (Dr.MK)	HRM (Dr.AR/Dr.AS)	B R E A K	ME (Mr.SB)	OR (Dr.PKS)	L U N C H	FM (Dr.SS)	Certification on Futures & Options (Dr.PKS)	
	2nd/B	N603	Dr. N Harish	FM (Dr.SS)	SM (Dr.KTR)		RM (Dr.HN)	ME (Mr.SB)		HRM (Dr.AR/Dr.AS)	Certification on Futures & Options (Mr.SB)	
	4th/BA & F	N601	Dr. V Lakshmi Suneetha	IM (Dr. AS)	GFM (Dr.SS)		IDT (Dr.LS)	MACR (Dr. HN)		ML (Dr.LS)	Advanced Excel Add-On Course	
	4th/BA & HR						CNM (Dr.PKS)	GHRM (Dr.MK)				
	4th/M&F	N712	Dr. Sahana A	IDT (Dr.LS)	MACR (Dr. HN)		IM (Dr. AS)	GFM (Dr.SS)		SBM (Dr.KTR)	SPSS Add-on Course	
	4th/M & HR						CNM (Dr.PKS)	GHRM (Dr.MK)				



FRIDAY	2nd/A	N602	Dr. Tharakarami Reddy	HRM (Dr.AR/Dr.AS)	SM (Mr.SB)	Certification on FP/ (Dr.AS)	RM (Dr.MK)	SM (Mr.SB)	RM (Dr.MK)	ME (Mr.SB)	
	2nd/B	N603	Dr. N Harish	RM (Dr.HN)	HRM (Dr.AR/Dr.AS)		FM (Dr.SS)	ME (Dr.SB)	SM (Dr.KTR)	Certification on Business Negotiation (Dr.LS)	
	4th/BA & F	N601	Dr. V Lakshmi Suneetha	ML (Dr.LS)	MACR (Dr. HN)		HIRA (Dr.MK)	IM (Dr. AS)	IDT (Dr.LS)	Project Review	
	4th/BA & HR				GHRM (Dr.MK)						
	4th/M&F	N712	Dr. Sahana A	SBM (Dr.KTR)	GFM (Dr.SS)		IMC (Dr.KTR)	IDT (Dr.LS)	IM (Dr. AS)	Project Review	
	4th/M & HR				GHRM (Dr.MK)						
SATURDAY	2nd/A	N602	Dr. Tharakarami Reddy	HRM (Dr.AR/Dr.AS)	FM (Dr.SS)	Societal Project	ME (Mr.SB)	Mentoring	OR (Dr.PKS)		
	2nd/B	N603	Dr. N Harish	OR (Dr.PKS)	ME (Mr.SB)		SM (Dr.KTR)	Mentoring	FM (Dr.SS)		
	4th/BA & F	N601	Dr. V Lakshmi Suneetha	HIRA (Dr.MK)	IM (Dr. AS)		MACR (Dr. HN)	ML (Dr.LS)	IDT (Dr.LS)	Library	
	4th/BA & HR						GHRM (Dr.MK)				
	4th/M&F	N712	Dr. Sahana A	IMC (Dr.KTR)	IDT (Dr.LS)		GFM (Dr.SS)	SBM (Dr.KTR)	IM (Dr. AS)	Library	
	4th/M & HR						GHRM (Dr.MK)				

2nd semester faculty names and subjects - w.e.f - 15.07.2024

CODE	SUBJECT NAME	FACULTY	Beyond Classroom Sessions	FACULTY
22MBA21	Human Resource Management (HRM)	Dr. Anitha Ramachander (Dr.AR) & Dr. Sahana A (Dr.AS)	Certification on Business Negotiation	Dr. Harish N (Dr.HN) & Dr. V Lakshmi Suneeth (Dr.LS)
22MBA22	Financial Management (FM)	Dr. Sreenivasulu Sunkara (Dr.SS)	Certification on Futures & Options	Dr. Praveen Kumar Sinha (Dr. PKS) & Mr.S Bharathidasan
22MBA23	Research Methodology and IPR (RM&IPR)	Dr. M Kathiravan (Dr.MK) & Dr. Harish N (Dr.HN)	Certification on Entrepreneurship Program	Dr. Sahana A (Dr.AS) & Dr. Sreenivasulu Sunkara (Dr.SS)
22MBA24	Operations Research (OR)	Dr. Praveen Kumar Sinha(Dr. PKS)		
22MBA25	Strategic Management (SM)	Dr.K.Tharakarami Reddy (Dr.KTR) & Mr.S Bharathidasan		
22MBA26	Managerial Economics (ME)	Mr.S Bharathidasan		

4th semester faculty names and subjects - w.e.f - 10.06.2024

CODE	SUBJECT NAME	FACULTY	Beyond Classroom Sessions	FACULTY
22MBA491	International Business (IB)	Dr. Sahana A ( Dr. AS)	Certification in Digital Marketing	Dr K.Tharakarami Reddy (Dr.KTR)
22MBA492	Innovative Design & Thinking (IDT)	Dr. V Lakshmi Suneetha (Dr.LS)	Certification in Payroll Management	Dr. Sahana A ( Dr. AS)

22MBAMM403	Strategic Brand Management (SBM)	Dr K Tharakarami Reddy (Dr.KTR)	Certification in Investment Management	Dr Harish N (Dr HN)
22MBAMM404	Integrated Marketing Communication (IMC)	Dr K.Tharakarami Reddy (Dr.KTR)	SPSS Add- On Course	Dr M Kathiravan (Dr MK)
22MBAFM403	Global Financial Management (GFM)	Dr. Srinivasulu. S (Dr SS)	Advanced Excel Add-on Course	Dr V Lakshmi Suneetha (Dr.LS)
22MBAFM404	Mergers, Acquisitions & Corporate Restructuring (MACR)	Dr. Harish N (Dr.HN)		
22MBAHR403	Conflict & Negotiation Management (CNM)	Dr. Praveen Kumar Sinha (Dr.PKS)		
22MBAHR404	Global HRM (GHRM)	Dr. M Kathiravan (Dr.MK)		
22MBABA403	Machine Learning (ML)	Dr. V Lakshmi Suneetha (Dr.LS)		
22MBABA404	HR Analytics (HRA)	Dr. M Kathiravan (Dr.MK)		

*A. Sakana*  
COORDINATOR/MBA

*MWT*  
HOD-MBA  
HOD Dept of Business Administration  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bangalore - 560068

*MWT*  
DIRECTOR - MBA & MCA  
DIRECTOR - MBA & MCA  
The Oxford College of Engineering  
Bommanahalli, Hosur Road,  
Bengaluru - 560068.





**Odd Semester MBA Master timetable - Academic Year 2023-24**

DAYS	Sem	Sec	Room	Class Teacher	9.00AM-9.55AM	9.55AM-10.50AM	10.50AM-11.00AM	11.00AM-11.55AM	11.55AM-12.50PM	12.50PM-1.30PM	1.30PM-2.25PM	2.25PM-3.20PM	3.20PM-4.15PM
MONDAY	3A	BA & F	601	Dr. V Lakshmi Suneetha	IPDCS (Dr.LS)	ITM (Dr. AS)	B R E A K	SAPM (Dr.HN)	LSCM (Dr.LS)	L U N C H	SCM (Dr.LS)	EDAB (Dr. MK)	Internship review
		BA & HR						IRL (Dr.MK)			R&S (Dr.KTR)		Library
	3B	M&F	712	Dr. Sahana A	S&RM (Dr.MK)	LSCM (Dr.KTR)		SAPM (Dr.HN)	ITM (Dr. AS)		SCM (Dr.LS)	CB (Dr.AS)	Library
		M & HR						IRL (Dr.MK)			R&S (Dr.KTR)		Library
1	A	602	Dr. M Kathiravan	MM (Dr.KTR)	BC (Dr.AS)	SFM (Dr.PG)	PMOB (Dr.MK)	ED (Dr.NH)	Proficiency in Computer Literacy (Lab)				
1	B	603	Dr. N Harish	AFM (Dr. VLS)	PMOB (Dr.MK)	ED (Dr.NH)	MM (Dr.KTR)	SFM (Dr.PG)	Employability Skills - Technical				
TUESDAY	3A	BA & F	601	Dr. V Lakshmi Suneetha	LSCM (Dr.LS)	SAPM (Dr.HN)	B R E A K	SCM (Dr.LS)	EDAB (Dr. MK)	L U N C H	ITM (Dr. AS)	IPDCS (Dr.LS)	Library
		BA & HR						IRL (Dr.MK)			R&S (Dr.KTR)		Library
	3B	M&F	712	Dr. Sahana A	ITM (Dr. AS)	SAPM (Dr.HN)		SCM (Dr.LS)	CB (Dr.AS)		LSCM (Dr.KTR)	S&RM (Dr.MK)	Mentoring
		M & HR						IRL (Dr.MK)			R&S (Dr.KTR)		Mentoring
1	A	602	Dr. M Kathiravan	SFM (Dr.PG)	BC (Dr.AS)	MM (Dr.KTR)	AFM (Dr. NH)	PMOB (Dr.MK)	Employability Skills - Personality Development				
1	B	603	Dr. N Harish	BC (Dr.AS)	ED (Dr.NH)	SFM (Dr.PG)	PMOB (Dr.MK)	ED (Dr.NH)	Proficiency in Computer Literacy (Lab)				
WEDNESDAY	3A	BA & F	601	Dr. V Lakshmi Suneetha	EDAB (Dr. MK)	SCM (Dr.LS)	B R E A K	LSCM (Dr.LS)	SAPM (Dr.HN)	L U N C H	ITM (Dr. AS)	IPDCS (Dr.LS)	Mentoring
		BA & HR						R&S (Dr.KTR)			IRL (Dr.MK)		Mentoring
	3B	M&F	712	Dr. Sahana A	CB (Dr.AS)	SCM (Dr.LS)		ITM (Dr. AS)	SAPM (Dr.HN)		LSCM (Dr.KTR)	S&RM (Dr.MK)	Internship review
		M & HR						R&S (Dr.KTR)			IRL (Dr.MK)		Internship review
1	A	602	Dr. M Kathiravan	BC (Dr.AS)	AFM (Dr. NH)	MM (Dr.KTR)	ED (Dr.NH)	SFM (Dr.PG)	Entrepreneurship Activities				
1	B	603	Dr. N Harish	PMOB (Dr.MK)	SFM (Dr.PG)	AFM (Dr. VLS)	Library /Mentoring	MM (Dr.KTR)	NewsPaper Analysis				
THURSDAY	3A	BA & F	601	Dr. V Lakshmi Suneetha	IPDCS (Dr.LS)	ITM (Dr. AS)	B R E A K	SAPM (Dr.HN)	LSCM (Dr.LS)	L U N C H	EDAB (Dr. MK)	SCM (Dr.LS)	Library
		BA & HR						IRL (Dr.MK)			R&S (Dr.KTR)		Library
	3B	M&F	712	Dr. Sahana A	S&RM (Dr.MK)	LSCM (Dr.KTR)		SAPM (Dr.HN)	ITM (Dr. AS)		CB (Dr.AS)	SCM (Dr.LS)	Internship review
		M & HR						IRL (Dr.MK)			R&S (Dr.KTR)		Internship review
1	A	602	Dr. M Kathiravan	BC (Dr.AS)	AFM (Dr. NH)	PMOB (Dr.MK)	ED (Dr.NH)	Library /Mentoring	NewsPaper Analysis				
1	B	603	Dr. N Harish	PMOB (Dr.MK)	BC (Dr.AS)	ED (Dr.NH)	MM (Dr.KTR)	BC (Dr.AS)	Entrepreneurship Activities				
FRIDAY	3A	BA & F	601	Dr. V Lakshmi Suneetha	LSCM (Dr.LS)	IPDCS (Dr.LS)	B R E A K	SAPM (Dr.HN)	SCM (Dr.LS)	L U N C H	EDAB (Dr. MK)	ITM (Dr. AS)	Internship review
		BA & HR						IRL (Dr.MK)			R&S (Dr.KTR)		Library
	3B	M&F	712	Dr. Sahana A	ITM (Dr. AS)	S&RM (Dr.MK)		SAPM (Dr.HN)	SCM (Dr.LS)		CB (Dr.AS)	LSCM (Dr.KTR)	Library
		M & HR						IRL (Dr.MK)			R&S (Dr.KTR)		Library
1	A	602	Dr. M Kathiravan	ED (Dr.NH)	SFM (Dr.PG)	MM (Dr.KTR)	PMOB (Dr.MK)	AFM (Dr. NH)	Employability Skills - Technical				
1	B	603	Dr. N Harish	AFM (Dr. VLS)	MM (Dr.KTR)	SFM (Dr.PG)	ED (Dr.NH)	BC (Dr.AS)	Employability Skills - Personality Development				
SATURDAY	Alternate Saturday full day - with daywise timetable												



3rd semester faculty names and subjects - w.e.f - 01.12.2023

CODE	SUBJECT NAME	FACULTY
22MBA301	Logistics & Supply Chain Management (LSCM)	Dr. V Lakshmi Suneetha (Dr.LS) Dr.K.Tharakarami Reddy (Dr.KTR)
22MBA302	IT for Managers (ITM)	Dr. Sahana A ( Dr. AS)
22MBAAM303	Consumer Behaviour (CB)	Dr. Sahana A ( Dr. AS)
22MBAAM304	Sales & Retail Management (S&RM)	Dr. M Kathiravan (Dr.MK)
22MBAFM303	Strategic Cost Management (SCM)	Dr. V Lakshmi Suneetha (Dr.LS)
22MBAFM304	Security Analysis & Portfolio Management (SAPM)	Dr. Harish N (Dr.HN)
22MBAHR303	Recruitment & Selection (R&S)	Dr.K.Tharakarami Reddy (Dr.KTR)
22MBAHR304	Industrial Relations & Legislations (IR&L)	Dr. M Kathiravan (Dr.MK)
22MBAIA303	Introduction to Python Data and Control systems (IPDCS)	Dr. V Lakshmi Suneetha (Dr.LS)
22MBAIA304	Exploratory Data Analysis for Business (EDAB)	Dr. M Kathiravan (Dr.MK)

1st semester faculty names with subjects w.e.f -1.4.2024

CODE	COURSE CODE	FACULTY	Beyond Classroom Sessions	FACULTY
22MBA11	Principles of Management & organisational	Dr. M Kathiravan (Dr.MK)	NewsPaper Analysis	Dr. V Lakshmi Suneetha (Dr. VLS)
22MBA12	Entrepreneurship Development (ED)	Dr. Harish N (Dr.HN)	Employability Skills - Technical	Dr. M Kathiravan (Dr.MK)
22MBA13	Accounting for Managers (AFM)	Dr. Harish N (Dr.HN) &	Employability Skills - Personality	Dr.K.Tharakarami Reddy (Dr.KTR)
22MBA14	Statistics for Managers (SFM)	Dr. Pallavi G (Dr. PG)	Profeciency in Computer Literacy (Lab)	Dr. Sahana A (Dr.AS)
22MBA15	Marketing Management (MM)	Dr.K.Tharakarami Reddy (Dr.KTR)	Entrepreneurship Activities	Dr. Harish N (Dr.HN)
22MBA16	Business Communication (BC)	Dr. Anitha Ramachander (Dr.AR) &		

*A. Sahana*  
COORDINATOR/MBA

*Mwb*  
HOD-MBA  
Dept. of Business Administration  
The Oxford College of Engineering  
Bommanahalli Hosur Road  
Bangalore-560068

*Mwb*  
DIRECTOR-MBA & MCA  
DIRECTOR - MBA & MCA  
The Oxford College of Engineering  
Bommanahalli, Hosur Road,  
Bengaluru - 560068.



THE OXFORD COLLEGE OF ENGINEERING  
DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS  
Academic Year 2023-2024

Sl.no	Days	SEMESTER	WEEK	ROOM NO	CLASS TEACHER	9.00to 9.55	9.55to 10.50		11.00to 11.55	11.55to 12.50		1.30to 2.25	2.25to 3.20	3.20to 4.15	
1	MON	1 <sup>st</sup> A	12/2/24	502	Mridula Shukla	DAA (JC A)	MFC A(V L)	<b>S H O R T B R E A K</b>	OS(A BP)	CN(MA)	<b>L U N C H B R E A K</b>	DS(S J)	CN(MA)	Aptitude Training(MA)	
		1 <sup>st</sup> B	12/2/24	503	Liya Naiju	MFCA(VL)	CN(MA)		DAA(JCA)	Aptitude Training(LN)		DS Lab (MS) CN Lab (ABP)	Aptitude Training(MA)		
		3 <sup>rd</sup> A	11/12/23	616	Ashok BP	DN/ST (MS/ABP)	DAP(LN)		CC/OOMD (DV/JCA)	IOT(PS)		DAP LAB(LN+ABP) IOT LAB(DV+JCA)			
		3 <sup>rd</sup> B	11/12/23	617	JC Achutha	DN/ST (MS/ABP)	IOT(MA)		CC/OOMD (DV/JCA)	DAP(LN)		Tutorial	Mentor	Library	
2	TUE	1 <sup>st</sup> A	12/2/24	502	Mridula Shukla	DAA (JC A)	OS(ABP)	<b>S H O R T B R E A K</b>	RMIPR(MS)	CN(MA)	<b>L U N C H B R E A K</b>	MFCA(VL)	22MCA12 IPCC Lab MS		
		1 <sup>st</sup> B	12/2/24	503	Liya Naiju	RMIPR(DV)	CN(MA)		DS(PM)	OS(ABP)		DS Lab (PM) CN Lab (ABP)			
		3 <sup>rd</sup> A	11/12/23	616	Ashok BP	DN/ST (MS/ABP)	IOT(PS)		CC/OOMD (DV/JCA)	DAP(LN)		DAP LAB(LN+MS) IOT LAB(MA+JCA)			
		3 <sup>rd</sup> B	11/12/23	617	JC Achutha	DN/ST (MS/ABP)	DAP(LN)		CC/OOMD (DV/JCA)	IOT(MA)		Societal Project DV			



**THE OXFORD COLLEGE OF ENGINEERING**  
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3	WED	1 <sup>st</sup> A	12/2/24	502	Mridula Shukla	OS(ABP)	DS(SJ)	DAA(JCA)	CN(MA)	MFCA(VL)	BP&CO(LN)	Preplacement Tech Trng(MS)
		1 <sup>st</sup> B	12/2/24	503	Liya Naiju	MFCA(VL)	RMIPR(DV)	DS(PM)	DAA(JCA)	OS(ABP)	BP&CO(LN)	Preplacement Tech Trng(MS)
		3 <sup>rd</sup> A	11/12/23	616	Ashok BP	CC/OO MD (DV/JCA)	DAP(LN)	DN/ST (MS/ABP)	IOT(PS)	Societal Project MS		
		3 <sup>rd</sup> B	11/12/23	617	JC Achutha	CC/OO MD (DV/JCA)	IOT(MA)	DN/ST (MS/ABP)	DAP(LN)	DAP LAB(LN+ABP) IOT LAB(MA+MS)		
4	THU	1 <sup>st</sup> A	12/2/24	502	Mridula Shukla	DS(SJ)	DS Lab (SJ)	CN Lab (MA)	Aptitude Training (MA)	OS(ABP)	MFCA(VL)	BP&CO(LN)
		1 <sup>st</sup> B	12/2/24	503	Liya Naiju	CN Lab (MA)	MFCA(VL)	OS(ABP)	DAA(JCA)	DS(PM)	RMIPR(DV)	BP&CO(LN)
		3 <sup>rd</sup> A	11/12/23	616	Ashok BP	CC/OO MD (DV/JCA)	Project Work Phase 1 ABP	Project Work Phase 1 ABP	IOT(PS)	Tutorial	Mentor	Library
		3 <sup>rd</sup> B	11/12/23	617	JC Achutha	CC/OO MD (DV/JCA)	Internship Seminar	Internship Seminar	DAP(LN)	DAP LAB(MS+DV) IOT LAB(MA+JCA)		
5	FRI	1 <sup>st</sup> A	12/2/24	502	Mridula Shukla	DAA(JCA)	CN(MA)	RMIPR(MS)	DS(SJ)	DS LAB(SJ) CN LAB(JCA)		
		1 <sup>st</sup> B	12/2/24	503	Liya Naiju	DS(PM)	22MCA12 LAB	IPCC Lab DV	DAA(JCA)	OS(ABP)	CN(MA)	MFCA(VL)
		3 <sup>rd</sup> A	11/12/23	616	Ashok BP	DN/ST (MS/ABP)	Internship Seminar	Internship Seminar	DAP(LN)	Tutorial	Mentor	Library





THE OXFORD COLLEGE OF ENGINEERING  
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		3 <sup>rd</sup> B	11/12/23	617	JC Achutha	DN/ST (MS/ ABP)	Project Work Phase 1 ABP	Project Work Phase 1 ABP	IOT(MA)	Tutorial	Mentor	Library	
6	SAT	Alternate Saturday weekday timetable								Alternate Saturday weekday timetable			

1<sup>st</sup> A sem faculty names and subjects

SUBCODE	SUBJECT	FACULTY	INITIAL
22MCA11	Mathematical Foundation for Computer Application(MFCA)	Ms.Varalakshmi L	VL
22MCA12	Operating System Concepts(OS)	Mr.Ashok BP	DV
22MCA13	Data Structures(DS)	Mrs.Sowmya Jayaraj	SJ
22MCA14	Computer Networks(CN)	Mrs. Mary Anitha T	MA
22MCA15	Design and Analysis of Algorithms (DAA)	Mr.JC Achutha	JCA
22RMI18	Research Methodology and IPR(RM & IPR)	Mridula Shukla	MS
22MCAL16	Data Structures with Algorithms Laboratory(DS LAB)	Mrs.Sowmya Jayaraj	SJ
22MCAL17	Computer Networks Laboratory(CN LAB)	Mrs. Mary Anitha T	MA



THE OXFORD COLLEGE OF ENGINEERING  
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Academic Year 2023-2024

1<sup>st</sup> B sem faculty names and subjects

SUBCODE	SUBJECT	FACULTY	INITIAL
22MCA11	Mathematical Foundation for Computer Application(MFCA)	Ms.Varalakshmi L	VL
22MCA12	Operating System Concepts(OS)	Mr.Ashok BP	DV
22MCA13	Data Structures(DS)	Mrs.S K Pankaja Menon	PM
22MCA14	Computer Networks(CN)	Mrs. Mary Anitha T	MA
22MCA15	Design and Analysis of Algorithms (DAA)	Mr.JC Achutha	JCA
22RMI18	Research Methodology and IPR(RM & IPR)	Mr. Dharamvir	DV
22MCAL16	Data Structures with Algorithms Laboratory(DS LAB)	Mrs.S K Pankaja Menon	PM
22MCAL17	Computer Networks Laboratory(CN LAB)	Mrs. Mary Anitha T	MA

3<sup>rd</sup> A sem faculty names and subjects

SUBCODE	SUBJECT	FACULTY	INITIAL
22MCA31	Data Analytics using Python(DAP)	Mrs. Liya Naiju	LN
22MCA32	IOT(IOT)	Dr. Puja Shashi	PS
22MCA332	Cloud Computing(CC)	Mr. Dharamvir	DV
22MCA334	Object Oriented Modeling and Design (OOMD)	Mr.JC Achutha	JCA
22MCA342	Introduction to Dot Net framework for application development(DN)	Mrs.Mridula Shukla	MS
22MCA344	Software Testing (ST)	Mr.Ashok BP	ABP
22MCAL35	Project Work Phase 1	Mr.Ashok BP	ABP
22MCAL36	Data Analytics using Lab with Mini Project	Mrs. Liya Naiju	LN
22MCAL37	IOT Lab with Mini Project	Mr.JC Achutha	JCA
22MCAL38	Societal Project	Mrs.Mridula Shukla	MS
22MCAL39	Internship(4 weeks in vacation of 2nd sem)	Internship Guides	



THE OXFORD COLLEGE OF ENGINEERING  
DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS  
Academic Year 2023-2024

3<sup>rd</sup> B sem faculty names and subjects

SUBCODE	SUBJECT	FACULTY	INITIAL
22MCA31	Data Analytics using Python(DAP)	Mrs. Liya Naiju	LN
22MCA32	IOT(IOT)	Mrs. Mary Anitha T	MA
22MCA332	Cloud Computing(CC)	Mr. Dharamvir	DV
22MCA334	Object Oriented Modeling and Design (OOMD)	Mr.JC Achutha	JCA
22MCA342	Introduction to Dot Net framework for application development(DN)	Mrs.Mridula Shukla	MS
22MCA344	Software Testing (ST)	Mr.Ashok BP	ABP
22MCAL35	Project Work Phase 1	Mr.Ashok BP	ABP
22MCAL36	Data Analytics using Lab with Mini Project	Mrs. Liya Naiju	LN
22MCAL37	IOT Lab with Mini Project	Mrs. Mary Anitha T	MA
22MCAL38	Societal Project	Mr. Dharamvir	DV
22MCAL39	Internship(4 weeks in vacation of 2nd sem)	Internship Guides	





THE OXFORD COLLEGE OF ENGINEERING  
**DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS**  
 Academic Year 2023-2024

Sl.no	Days	SEMESTER	WEF	ROOM NO	CLASS TEACHER	9.00to 9.55	9.55to 10.50	11.00to 11.55	11.55to 12.50	1.30to 2.25	2.25to3.20	3.20to 4.15
1	MON	4 <sup>th</sup> A	22/4/24	502	Ashok BP	PROJECTWORK		PROJECTWORK		PROJECTWORK		
		4 <sup>th</sup> B	22/4/24	503	JC Achutha	PROJECTWORK		PROJECTWORK		PROJECTWORK		
		2 <sup>nd</sup> A	15/7/24	617	Mary Anitha T	MA(DV)	WT(SJ)	UID(MA)	JAVA (MS)	Seminar		
		2 <sup>nd</sup> B	15/7/24	616	Sowmya Jayaraj	DBMS (ABP)	JAVA (MS)	DBMS Lab (B1+B2) (ABP+SJ+PM)		Seminar		
2	TUE	4 <sup>th</sup> A	22/4/24	502	Ashok BP	PROJECTWORK		PROJECTWORK		PROJECTWORK		
		4 <sup>th</sup> B	22/4/24	503	JC Achutha	PROJECTWORK		PROJECTWORK		PROJECTWORK		
		2 <sup>nd</sup> A	15/7/24	617	Mary Anitha T	MA(DV)	SE(PM)	DBMS Lab (A1+A2) (SJ+ABP+PM)		Seminar		
		2 <sup>nd</sup> B	15/7/24	616	Sowmya Jayaraj	DBMS (ABP)	WT(SJ)	MA(DV)	SE(PM)	Seminar		
3	WED	4 <sup>th</sup> A	22/4/24	502	Ashok BP	PROJECTWORK		PROJECTWORK		PROJECTWORK		
		4 <sup>th</sup> B	22/4/24	503	JC Achutha	PROJECTWORK		PROJECTWORK		PROJECTWORK		
		2 <sup>nd</sup> A	15/7/24	617	Mary Anitha T	MA(DV)	DBMS (ABP)	UID(MA)	JAVA (MS)	Seminar		
		2 <sup>nd</sup> B	15/7/24	616	Sowmya Jayaraj	DBMS (ABP)	MA(DV)	WT(SJ)	SE(PM)	Seminar		
4	THU	4 <sup>th</sup> A	22/4/24	502	Ashok BP	ITPM (DV)	BDA/SPM (MA/ABP)	ITPM (DV)	Technical Seminar (ABP)	PROJECTWORK PHASE 2 REVIEW (DV,JCA,MS,ABP,AM,SJ)	Aptitude Training(DV)	
		4 <sup>th</sup> B	22/4/24	503	JC Achutha	ITPM (JCA)	BDA/SPM (MA/ABP)	ITPM (JCA)	Technical Seminar (MS)	PROJECTWORK PHASE 2 REVIEW (DV,JCA,MS,ABP,AM,SJ)	Aptitude Training(DV)	
		2 <sup>nd</sup> A	15/7/24	617	Mary Anitha T	DBMS (ABP)	WT(SJ)	SE(PM)	UID(MA)	JAVA Lab (A1+A2) (MS+MA+PM)		
		2 <sup>nd</sup> B	15/7/24	616	Sowmya Jayaraj	MA(DV)	UID(MA)	WT(SJ)	JAVA (MS)	Seminar		
5	FRI	4 <sup>th</sup> A	22/4/24	502	Ashok BP	BDA/SPM (MA/ABP)	ITPM (DV)	BDA/SPM (MA/ABP)	Technical Seminar (ABP)	PROJECTWORK PHASE 2 REVIEW (DV,JCA,MS,ABP,AM,SJ)	Aptitude Training(JCA)	

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**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS**

Academic Year 2023-2024

		4 <sup>th</sup> B	22/4/24	503	JC Achutha	BDA/SP M (MA/AB P)	ITPM (JCA)		BDA/SPM (MA/ABP)	Technical Seminar (MS)	PROJECTWORK PHASE 2 REVIEW (DV,JCA,MS,ABP,AM,SJ)	Aptitude Training(J CA)	
		2 <sup>nd</sup> A	15/7/24	617	Mary Anitha T	DBMS (ABP)	JAVA (MS)		WT(SJ)	SE(PM)	Seminar		
		2 <sup>nd</sup> B	15/7/24	616	Sowmya Jayaraj	MA(DV)	SE(PM)		UID(MA)	JAVA (MS)	JAVA Lab (B1+B2) (MS+MA+PM)		
6	SAT	Alternate Saturday weekday timetable											Alternate Saturday weekday timetable



THE OXFORD COLLEGE OF ENGINEERING  
DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS  
Academic Year 2023-2024

4<sup>th</sup> A sem faculty names and subjects

SUBCODE	SUBJECT	FACULTY	INITIAL
22MCA412	Big Data Analytics(BDA)	Mrs. Mary Anitha T	MA
22MCA414	Software Project Management(SPM)	Mr. Ashok BP	ABP
22MCA421	IT Project Management(ITPM)	Mr. Dharamvir	DV
22MCA43	Technical Seminar	Mr. Ashok BP	ABP
22MCA44	Project Work Phase 2	Project Guides	

4<sup>th</sup> B sem faculty names and subjects

SUBCODE	SUBJECT	FACULTY	INITIAL
22MCA412	Big Data Analytics(BDA)	Mrs. Mary Anitha T	MA
22MCA414	Software Project Management(SPM)	Mr. Ashok BP	ABP
22MCA421	IT Project Management(ITPM)	Mr. JC Achutha	JCA
22MCA43	Technical Seminar	Mrs. Mridula Shukla	MS
22MCA44	Project Work Phase 2	Project Guides	

2<sup>nd</sup> A sem faculty names and subjects

SUBCODE	SUBJECT	FACULTY	INITIAL
22MCA21	Database Management System(DBMS)	Mr. Ashok BP	ABP
22MCA22	OOPs using Java(JAVA)	Mrs. Mridula Shukla	MS
22MCA23	Software Engineering(SE)	Mrs. Pankaja Menon	PM
22MCA24	Web Technologies(WT)	Mrs. Sowmya Jayaraj	
22MCA254	User Interface Design(UIID)	Mrs. Mary Anitha T	MA
22MCA263	Mobile Application Development(MA)	Mr. Dharamvir	DV
22MCA29	Technical Seminar(Seminar)	Mentors	





THE OXFORD COLLEGE OF ENGINEERING  
DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS  
Academic Year 2023-2024

2<sup>nd</sup> B sem faculty names and subjects

SUBCODE	SUBJECT	FACULTY	INITIAL
22MCA21	Database Management System(DBMS)	Mr. Ashok BP	ABP
22MCA22	OOPs using Java(JAVA)	Mrs. Mridula Shukla	MS
22MCA23	Software Engineering(SE)	Mrs. Pankaja Menon	PM
22MCA24	Web Technologies(WT)	Mrs. Sowmya Jayaraj	SJ
22MCA254	User Interface Design(UID)	Mrs. Mary Anitha T	MA
22MCA263	Mobile Application Development(MA)	Mr. Dharamvir	DV
22MCA29	Technical Seminar(Seminar)	Mentors	

**HOD-MCA**  
The Head

Department of MCA  
The Oxford College of Engineering,  
Hosur Road, BANGALORE -

**DIRECTOR**  
**DIRECTOR - MBA & MCA**  
The Oxford College of Engineering  
Bommanahalli, Hosur Road,  
Bengaluru-560 068.



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**DEPARTMENT OF MECHANICAL ENGINEERING**  
 ACADEMIC YEAR 2023-2024 (EVEN)

Sl. No	Days	SEMESTER	WEF	ROOM NO	CLASS TEACHER	9.00 to 9.55	9.55 to 10.50	11.00 to 11.55	11.55 to 12.50	1.30 to 2.25	2.25 to 3.20	3.20 to 4.15	
1	MON	4th	05/06/24	501A	Dr. Varun K R	FM (TVN)	NTM (GMR)	S H O R T  B R E A K	MSM (VP)	BFE (TMZ)	Machine Shop Lab (VP)		
		6 <sup>th</sup>	20/03/24	505	Dr. Prasad H Nayak	POM (AU)	MSD (RP)		RE (DV)	MD (PHN)	HMT (VKR)	Club Sctivity (PHN)	
		8th	12/02/24	504	Dr. Raviprakash	Project Work			Project Work		Project Work		
2	TUE	4th	05/06/24	501A	Dr. Varun K R	BFE (TMZ)	FM (TVN)	NTM (GMR)	MSM (VP)	Fluid Mechanics Lab (TVN)			
		6th	20/03/24	505	Dr. Prasad H Nayak	MD (PHN)	POM (AU)	HMT (VKR)	RE (DV)	Innovation/Enterpr eneurship (Vp)		Library	
		8th	12/02/24	504	Dr. Raviprakash	Project Work		Project Work		Project Work			
3	WED	4th	05/06/24	501A	Dr. Varun K R	ATD (VKR)	MSM (VP)	FM (TVN)	BFE (TMZ)	ATD (VKR)	DA (DN)	PED (MSH)	
		6 <sup>th</sup>	20/03/24	505	Dr. Prasad H Nayak	MD (PHN)	HMT (VKR)	RE (DV)	Mentori ng (VP)	Mini Project (GMR)		PED (MSH)	
		8th	12/02/24	504	Dr. Raviprakash	Project Work		Project Work		Project Work			
4	THU	4th	05/06/24	501A	Dr. Varun K R	ATD (VKR)	FM (TVN)	MSM (VP)	BFE (TMZ)	DA (DN)	NTM (GMR)	Mentoring (AU)	
		6 <sup>th</sup>	20/03/24	505	Dr. Prasad H Nayak	POM (AU)	MSD (RP)	MSD (RP)	RE (DV)	3D Printing & CNC Programing (TVN)			
		8th	12/02/24	504	Dr. Raviprakash	Project Work		Project Work		Project Work			
5	FRI	4th	05/06/24	501A	Dr. Varun K R	NTM (GMR)	ATD (VKR)	UHV (RPM)	Library	MMM LAB (TVN)			
		6th	20/03/24	505	Dr. Prasad H Nayak	MD (PHN)	MSD (RP)	POM (AU)	HMT (VKR)	HMT LAB (VKR)			
		8th	12/02/24	504	Dr. Raviprakash	EE (VP)	NDTE (RPM)	EE (VP)	NDTE (RPM)	Technical Seminar Review			
6	SAT	Alternate Saturday weekday timetable									Alternate Saturday weekday timetable		

#### **4th sem Faculty Names & Subjects**

<b>SUB CODE</b>	<b>SUBJECT</b>	<b>FACULTY</b>	<b>INITIAL</b>
BME401	Applied Thermodynamics (ATD)	Dr. Varun K R	VKR
BME402	Machining Science Metrology (MSM)	Dr. Vidyadar Pujar	VP
BME403	Fluid Mechanics (FM)	Mr. T V Nagaraja	TVN
BME405A	Nontraditional Machining (NTM)	Dr. Madhu Sudana Reddy G	GMR
BBOK407	Biology for Engineers (BE)	Dr. Tamizharasi	TMZ
BMEL456A	Data Analytics (DA)	Mrs. Diana	DN
BMEL404	Mechanical Measurements & Metrology Lab (MMM Lab)	Mr. T V Nagaraja	TVN
BUHK408	Universal Human Values(UHV)	Dr. Ravi Prakash	NJK
BPEK459	Physical Education (PE) (Sports and Athletics)	Mr. Mahesh	MH

#### **6th sem Faculty Names & Subjects**

<b>SUB CODE</b>	<b>SUBJECT</b>	<b>FACULTY</b>	<b>INITIAL</b>
21ME61	Production & Operation Management (POM)	Dr. Anup U	AU
21ME62	Heat Transfer (HMT)	Dr. Varun K R	VKR
21ME63	Machine Design (MD)	Dr. Prasad H Nayak	PHN
21EE652	Renewable Energy Resource (RE)	Dr. Devi Vigneswari	DV
21ME642	Mechatronics System Design (MSD)	Dr. Ravi Prakash M	RPM
21MEL66	3D Printing & Cnc Programing Lab (CNC)	Mr. Nagaraja T V	TVN
21MEMP67	Mini Project (MP)	Dr. Madhu Sudana Reddy G	GMR
21MINT68	Innovation/Enterpreneurship/Social Intership (R/E/SI)	Dr. Vidyadar Pujar	VP

#### **8th sem Faculty Names & Subjects**

<b>SUB CODE</b>	<b>SUBJECT</b>	<b>FACULTY</b>	<b>INITIAL</b>
18ME81	Energy Engineering (EE)	Dr. Vidyadhar Pujar	VP
18ME823	Non Destructive Testing and Evaluation (NDTM)	Dr. Raviprakash M	RPM
18MEP83	Project Phase - II	Dr. Raviprakash M	RPM
18MES84	Technical seminar	Dr. Vidyadhar Pujar	VP
18MEI85	Internship	Dr. Prasad H Nayak	PHN

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**DEPARTMENT OF MECHANICAL ENGINEERING**

ACADEMIC YEAR 2023-2024 (ODD)

Sl. No	Days	SEMESTER	WEF	ROOM NO	CLASS TEACHER	9.00 to 9.55	9.55 to 10.50	11.00 to 11.55	11.55 to 12.50	1.30 to 2.25	2.25 to 3.20	3.20 to 4.15	
1	MON	3 <sup>rd</sup>	15 /11/23	505	Dr. Varun K R	MOM (VP)	MSE (TVN)	MP (RN)	BTD (VKR)	MSE (TVN)	SCR (GMR)	BTD (VKR)	
		5 <sup>th</sup>	25/11/23	504	Dr. Vidyadhar	TOM (PHN)	MMAM (PC)	MMAM (PC)	TFE (NR)	TFE LAB (RN)			
		7 <sup>th</sup>	10/09/23	505	Dr. Ravi Prakash	DM (VKR)	MT (PHN)	CADM (AU)	TQM (TVN)	Design Lab (PHN)			
2	TUE	3 <sup>rd</sup>	15 /11/23	505	Dr. Varun K R	BTD (VKR)	MOM (VP)	MSE (TVN)	EHVT (PC)	APP (LAB)(LH)	MENTORING/PED		
		5 <sup>th</sup>	25/11/23	504	Dr. Vidyadhar	FEA (VP)	TOM (PHN)	MMAM (PC)	FEA (VP)	MAT Lab (AU)			
		7 <sup>th</sup>	10/09/23	505	Dr. Ravi Prakash	MT (PHN)	CADM (AU)	MT (PHN)	Mentoring (PHN/RN)	CIM Lab (VP)			
3	WED	3 <sup>rd</sup>	15 /11/23	505	Dr. Varun K R	MP (RN)	BTD (VKR)	EHVT (PC)	MOM (VP)	Introduction to Modeling Design For Manufacturing (LAB) (AU)			
		5 <sup>th</sup>	25/11/23	504	Dr. Vidyadhar	TOM (PHN)	FEA (VP)	RM (GMR)	Mentoring (VP) / Library	Design Lab( (PHN)			
		7 <sup>th</sup>	10/09/23	505	Dr. Ravi Prakash	CE (RPM)	TQM (TVN)	CADM (AU)	DM (VKR)	CE (RPM)	Library	Library	
4	THU	3 <sup>rd</sup>	15 /11/23	505	Dr. Varun K R	MSE (TVN)	MP (RN)	EHVT (PC)	MOM (VP)	Material Testing Lab (TVN)			
		5 <sup>th</sup>	25/11/23	504	Dr. Vidyadhar	FEA (VP)	TOM (PHN)	TFE (NR)	TFE (NR)	FEM LAB (VP)			
		7 <sup>th</sup>	10/09/23	505	Dr. Ravi Prakash	MT (PHN)	DM (VKR)	CE (RPM)	TQM (TVN)	Project Phase 1 (RP)			
5	FRI	3 <sup>rd</sup>	15 /11/23	505	Dr. Varun K R	BTD (VKR)	MOM (VP)	EHVT (PC)	MP (RN)	Foundary Forging Lab (RN)			
		5 <sup>th</sup>	25/11/23	504	Dr. Vidyadhar	TFE (RN)	RM (GMR)	Internship Review (GMR & VP)		MMAM (PC)	ES (HA)	ES (HA)	
		7 <sup>th</sup>	10/09/23	505	Dr. Ravi Prakash	CADM (AU)	DM (VKR)	TQM (TVN)	CE (RPM)	Project Phase 1 (RP)			
6	SAT	Alternate Saturday weekday timetable							Alternate Saturday weekday timetable				

### 3<sup>rd</sup> sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
BME301	Mechanic Of Materials (MOM)	Dr.Vidyadhar Pujar	VP
BME302	Manufacturing Process (MP)	Mr. Raghavendra N	RN
BME303	Material Science And Engineering (MSE)	Mr. T V Nagaraja	TVN
BME304	Basic Thermodynamics (BTD)	Dr. Varun K R	VKR
BMEL305	Introduction To Modelling And Design For Manufacturing (IMDM)	Dr. Anup U	AU
BME306A	Electrical And Hybrid Vechical Technology (EHVT)	Mr. Pradeep P	PC
BSCK307	Social Connect And Responsibility (SCR)	Dr. G Madhu Sudhan Reddy G	GMR
BME358A	Advanced Python Programing (APP)	Ms. Lenish	LH

### 5<sup>th</sup> sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
21ME51	Theory Of Machines (TOM)	Dr. Prasad Nayak H	PHN
21ME52	Thermo-Fluidic Engineering (TFE)	Mr. Raghavendra N	RN
21ME53	Finite Elements Analysis (FEA)	Dr. Vidhyadhar Pujar	VP
21MEL54	Modern Mobility And Automotive Mechanics (MMAM)	Mr. Pradeep C	PC
21MEL55	Design Lab (DL)	Dr. Prasad H Nayak	PHN
21ME56	Research Methodology & Intellectual Property Rights (RM)	Dr. Madhu Sudana Reddy	GMR
21CIV52	Environmental Studies (ES)	Mrs. Harshitha	HA
21ME581	Basics Of Mat Lab (ML)	Dr. Anup Upadhyaya	AU

### 7<sup>th</sup> sem Faculty Names & Subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
18ME71	Controle Engineering	Dr. Ravi Prakash	RPM
18ME72	Computer Aided Design And Manufacturing	Dr. Anup U	AU
18ME734	Professional Elective 2 - Total Quality Management	Mr. Tv Nagaraja	TVN
18ME744	Professional Elective 3 – Mechatronics	Dr. Prasad Nayak	PHN
18EE753	Open Elective - Disaster Management	Dr. Varun K R	VKR
18MEL76	Cim Lab	Dr. Vidyadhar Pujar	VP
18MEL77	Design Lab	Dr. Prasad Nayak	PHN
18MEP78	Project Work Phase 1	Dr. Ravi Prakash	RPM

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 Bommanahalli, Hosur Road, Bangalore - 560068.  
 ☎ 080-61754601/602, Fax: 080 - 25730551 E-mail: [enquiryprincipal@theoxford.edu](mailto:enquiryprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF MECHATRONICS ENGINEERING

Sl.n	Days	SEME STER	WEEK	ROOM NO	CLASS TEACHER	9.00 to 9.55	9.55 to 10.50	S H O R T B R E A K		L U N C H B R E A K		1.30 to 2.25	2.25 to 3.20	3.20 to 4.15
1	MON	3rd	25/10/23	603	JAIDEEP R	ADE (AK)	MSMT (MS)	PP (SV)	MSF (JD)	TOM/D (JD)	PP (SV)	MSF (JD)	PP LAB (SV)	MENTO RING/LI BRARY
2	TUE	3rd	25/10/23	603	JAIDEEP R	MSMT (MS)	PP (SV)	COA (MC)	MSF (JD)	TOM/D (JD)	PP (SV)	MSF (JD)	MT LAB (MS)	NSS/ YOGA
3	WED	3rd	25/10/23	603	JAIDEEP R	ADE (AK)	COA (MC)	MSF (JD)	PP (SV)	TOM/D (JD)	PP (SV)	MSF (JD)	CAMD LAB (AU)	THERMAL LAB (RG)
4	THU	3rd	25/10/23	603	JAIDEEP R	MSF (JD)	COA (MC)	RM/IPR (MC)	ADE (AK)	MSMT (MS)	MSMT (MS)	ADE LAB (AK)	ROBOTICS LAB (MS)	PROJECT WORK
4	THU	5th	25/11/23	604	SEEMA V	TOM/D (JD)	MSST (JD)	RM/IPR (MC)	IA (AK)	VILAB (SV)	MSST LAB (JD)	MSST LAB (JD)	PROJECT WORK	PROJECT WORK
4	THU	7th	11/9/23	606	ANNU KUMARI	AI (JD)	TE (RG)	RM/IPR (MC)	IA (AK)	VILAB (SV)	MSST LAB (JD)	MSST LAB (JD)	PROJECT WORK	PROJECT WORK
4	THU	7th	11/9/23	606	ANNU KUMARI	AI (JD)	TE (RG)	RM/IPR (MC)	IA (AK)	VILAB (SV)	MSST LAB (JD)	MSST LAB (JD)	PROJECT WORK	PROJECT WORK
4	THU	7th	11/9/23	606	ANNU KUMARI	AI (JD)	TE (RG)	RM/IPR (MC)	IA (AK)	VILAB (SV)	MSST LAB (JD)	MSST LAB (JD)	PROJECT WORK	PROJECT WORK





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 Bommanahalli, Hosur Road, Bangalore - 560068.  
 Ph: 080-61754601/602, Fax: 080-25730551 E-mail: [engrprincipal@theoxford.edu](mailto:engrprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

Sl. No.	Day	Date	Faculty	Subject	Class		Activity	Mentoring/Library
					(JD)	(SV)		
5	FRI	3rd	JAIDEEP R	MECHANICS OF SOLIDS AND FLUIDS (MSF)	(JD)	(SV)	CLUB ACTIVITY	MENTORING/LIBRARY
					MSF (JD)	MSMT (MS)		
					PP (SV)	COA (MC)		
		5th	SEEMA V	ANALOG AND DIGITAL ELECTRONICS (ADE)	RM/IPR (MC)	MSST (JD)	CLUB ACTIVITY	EVS (HS)
					TOM/D ME (MS)	CT/VI (SV)		
		7th	ANNU KUMARI	ATERIAL SCIENCE AND MANUFACTURING TECHNOLOGY (MSMST)	TE (RG)	APC (SV)	CLUB ACTIVITY	MENTORING/LIBRARY
					AI (JD)	IR (JD)		
6	SAT	11/9/23	606	COMPUTER ORGANIZATION AND ARCHITECTURE (COA)	Alternate Saturday weekday timetable			
				COMPUTER AIDED MACHINE DRAWING (CAMD)	Alternate Saturday weekday timetable			

3<sup>rd</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
BSC BMT301	MECHANICS OF SOLIDS AND FLUIDS (MSF)	JAIDEEP R	JD
IPCC BMT302	ANALOG AND DIGITAL ELECTRONICS (ADE)	ANNU KUMARI	AK
IPCC BMT303	ATERIAL SCIENCE AND MANUFACTURING TECHNOLOGY (MSMST)	DR. MADHURA	DR.MS
PCC BMT304	COMPUTER ORGANIZATION AND ARCHITECTURE (COA)	DR. MANJULA C	DR.MC
PCCL BMT305	COMPUTER AIDED MACHINE DRAWING (CAMD)	ANUP UPADYAYA	AU
ESC BMT306C	PYTHON PROGRAMMING	SEEMA V	SV
UHV BSCK307	SOCIAL CONNECTR RESPONSIBILITY (SCR)	JAIDEEP R	JD
AEC BMT358A	PROGRAMMING IN PYTHON LAB (PP LAB)	SEEMA V	SV









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5	FRI	4 <sup>th</sup>	22/4/24	603	KUMARI JAIDEEP R	(SV) (MS)	(MS) (MS)	(MS) (SV)	EDC LAB (AK)	SPORTS (MH)
		6 <sup>th</sup>	29/4/24	604	SEEMA V	(AK) (SV)	(SV) (JD)	HP (MF)	MINI PROJECT (MS)	
		8 <sup>th</sup>	12/2/23	606	ANNU KUMARI	(SV) (MS)	(MS) (MS)	AEHV (SV)	INTERNSHIP / SEMINAR	
6	SAT	Alternate Saturday weekday timetable								
Alternate Saturday weekday timetable										

### 4<sup>th</sup> faculty names and subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
PCC BMT401	MICROCONTROLLERS AND APPLICATIONS (MCA)	SEEMA V	SV
IPCC BMT402	ELECTRICAL DRIVES AND CONTROLS (EDC)	ANNU KUMARI	AK
IPCC BMT403	HYDRAULICS AND PNEUMATICS (HP)	JAIDEEP R	JD
PCCL BMT404	MECHATRONICS LAB	SEEMA V	SV
ESC BMT405B	INDUSTRIAL INTERNET OF THINGS (IIOT)	SEEMA V	SV



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AFC	BMT456C	CNC PROGRAMMING AND SIMULATION	Dr. VIDYADHAR PUJAR	Dr. V <sub>p</sub>
BSC	BBOK407	BIOLOGY FOR ENGINEERS (BE)	TAMIZARASI	TR
UHV	BHUK408	UNIVERSAL HUMAN VALUES (UHV)	SEEMA V	SV
MC	BPEK459	PHYSICAL EDUCATION (PE)	MAHESH	MH

6<sup>th</sup> sem faculty names and subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
HSMC 21MT61	CONDITION MONITORING AND MAINTENANCE MANAGEMENT (CMMM)	Dr. MADHURA S	MS
IPCC 21MT62	PLC & SCADA (PLC)	ANNU KUMARI	AK
PCC 21MT63	INDUSTRIAL ROBOTICS (IR)	JAIDEEP R	JD
PEC 21MT64	POWER ELECTRONICS (PE)	SEEMA V	SV
OEC 21EC654	ELECTRONIC CIRCUITS WITH VERILOG (ECV)	MARY FRANCY	MF
PCC 21MTL66	ROBOTICS LAB	JAIDEEP R	JD
MP 21MTMP67	MINI PROJECT	Dr. MADHURA S	MS
INT 21INT68	INTERNSHIP	Dr. MADHURA S	MS



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## 8<sup>th</sup> faculty names and subjects

SUB CODE	SUBJECT	FACULTY	INITIAL
PCC 18MT81	AUTOMOTIVE ELECTRONICS AND HYBRID VEHICLES (AEHV)	Dr. MADHURAS	MS
PCC 18MT824	MANAGEMENT INFORMATION SYSTEM (MIS)	SEEMA V	SV
PROJECT 18MTP83	PROJECT WORK	Dr. MANJULA C / Dr. MADHURAS	MC/MS
SEMINAR 18MTS84	TECHNICAL SEMINAR	ANNU KUMARI	AK
INTERNSHIP 18MTI85	INTERNSHIP	JAIDEPP R	JD

TL

*[Signature]*  
HOD

**Prof. & HOD**

*[Signature]*  
DEAN ACADEMICS

PRINCIPAL

**PRINCIPAL**

Department of Mechatronics  
The Oxford College Of Engineering  
Bommanahalli, Bangalore - 560 068

The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bengaluru-560 068





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### Department of Information Science and Engineering





















#### COURSE FILE PREFACE

Regulation : 2018  
Degree : BE - ISE  
Year / Sem : IV - 8  
Subject Name: 107  
Vision : attached  
Mission : attached

Faculty Name: BAIRAVI.S.M  
Subject Code : BETCK 81  
18CS81

Quality Policy:

S.No	Contents	Staff Sign	HOD Sign
1	Academic Calendar		
2	Expected Learning Outcomes of the Course		
3	Mapping - PO / CO / PEO / PSO		
4	Syllabus of the Course		
5	Lesson Plan		
6	Class Timetable & Individual Timetable		
7	Student Name List		
8	Internal Assessment - I (IA - I) 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO		

9	<b>Internal Assessment - II (IA -II )</b> 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO		
10	<b>Internal Assessment - III (IA -III )</b> 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO		
11	<b>Assignment</b> 1. Assignment Topic 2. Expected Contents 3. Sample Assignments 4. Mark Statements 5. Analysis of PO / CO		
12	<b>End Semester Examination</b> 1. Question Paper 2. Evaluation Key		
13	<b>Question Bank, University Question Papers</b>		
14	<b>Class Notes, PPT &amp; Review by HOD</b>		
15	<b>Related URLs, NPTEL &amp; MOOC Courses</b>		
16	<b>1. Achievement of PO/ CO / PSO of the course</b> <b>2. Internal Marks List based on IA Tests</b> <b>3. University Results</b>		
17	<b>Students Feedback on Teaching</b>		
18	<b>Content Beyond the syllabus - Report</b>		



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## Department of Information Science and Engineering

### COURSE FILE PREFACE

Regulation : 2021

Degree : B.E

Year / Sem : III / 6<sup>th</sup>

Subject Name: Data science & Visualization.

Vision : - Attached -

Mission : - Attached -









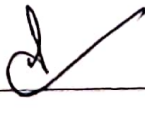
Quality Policy: - Attached -

Faculty Name: A. Diana

Subject Code : 21CS644

S.No	Contents	Staff Sign	HOD Sign
1	Academic Calendar		
2	Expected Learning Outcomes of the Course		
3	Mapping - PO / CO / PEO / PSO		
4	Syllabus of the Course		
5	Lesson Plan		
6	Class Timetable & Individual Timetable		
7	Student Name List		
8	Internal Assessment - I (IA -I) 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO		



9	<b>Internal Assessment - II (IA -II )</b> 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO		4
10	<b>Internal Assessment - III (IA -III )</b> 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO		4
11	<b>Assignment</b> 1. Assignment Topic 2. Expected Contents 3. Sample Assignments 4. Mark Statements 5. Analysis of PO/ CO		4
12	<b>End Semester Examination</b> 1. Question Paper 2. Evaluation Key	NA	
13	<b>Question Bank, University Question Papers</b>		4
14	<b>Class Notes, PPT &amp; Review by HOD</b>		4
15	<b>Related URLs, NPTEL &amp; MOOC Courses</b>		4
16	<b>1. Achievement of PO/ CO / PSO of the course 2. Internal Marks List based on IA Tests 3. University Results</b>		4
17	<b>Students Feedback on Teaching</b>		
18	<b>Content Beyond the syllabus - Report</b>		4



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## Department of Information Science and Engineering

### COURSE FILE PREFACE

Regulation : 2022

Degree : B. E

Year / Sem : 2<sup>nd</sup> year / 4<sup>th</sup> Sem

Subject Name: Advanced Java

Vision : ✓

Mission : ✓

Quality Policy:

Faculty Name: Mr. Karkik Raj S.

Subject Code : ISIS402

S.No	Contents	Staff Sign	HOD Sign
1	Academic Calendar		
2	Expected Learning Outcomes of the Course		
3	Mapping - PO / CO / PEO / PSO		
4	Syllabus of the Course		
5	Lesson Plan		
6	Class Timetable & Individual Timetable		
7	Student Name List		
8	Internal Assessment - I (IA - I) 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO		

9	<b>Internal Assessment - II (IA -II)</b> 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO	<del>PS</del>	H
10	<b>Internal Assessment - III (IA -III)</b> 1. Question Paper 2. Evaluation Key 3. Sample Answer Sheets 4. Mark Statement 5. Analysis of PO / CO	NA	NA
11	<b>Assignment</b> 1. Assignment Topic 2. Expected Contents 3. Sample Assignments 4. Mark Statements 5. Analysis of PO/ CO	<del>PS</del>	H
12	<b>End Semester Examination</b> 1. Question Paper 2. Evaluation Key		
13	<b>Question Bank, University Question Papers</b>	<del>PS</del>	H
14	<b>Class Notes, PPT &amp; Review by HOD</b>	<del>PS</del>	H
15	<b>Related URLs, NPTEL &amp; MOOC Courses</b>	<del>PS</del>	H
16	<b>1. Achievement of PO/ CO / PSO of the course 2. Internal Marks List based on IA Tests 3. University Results</b>		
17	<b>Students Feedback on Teaching</b>	<del>PS</del>	H
18	<b>Content Beyond the syllabus - Report</b>	<del>PS</del>	H





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### DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING


REF. No. TOCE/ECE/DAC/2023-24/ 01

Date: 08/01/2024

#### Department Advisory Committee Meeting

#### Circular

This is to bring it to the kind notice of all DAC committee members that, DAC meeting is scheduled on 10/01/2024 at 9:30 AM in Room. no 401, Department of ECE .Kindly make it convenient to attend the same. A Response mail as a consent is highly appreciated.

  
**Member Secretary**  
Professor & HOD of E&C Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560 068

  
**PRINCIPAL**  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bangalore - 560 068

Copy to:

DAC Chairperson

DAC Members



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### **DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING** **AGENDA FOR DAC MEETING**

- Presentation by HOD on Department performance
- Review of Previous minutes of meeting
- Department Vision and Mission, PSO of Department
- Department Short term and Long-term goals
- Department SWOT
- Academic calendar
- Student centric methods planned
  - Internship
  - Mini-projects
  - Societal based live projects
  - Field work
- Academic gap analysis
- Academic performance analysis and review
  - Review of SEE performance
  - Attainment of CO, PO, PSO
  - Pedagogical initiatives
- Content beyond syllabus activity planned
  - Value added Courses
  - Additional lab experiments
  - Online courses (Swayam & MOOC courses)
  - Skill upgradation activities
- Co-Curricular activities planned
  - Conference/Workshops
  - Placement training
- Industry institute interactions




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- MOU Activities
- Seminar/Symposium
- Guest lecture/Invited lectures
- Collaborative activities initiated
- Research & Innovation
  - Publication-Journal, Book Chapter
  - Research projects
  - Innovation
  - Consultancy
  - IPR-patents, Copyright, Trademark
- Professional Society and Department club activity
- Extra-Curricular activities
- Outreach program
- Sports & Cultural
- Accreditation related activities

  
**Member Secretary**  
Professor & HOD of E&C Engineering  
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### DEPARTMENT OF BIOTECHNOLOGY DAC-Members

S.No	Portfolio	Name and Affiliation
1	Chairperson	Principal: Dr. N. Kannan
2	Member secretary	HOD: Dr. Manju Devi
3	Member (Academic -External)	Name & Designation: Dr. Srinivas Talabattula, Associate Professor Department of Electrical Communication Engineering Affiliation : IISC, Bangalore
4	Member (Industry)	Name & Designation: Mr. Rakesh Bharya Director, Affiliation : Director, Eagle Photonics Pvt.Ltd Bangalore
5	Member (Alumni)	Name & Designation: Mr. Srivatsan Affiliation : Associate System Engineer, DRDO
6	Member (Parents)	Name & Designation: Dr. KR Anil Kumar, Professor and Principal Affiliation : Good shepherd institutions, Affiliated to Bangalore university.
7	Member (Academic-Internal)	Name & Designation: Dr. Preeta Sharan, Dean, R& D Specialization: Optical Communication
8	Member (Academic-Internal)	Name & Designation: Dr. B. Srilatha, Associate Professor Specialization:
9	IQAC-Member	Name & Designation: Dr. Vijayakumari ,Dean Academics

  
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Professor & HOD of E&C Engineering  
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EF. No. TOCE/ECE/DAC/2023-24/ 01

Dated 10/01/2024

### MINUTES OF MEETING

#### MINUTES OF MEETING OF DEPARTMENT ADVISORY COMMITTEE (DAC)

The DAC convened on 10<sup>th</sup> January 2024, from 9:30 AM to 11:30 AM to review the previous committee minutes and strategies for the academic year 2024-25. The meeting was attended by all the DAC committee members. **Member secretary** of DAC **Dr. Manju Devi**, Professor & Head of ECE Department welcomed all DAC members, and presented a brief report on the academic achievements of the department highlighting, students performance in SEE, Faculty performance in teaching learning, research, funded projects, patent filed and product developed. The HOD presented SWOT analysis, long term and short-term goals of the department and explained the strategies planned for the academic year 2024-25.

Member secretary presentation was followed by The **Chairperson** address, **Dr. N. Kannan, Principal** welcomed again all DAC members and appreciated all for sparing their valuable time and requested them to give critical comments and suggestions on strategic plan and their inputs to strengthen the department in teaching learning, pedagogy, research, innovation and entrepreneurship. He expressed his deep sense of gratitude to beloved **Chairman Dr. SNVL Narasimha Raju** for providing the best infrastructure and facility.

After Chairperson address forum was kept open for discussion. Dr. Srinivas Talabattula appreciated the achievements of the department and the effort taken by the HOD and staff. He suggested to focus more on Industry based problems as final year projects and volunteered to support faculty and students through Institutional collaboration.

Mr. Rakesh Bharya Director, Eagle Photonics Pvt. Ltd Bangalore suggested to incorporate value added courses in association with Industry and assured to help to collaborate with Industries.

He suggested to implement strategies and motivate students in scientific writing, review paper writing and appreciated the effort of department in involving students in Manuscript publication and patent filing.

Mr. Srivatsan Associate System Engineer, DRDO Bengaluru, stressed on implementation of special incentives for the students involved in Product development, innovation and startup. He assured to help students in getting internship in DRDO and help faculty in scrutinizing their Innovation for patent filing.



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Dr. KR Anil Kumar, Professor and Principal Good shepherd institutions discussed about how school's curriculum remains relevant and responsive to the needs of the industry, ultimately better equipping students for success in their future careers.

During the Department Advisory Committee (DAC) meeting, the alumni representative provided valuable technical inputs based on their professional experiences post-graduation. Leveraging their expertise in a relevant field, such as technology or engineering, they offered insights on how emerging technologies could be integrated into the curriculum to better prepare students for future careers. They highlighted the importance of teaching practical skills such as coding, data analysis, and digital literacy, which are increasingly in demand in the job market.

Sl. No.	Name	Position in the committee
1	<b>Principal: Dr. N. Kannan</b>	<b>Chairperson</b>
2	HOD: Dr. Manju Devi	Member secretary
3	Name & Designation: Dr. Srinivas Talabattula, Associate Professor Department of Electrical Communication Engineering Affiliation : IISC, Bangalore	Member (Academic -External)
4	Name & Designation: Mr. Rakesh Bharya Director, Affiliation : Director, Eagle Photonics Pvt.Ltd Bangalore	Member (Industry)
5	Name & Designation: Mr. Srivatsan Affiliation : Associate System Engineer, DRDO	Member (Alumni)
6	Name & Designation: Dr. KR Anil Kumar, Professor and Principal Affiliation : Good shepherd institutions, Affiliated to Bangalore university.	Member (Parents)
7	Name & Designation: Dr. Preeta Sharan, Dean, R& D Specialization: Optical Communication	Member (Academic-Internal)
8	Name & Designation: Dr. B. Srilatha, Associate Professor Specialization:	Member (Academic-Internal)
9	Name & Designation: Dr. Vijayakumari ,Dean Academics	IQAC-Member





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### RESOLUTIONS OF DAC MEETING

Based on the discussions and inputs provided during the Department Advisory Committee (DAC) meeting, the following resolutions were adopted:

#### 1. Enhancing Industry-Academia Collaboration:

- The department will prioritize strengthening ties with the Electronic industry through collaboration with academia across colleges in Bengaluru.
- Efforts will be made to encourage industry-based final year projects, fostering practical learning experiences for students.

#### 2. Value-added Courses and Special Incentives:

- Value-added courses in collaboration with industry partners will be incorporated into the curriculum to enhance students skill sets and employability.
- Special incentives will be introduced for students involved in product development, innovation, and startup initiatives to foster a culture of Research, Entrepreneurship and Innovation as per the New Research Policy of the Institute.

#### 3. Visibility and Outreach:

- The department will plan to develop its own webpage, blog, or app to showcase its achievements and increase visibility among stakeholders.
- Regular symposiums, conferences, workshops, and seminar series will be organized in collaboration with industry partners to promote knowledge exchange and networking opportunities.

#### 4. Hands-on Training and Industrial Exposure:

- Efforts will be made to provide students with hands-on training in various platforms and practical skills relevant to their field of study.
- Industrial visits, internships, and hands-on sessions at industry partner facilities will be organized to expose students to real-world challenges and opportunities.

#### 5. Specialized Courses and Training Programs

- Training sessions on different programming languages and other relevant skills will be provided to enhance students' placement opportunities and career readiness.

#### 6. Encourage Collaborative Research:

- Promote collaborative research projects both within the department and with external partners to facilitate knowledge exchange, interdisciplinary perspectives, and greater impact.
- Facilitate collaborations with industry partners, research institutes, and international universities to address real-world problems and enhance the relevance and applicability of research outcomes

#### 7. Establish Research Culture, Mentorship and Guidance:

- Foster a research-oriented culture within the department by promoting the importance of research and publication among faculty and students.



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The DAC approved the department's academic plan, calendar, timetable, SWOT analysis, and action plan for the 2024-25 academic year, reflecting the collective decisions and inputs discussed during the meeting.

### 8. Approval of Academic Plan and Strategy:

These resolutions aim to strengthen the department's academic programs, industry collaborations, and overall student exposure.

  
**Member Secretary**  
Professor & HOD of E&C Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560 068

  
**PRINCIPAL**  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bangalore - 560 068



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**DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS**

## **Circular**

Date:22-04-2024


Department Advisory committee meeting is scheduled on 24th April 2024 at 10.00AM in HOD chamber, MCA dept, 6<sup>th</sup> floor New building.

Agenda:


1. Review of the previous Minutes of Meeting.
  2. Academic Calendar, Master Timetable
  3. Teaching and Learning Process
  4. Even Semester Overall Result Discussion
  5. Course File/Pedagogical Methods
  6. Value Added Courses; Content beyond syllabus
  7. Student Centric Methods
  8. Implementation of OBE
  9. Action Plan for Slow Learners and Advanced Learners
  10. Alumni Interaction and Contribution
  11. Faculty Contribution
  12. Feedback analysis and Action taken plan
- Any other permission of chair.

### **MEMBERS PRESENT:**

Sr.No.	Name	Designation	Position in the Committee
1	Dr Kannan N	Principal	Chair Person
2	Dr.Dharamvir	Professor and HOD	Member Secretary
3	Dr Sarvanan	CSE Member Secretary	Member
4	Mr. Manjunath	GM in STPI	Member
5	Dr Gomathy	MemberSecretary, MCA	Member
6	Mr. Anmol	Self Employed	Member
7	Mr.Raghvendra Gowda	Farmer	Invitee
6	Dr. Selvi	Professor	Member
7	Mr Satyam Jha	Student	Invitee

  
The Head  
Department of MCA  
The Oxford College of Engineering  
Hosur Road, BANGALORE -

Member Secretary

  
PRINCIPAL  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bengaluru-560 068

Chair Person





**DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS**  
**Date : 24.04.2024**  
**DEPARTMENT ADVISORY COMMITTEE**

**MINUTES OF MEETING**

This meeting was held in MCA department library on 24th April 2024 at 10.00 am to 11.30 am.

The following agenda was discussed:-

**1. Review of Previous Meeting:**

Add on courses should be given importance as per earlier meeting  
Industrial visits should be encouraged and should be relevant to the curriculum  
ICT facilities / Pedagogy to be improved

**2. Academic Calendar:**

- As Per the VTU guidelines the academic calendar of the department needs to be prepared
- The time table coordinators are requested to prepare the timetable for the even semester and also allot the various activities in charges.

**Master Time Table:**

The timetable coordinator also requested to prepare the master timetable for all the semester. The draft timetable needs to be submitted to the Principals office through HOD.

**3. Teaching learning Process.**

Presented Curricular gap Identification Process, Curriculum gap Fulfillment ,Innovative Practices and Reforms in Teaching ,Action taken for slow learners, Quality in CIE Test, Laboratory Rubrics for quality Evaluation.

**4. Even Semester Overall Results Discussion:**

Faculty in the department was asked about the pass percentage with respect to their subjects handled and suggested to maintain more than 90%.

**5. Course File/Pedagogical Methods:**

All faculties have to prepare the corresponding course files in accordance to the course file preface. Also they need to mention the ICT tools to be used in their subjects to enhance the teaching and learning process. They need to solve the question papers of previous semester and also to frame the assignments so as to match the teaching learning outcomes.

**6. Value Added Courses, Content beyond syllabus**

Faculties have to identify some value added courses and content beyond the syllabus to fill the gaps and improve the skill set of students.

- Innovation & Design Thinking Opportunities in the field Computer Applications

**7. Student Centric Methods:**

Students should undergo various workshops/ Trainings, NPTEL courses to enhance their knowledge. Also Industrial Visit should be planned to match the curriculum gap. Industrial visit helps them to enhance the industrial needs which help in placement

**8. Implementation of OBE Matrix**

CO-PO-PSO mapping of the attainment of the same for the previous semester was evaluated and unattained targets were discussed and action plan was followed to achieve the target.

**9. Action Plan for Slow learners and Advanced Learners**

After each continuous internal evaluation the class teachers should prepare the remedial timetable and the slow learners should attend the remedial class and all subject teachers need to monitor the slow learners and help them to achieve good results. The advanced learners should be motivated by mentors , class teachers and HODs

**10. Alumni Interaction and Contribution.**

Alumni Interactions and Alumni Suggestions, Alumni Contribution through guest lecture.

**11. Faculty Contribution.**


Cadre proportions, Retention and publications, Faculty Certification course completion details and FDP attended details


**12. Feedback analysis and Action taken plan.**

Feedback on “Curriculum” needs to be taken from all the stake holders and review the same to improve the curriculum delivery.

**MEMBERS PRESENT:**

Sr.No.	Name	Designation	Position in the Committee
1	Dr Kannan N	Principal	Chair Person
2	Dr. Dharamvir	Professor and HOD	Member Secretary
3	Dr Sarvanan	CSE Member Secretary	Member
4	Mr. Manjunath	GM in STPI	Member
5	Dr Gomathy	MemberSecretary, MCA	Member
6	Mr. Anmol	Self Employed	Member
7	Mr.Raghvendra Gowda	Farmer	Invitee
6	Dr. Selvi	Professor	Member
7	Mr Satyam Jha	Student	Invitee

  
The Oxford  
Department of MCA  
The Oxford College of Engineering  
Hosur Road, BANGALORE -  
Member Secretary

  
PRINCIPAL  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bangalore-560 088  
Chair Person

Copy to:

1. Chairman
2. Principal


e-copyto:

1. Dr. Sarvanan
2. Mr. Manjunath
3. Dr Gomathy
4. Mr. Anmol
5. Mr. Raghvendra Gowda
6. Dr. Selvi
7. Mr Satyam Jha



Action Taken for 2023-2024 (EVEN)

Sl.No	MOM no	Action Planned	Status
1	5	New pedagogical initiatives are to be implemented	Pedagogical initiatives were implemented in Teaching learning process.
2	6	Value added courses are planned	As per the plan, value added courses were conducted.
3	7	Internships are made mandatory	Students have successfully completed their internships
4	8	Implementation of OBE	OBE matrix was implemented and followed
5	9	Remedial classes	Remedial classes were conducted for slow learners
6	10	Feedback Analysis	Feedback on curriculum was taken for all the stakeholders and analyzed.

  
10th Floor  
Department of MCs  
The Oxford College of Engineering  
Hosur Road, BANGALORE -  
**Member Secretary**

  
PRINCIPAL  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bangalore-560 006  
**Chair Person**



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Administrative Office:

1<sup>st</sup> Phase, JP Nagar, Bengaluru – 560 078

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TOCE/EST 27/CDC/2023-24/01

Date: 31 Jul. 2023

### **CIRCULAR**

**Sub:** Curriculum Planning and Delivery Committee Meeting

-----

All Heads of Departments (HODs) are hereby informed of a meeting scheduled for the upcoming academic year 2023–2024 (ODD Semester) to discuss curriculum activities across all departments. The meeting will be held on **4<sup>th</sup> August 2023** at **11:00 am** in the **Board Room, The Oxford College of Engineering, Bengaluru.**

The agenda for discussion is as follows:

1. Academic Calendar
2. Master Timetable
3. Course Files/Pedagogical Methods
4. Value Added Courses and Content Beyond the Syllabus
5. Student-Centric Teaching Methods
6. Mapping of Course Outcomes (COs), Programme Outcomes (POs), and Programme Specific Outcomes (PSOs)
7. Feedback Analysis and Action Plan
8. Any other points with the permission of the Chair

Kindly make it convenient to attend the meeting.

  
PRINCIPAL  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bengaluru-560 068

**PRINCIPAL**

Copy to

The Chairman, The Oxford Educational Institutions

All HODs

IQAC



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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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TOCE/EST 27/CDC/2023-24/02

**PROCEEDINGS OF THE MEETING**  
**Curriculum Planning and Delivery Committee**

Date:04-08-2023

Time: 11:00AM

Members Present:

01	Dr. N Kannan - Principal		
02	Dr. Vijaya Kumari -Dean (Academics) & Prof of Dept. of ECE	03	Dr. Preeta Sharan – Dean (R&D) & Prof of Dept. of ECE
04	Dr. R Ch A Naidu - HOD - CSE	05	Dr. R Kanagavalli - HOD - ISE
06	Dr. Manju Devi - HOD - ECE	07	Dr.V S Bharath- HOD - EEE
08	Dr. Madhusudhan Reddy - HOD - ME	09	Dr. B K Manjunath - HOD - BT
10	Dr. Malleshaiah T S - HOD -CIVIL	11	Dr. Raju B R, HOD - Auto
12	Dr. Manjula C – HOD - MTE	13	Dr. Tharaka Rami Reddy - HOD - MBA
14	Dr. Puja Shashi - HOD - MCA	15	Dr. Mallikajuna K - Dean Examinations
16	Dr. P Gangavathi - HOD - S&H	17	Dr. Bheemeswara Reddy V, Head – Corporate Relations
18	Dr. Ravi H, Chief Librarian, Dept. of Central Library	19	Dr. Yasha Jyothi M Shirur – Prof. & Head, Dept. of ECE, BNMIT - Academic Expert - ECE
20	Mr. Shamin Dudu T S– Section Head & Tech Director, Bosch Global Software, Hongasandra, B'lore -Embedded Systems - Industry Expert - EEE	21	Mr. Rakesh L – Senior Consultant, Quisitive Solutions, Supply Chain & Manufacturing – Alumni - ME

## Agenda

- Review of Previous minutes of meeting
- Department Vision and Mission, PSO of Department
- Department Short term and Long term goals
- Department SWOT
- Academic Calendar/Time Table
- **Student centric methods planned**
  - Internship
  - Mini Projects
  - Societal based live projects
  - Field Work
- **Academic gap analysis**
- **Academic performance analysis and review**
  - Review of SEE performance
  - Attainment of CO,PO, PSO
  - Pedagogical initiatives
  - Implementation of OBE Matrix
  - Action Plan for Slow Learners and Advanced Learners
  - Feedback analysis and Action taken plan
- **Content beyond syllabus activity planned**
  - Value added Courses
  - Additional lab experiments
  - Online courses (Swayam & MOOC courses)
  - Skill up gradation activities

The following points were discussed during CDC meeting:

1. Principal welcomed all the members present and the resolution planned in the last meeting has been approved for compliance.
2. **Department Vision and Mission, PSO of Department/Department Short term and Long term goals/Department SWOT:**  
The committee instructed to review and discuss in the DAC regarding the Department Vision and Mission, PSO, Department Short term and Long term goals and SWOT analysis.
3. The academic performance analysis of last semester (2022-23EVEN) was briefed by principal.

As per the VTU guidance the 7<sup>th</sup>semester of B.E. will commence from 14/08/2023.

#### 4. **Academic Calendar:**

The principal briefed the following dates for the commencement of ODD semester as per the VTU Calendar along with College Academic Calendar

Semester	VTU Calendar	TOCE Calendar
BE - VII	Sept. 11th 2023	Sept. 11th 2023
BE - V	Oct. 25th2023	Nov. 25th 2024



<b>BE - III</b>	Oct. 25th 2023	Nov. 15th 2023
<b>BE - I</b>	Sept. 4th 2023	Sept. 4th 2023
<b>MTech- Isem</b>	Feb. 12th 2024	Feb. 12th 2024
<b>MTech- IIIsem</b>	Dec. 11th 2023	Dec. 11th 2023
<b>MBA - I</b>	Feb. 12th 2024	Feb. 12th 2024
<b>MBA - III</b>	Dec. 1st 2023	Dec. 1st 2023
<b>MCA - I</b>	Feb 12th 2024	Feb 12th 2024
<b>MCA - III</b>	Dec. 11th 2023	Dec. 11th 2023

The principal instructed the HODs to prepare the department calendar for the semester activities by incorporating all the important events and finalize the dates.

**Time Table/Master Time Table:** It is informed to all the HoDs to prepare subject proficiency matrix as per 2018, 2021,2022 schemes and prepare the department time table and master time table for the ODD semester and submit to the principal office. A copy of the mentor allocation list needs to be attached for each section.

## 5. Students Centric Methods

The curriculum delivery committee decided to integrate student-centric methods to enhance learning outcomes. Heads of Departments were instructed to ensure the implementation of these methods in teaching practices, including guest lectures, expert talks, technical seminars and webinars, hands-on sessions, interactive sessions, soft skill and technical training, industrial and field visits, internships, projects, mini-projects, Societal based live projects and innovative approaches. According to the VTU circular, students must be encouraged to pursue the B.E. Honors course with a minimum CGPA of 7.5.

## 6. Academic performance analysis and review

### SEE Review Meeting

He also reviewed the results of CIE and Semester End Examination for each branch. It was also noted that the some 10% of results were improved (expected target in results were not satisfied and could have achieved good results for which) the committee members were advised all HODs and subject faculty to aim for better results improve the same during the upcoming academic year 2023-24 ODD.

It was also noted that students' performance and subject deliverance by the faculty must be improved. HODs were advised to prepare a remedial class time table for the slow learners and instruct the faculty to conduct the remedial classes for the further improvements. by adopting innovative pedagogical methods.

### CIE Review Meeting:

HoDs were informed to direct the subject faculty to maintain the course file for their respective subjects and get it verified before the commencement of the semester.

The course file should contain a copy of university syllabus, students list, attendance register, teacher's diary along with the lesson plan, execution of the content delivery, pedagogical

initiatives, notes and reference books, previous CIE question papers and university question papers along with scheme of evaluation and question bank, assignments etc.,

Faculty should follow the pedagogical methods given by the university along with the syllabus. In addition, faculty were advised to follow their innovative pedagogical initiatives as demanded by the subject domain. The committee members suggested to conduct class committee meeting before the commencement of each Continuous Internal Evaluation (CIE) and to submit the report to IQAC.

The committee members advised HODs to instruct each faculty to adhere the VTU guidelines for conducting CIE and also advised HODs to have thorough check on the CIE question paper pattern. Also, the committee members discussed that as per the 2018 scheme, the rubrics for allotment of marks are 60 marks for Semester End Exam (SEE) and 40 marks for Continuous Internal Evaluation (CIE). In 40 marks of Internal Assessment, 30 marks are awarded as the average of 3 Internal Assessments and 10 marks for the Assignments which are considered awarding for the final IA marks. Also, an opportunity can be given to the students who need IA average in the form of Improvement Test.

And for the 2021 & 2022 scheme, BE - First year, the rubrics for allotment of marks is 50% marks for Semester End Exam (SEE) and 50% marks for Continuous Internal Evaluation (CIE). As per the 2018 scheme for MCA, the rubrics for the allotment of marks are 80 marks for Semester End Exams and 20 marks for Internal Tests. With 20 marks for the Internal test, 60% for the average of three internal test marks and 40% for the Assignment marks should be considered for awarding of the final Internal Test marks of the Master of Computer Applications. And for 2020 scheme, the rubrics for the allotment of marks are 60% marks for Semester End Exams and 40% marks for Internal tests.

As per the 2020 scheme of MBA, the rubrics for the allotment of marks are 60% marks for End Semester Exams and 40% marks for Internal Tests. With 25 marks on the Internal Test, average of best of 2 out of 3 IA, 15 marks for Assignments / Presentation / Seminars depending on the subjects.

As per the 2020 scheme of MTech, the rubrics for the allotment of marks are 60% marks for End Semester Exams and 40% marks for Internal Tests. With 20 marks on the Internal Test, average of 3 IA, and 20 marks for Assignments / Presentation / Seminars depending on the subjects. And for the 2022 scheme, MTech, the rubrics for allotment of marks is 50% marks for Semester End Exam (SEE) and 50% marks for Continuous Internal Evaluation (CIE).

Faculty were advised to evaluate the blue books within the stipulated duration and after each CIE, the slow learners need to be identified and conduct remedial class.

### **Pedagogical Initiatives**

HODs were advised to instruct the subject faculty that they should incorporate pedagogical methods like Group Discussion, Industrial Visits, MCQs, role play, Quiz, peer to peer learning, brain storming, model based, Industrial Visit, and PPTs for better insight of the concepts for healthier understanding.

## **Implementation of OBE Matrix**

The members took the decision regarding the COs, POs and PSOs of the programs and for implementing appropriate pedagogic strategies. Also informed that the Course outcomes are designed as per the affiliating university prescribed syllabus and by employing Bloom's taxonomy verbs and levels. It was also informed that all the Courses have around five course outcomes and these are correlated to the Program Outcomes (POs). The members also discussed the process of mapping of COs prescribed by VTU and POs prescribed by the NBA related for the course.

HODs were advised to instruct the faculty that the mapping should be based on the scaling parameter which is as defined by NBA and are as follows: -

“1” – Slight (Low) correlation, “2” – Moderate (Medium) Correlation, “3” – Substantial (High) correlation and “-” indicates there is no correlation. Similarly, COs with PSOs should be mapped to achieve the attainments.

### **Action Plan for Slow learners and Advanced Learners**

The curriculum delivery committee directed Heads of Departments to ensure that subject faculty conduct remedial classes and mentoring sessions for students who require additional support. Additionally, they advised encouraging advanced learners to engage in conferences, add-on courses, and MOOCs to deepen their understanding of the subject matter, thereby enhancing their chances of achieving university rankings.

### **Feedback analysis and Action taken plan.**

The committee instructed feedback committee to adhere to the format given by IQAC and to take feedback on ‘Curriculum’ for the academic year 2023-24 (ODD) from the following stakeholders after the 2<sup>nd</sup> IA.

- a) Students
- b) Faculty
- c) Course End Survey
- d) Program Exit Survey
- e) Alumni
- f) Employers

An analysis report of the feedback should be submitted to IQAC. HODs and Feedback committee members are advised to analyze the outcome based on the student's feedback on faculty and should submit the action plan and the same will be discussed in the next meeting. Like faculty who secured greater than 90% are to be appreciated and those who scored less than or equal to 75% need to take immediate necessary action. Such faculty need to undergo and enhance training/FDP/Workshop/Seminars etc. to upgrade their skills.

## **7. Content beyond syllabus activity planned**

**Value Added Courses, Content beyond syllabus:** The curriculum delivery committee discussed with HoDs of all the department to conduct value added courses for the academic year 2023-24(ODD).

SL NO	Name of Add on /Certificate programs offered	Duration of course
1	Foundations of Quantum Computing: A 6-Days Value - Added Course	36
2	Cyber Security and Ethical Hacking	30
3	Hands on Training Data Analytics using Excel	30
4	Applications of Python Programming & Networking in Electrical Engineering	30
5	Innovation and Design Thinking Ideas in Structural Detailing	30
6	Mech Design Mastery: Crafting Excellence in Product Innovation	36
7	R& D Innovation in Clinical Genomics	30
8	Python for Mechatronics Engineering	30
9	Data Analytics Using ML	90
10	Leveraging Python for Business Insights and Strategic Decision-Making	30
11	Java Full Stack	30

The Committee members reviewed the above-mentioned courses and approved the same.


8. The Committee instructed all HoDs to inculcate Research culture among students and faculty / through invited lectures collaboration with MoU signed companies and brain storming sessions. Students/Faculty Innovation should be motivated through assigning live project addressing societal issues.
9. **DAC:** Principal instructed all department, Department Advisory Committee, to conduct the meeting with stakeholders, and identify the curriculum gap, review the stakeholder's remarks, and identify the thrust areas to bridge the gap.
10. **B.E Honors:** As per VTU circular and guidance it was discussed during HoDs meeting to give importance and awareness of B.E honors and motivate the students for the same. Principal directed to conduct the meeting for the same in their respective department.
11. Principal also suggested the importance of Cross Cutting Issues in syllabus by giving the awareness of Ethics, Gender, Environment, etc. This needs to be shared with faculty and students.



## 12. Resolutions

### Following resolutions were made in the meeting:

1. To retain the institution vision and mission statements and to review the department vision and mission statements/SWOT/Long term and short term in the DAC
2. All faculty should strictly adhere to VTU/Institute/Department academic calendar and follow the approved activity plan
3. All faculty should maintain their course file duly verified and approved by respective HODs before the commencement of the classes
4. The faculty should implement the pedagogy initiatives as per the VTU guidelines
5. To conduct the bridge course/add on course/industrial visit/workshops/Internship/Field Visits as per the Department **Academic gap analysis**
6. Academic Performance Analysis should be conducted periodically
7. Students should be encouraged to take up online courses and skill up programs
8. Faculty and Students are encouraged to involve in research, innovation, publications and patents



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The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bengaluru- 560 088

**PRINCIPAL**

Copy to:  
The Chairman, The Oxford Educational Institutions  
All HODs.  
IQAC

## **ACTION PLAN REPORT (2023-24-ODD)**

<b>SL.NO.</b>	<b>MOM – No.</b>	<b>ACTION PLANNED</b>	<b>STATUS</b>
1.	5	<b>Students Centric Methods</b>	The student's centric methods were incorporated in all departments
2.	6	<b>Academic performance analysis</b>	CIE & SEE results were analysed reviewed
3.	6	<b>Course File / Pedagogical Methods</b>	As directed it was implemented by all departments
4.	6	<b>Implementation of OBE Matrix</b>	OBE Matrix was followed by all departments
5.	6	<b>Action Plan for Slow learners and Advanced Learners</b>	Remedial classes were conducted for slow learners & the advanced learners to participate in various programmes
6.	6	<b>Feedback analysis</b>	Feedback was taken by all departments during the semester
7.	7	<b>Content beyond syllabus</b>	As per the plan it was implemented
8.	9	<b>DAC</b>	DAC meeting was conducted before the beginning of the semester in all departments

  
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The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bengaluru - 560 068



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Administrative Office:

1<sup>st</sup> Phase, JP Nagar, Bengaluru – 560 078

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TOCE/EST 27/CDC/2023-24/03

Date: 20.02.2024

### **CIRCULAR**

**Sub: Curriculum Planning and Delivery Committee Meeting**

-----

All Heads of Departments (HODs) are hereby informed of a meeting scheduled for the upcoming academic year 2023–2024 (EVEN Semester) to discuss curriculum activities across all departments. The meeting will be held on **26<sup>th</sup> February 2024** at **11:00 am** in the **Board Room, The Oxford College of Engineering, Bengaluru.**

The agenda for discussion is as follows:

1. Academic Calendar
2. Timetable / Master Timetable
3. Course Files/Pedagogical Methods
4. Value Added Courses and Content Beyond the Syllabus
5. Student-Centric Teaching Methods
6. Mapping of Course Outcomes (COs), Programme Outcomes (POs), and Programme Specific Outcomes (PSOs)
7. Feedback Analysis and Action Plan
8. Any other points with the permission of the Chair

Kindly make it convenient to attend the meeting.

  
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**PRINCIPAL**

Copy to

The Chairman, The Oxford Educational Institutions

All HODs

IQAC



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TOCE/EST 27/CDC/2023-24/04

**PROCEEDINGS OF THE MEETING**  
**Curriculum Planning and Delivery Committee**

Date:26-02-2024

Time: 11:00AM

Members Present:

01	Dr. N Kannan - Principal		
02	Dr. Vijaya Kumari - Dean (Academics) & Prof of Dept. of ECE	03	Dr. Preeta Sharan – Dean (R&D) & Prof of Dept. of ECE
04	Dr. E Saravana Kumar - HOD - CSE	05	Dr. R Kanagavalli - HOD - ISE
06	Dr. Manju Devi - HOD - ECE	07	Dr. Devi Vigneswari - HOD - EEE
08	Dr. Madhusudhan Reddy - HOD - ME	09	Dr. B K Manjunath - HOD - BT
10	Dr. Malleshaiah T S - HOD - CIVIL	11	Dr. Raju B R, HOD - Auto
12	Dr. Madhura S – HOD - MTE	13	Dr. Tharaka Rami Reddy - HOD - MBA
14	Dr. Dharamvir - HOD - MCA	15	Dr. Mallikajuna K - Dean Examinations
16	Dr. P Gangavathi - HOD - S&H	17	Dr. Bheemeswara Reddy V, Head – Corporate Relations
18	Dr. Ravi H, Chief Librarian, Dept. of Central Library	19	Dr. Rajeswari – Professor, Dayananda Sagar College of Engineering - Academic Expert - ISE
20	Mr. Shyamasundar G C, Project Manager, EVIDEN, ATOS Business, B'lore- Industry Expert - CSE	21	Mr. Rakesh R, Assistant Facility Manager, Ejadah, Dubai - Alumni - MT

**Agenda**

- Review of Previous minutes of meeting
- Department Vision and Mission, PSO of Department
- Department Short term and Long term goals
- Department SWOT
- Academic Calendar/Time Table
- Student centric methods planned
  - Internship
  - Mini Projects



- Societal based live projects
- Field Work
- **Academic gap analysis**
- **Academic performance analysis and review**
  - Review of SEE performance
  - Attainment of CO, PO, PSO
  - Pedagogical initiatives
  - Implementation of OBE Matrix
  - Action Plan for Slow Learners and Advanced Learners
  - Feedback analysis and Action taken plan
- **Content beyond syllabus activity planned**
  - Value added Courses
  - Additional lab experiments
  - Online courses (Swayam & MOOC courses)
  - Skill upgradation activities

The following points were discussed during CDC meeting:

1. Principal welcomed all the members present and the resolution planned in the last meeting has been approved for compliance.
2. The performance analysis of last semester (2023-24 ODD) was briefed by principal.

As per the VTU guidance the 2<sup>nd</sup> semester of B.E. was commenced on 6/3/2024, and for 1<sup>st</sup> semester of PG - MBA, MCA, MTech commenced on 12-02-2024.

He also reviewed the results of CIE and Semester End Examination for each branch. It was also noted that the expected target in results were not satisfied and could have achieved better results for which the committee members were advised all HODs and subject faculty to improve the same during the coming academic year 2023-24 Even.

It was also noted that students' performance and subject deliverance by the faculty must be improved. HODs were advised to prepare a time table for remedial class for the slow learners and instruct the faculty to conduct the classes by adopting innovative pedagogical methods.

### 3. Academic Calendar:

The principal briefed the following dates for the commencement of Even semester as per the VTU guidelines

Semester	VTU	TOCE
<b>VIII</b>	Feb 12th 2024	Feb 12th 2024
<b>V1</b>	April 29th 2024	April 29th 2024
<b>IV</b>	April 22nd 2024	April 22nd 2024
<b>II</b>	March 6th 2024	March 6th 2024
<b>M.Tech- II sem</b>	Jul. 15th 2024	Jul. 15th 2024
<b>M.Tech- IV sem</b>	Apr. 22nd 2024	Apr. 22nd 2024
<b>MBA - II</b>	Jul. 15th 2024	Jul. 15th 2024
<b>MBA - IV</b>	Jun. 10th 2024	Jun. 10th 2024

MCA -II	Feb 12th 2024	Feb 12th 2024
MCA -IV	Apr. 22nd 2024	Apr. 22nd 2024

The principal instructed the HODs to prepare the department calendar for the semester activities and HODs were advised to submit it and incorporating all the important academic activities and events by finalizing the date.

**Time Table/Master Time Table:** It is informed to all the HoDs to prepare subject proficiency matrix as per 2018, 2021, 2022 schemes and prepare the department time table and master time table for EVEN semester.

The committee informed to HODs of MBA, MCA and all MTech to prepare a subject proficiency matrix and allocate the subject for the ODD Semester 2023-24 with the 2022 scheme for the first year, and second year for 2021 scheme of the Master of Technology (M.Tech) PG Programme. Department time table along with the Master time table should be submitted to the principal office. A copy of the mentor allocation needs to be attached for each section.

#### 4. Course File / Pedagogical Methods:

HoDs were informed to direct the subject faculty to maintain the course file for their respective subjects and get it verified before the commencement of the semester.

The course file should contain a copy of university syllabus, students list, attendance register, teacher's diary along with lesson plans with pedagogical initiatives, notes and reference books, previous CIE question papers and university question papers along with scheme of evaluation and question bank, assignments etc.,

Faculty should follow the pedagogical methods given by the university along with the syllabus. In addition, faculty were advised to follow their innovative pedagogical initiatives as demanded by the subject domain. The committee members instructed HODs to conduct class committee meeting before the commencement of each Continuous Internal Assessments and to submit the report to IQAC.

The committee members advised HODs to instruct each faculty to adhere the VTU guidelines for conducting Internal Assessment Tests and also advised HODs to have thorough check on the IA question paper pattern.

Also, the committee members discussed that as per the 2018 scheme, the rubrics for allotment of marks are 60 marks for Semester End Exam (SEE) and 40 marks for Continuous Internal Evaluation (CIE). In 40 marks of Internal Assessment, 30 marks are awarded as the average of 3 Internal assessments and 10 marks for the Assignments which are considered awarding for the final IA marks. Also, an opportunity can be given to the students who need IA average in the form of Improvement test.

And for the 2021 & 2022 scheme, BE - First year, the rubrics for allotment of marks is 50% marks for Semester End Exam (SEE) and 50% marks for Continuous Internal Evaluation (CIE).

As per the MCA for 2018 scheme, the rubrics for the allotment of marks are 80 marks for Semester End Exams and 20 marks for Internal tests. With 20 marks for the Internal test, 60% for the average of three internal test marks and 40% for the Assignment marks should be considered for awarding of the final Internal Test marks of the Master of Computer Applications. And for 2020 scheme, the rubrics for the allotment of marks are 60% marks for Semester End Exams and 40% marks for Internal tests.

As per the 2020 scheme of MBA, the rubrics for the allotment of marks are 60% marks for End Semester Exams and 40% marks for Internal Tests. With 25 marks on the Internal test, average of best of 2 out of 3 IA, 15 marks for Assignments / Presentation / Seminars depending on the subjects.

As per the 2020 scheme of MTech, the rubrics for the allotment of marks are 60% marks for End Semester Exams and 40% marks for Internal Tests. With 20 marks on the Internal test, average of 3 IA, and 20 marks for Assignments / Presentation / Seminars depending on the subjects and for the 2022 scheme, MTech, the rubrics for allotment of marks is 50% marks for Semester End Exam (SEE) and 50% marks for Continuous Internal Evaluation (CIE).

Faculty were advised to evaluate the blue books within the stipulated duration and after each internal assessment, the slow learners need to be identified for the conduct of bridge course.

HODs were advised to instruct the subject faculty that they should incorporate pedagogical methods like group discussion, Industrial visits, MCQs, role play, Quiz, peer to peer learning, brain storming, model based, Industrial visit, and PPTs for better insight of the concepts for improved understanding.

5. B.E Honors: As per VTU circular and guidance it was discussed during HoDs meeting to give importance and awareness of B.E honors and motivate the students for the same. Principal instructed to conduct the meeting for the same in their respective department.
6. Principal also suggested the importance of Cross Cutting Issues in syllabus by giving the awareness of Ethics, Gender, Environment, etc. This needs to be shared with faculty and students.
7. **Value Added Courses, Content beyond syllabus:** The curriculum delivery committee discussed with HoDs of all the department to conduct value added courses for the academic year 2023-24 (EVEN).

Sl. No	Name of Add on /Certificate programs offered	Duration of course
1	Edge Computing: A 6-Days Value - Added Course	36
2	Internet of things	30
3	3D PRINTING	30
4	Structured Query Language	30
5	Innovation and Design Thinking Ideas in Construction by using Geo-polymer Concrete	30
6	Innovative Interfaces: Mastering Design Software in Product Development	36
7	Value added course on R programming and Bio python for Biologists	36
8	Advanced in SOLIDWORKS	30
9	AWS FUNDAMENTAL COMPUTING RESEARCH PERSPECTIVE	32
10	Hands on Workshop using Power BI & MS Excel Advanced	30
11	Advance Application Development using Spring and Spring Boot	30

The Committee members reviewed the above-mentioned courses and approved the same.

## **8. Feedback analysis and Action taken plan.**

The committee instructed feedback committee to adhere to the format given by IQAC and to take feedback on 'Curriculum' for the academic year 2023-24 (Even) from the following stakeholders after the 2<sup>nd</sup> IA.

- a) Students
- b) Faculty
- c) Course End Survey
- d) Program Exit Survey
- e) Alumni
- f) Employers

An analysis report of the feedback should be submitted to IQAC. HODs and Feedback committee members are advised to analyze the outcome based on the student's feedback on faculty and should submit the action plan and the same will be discussed in the next meeting. Like faculty who secured greater than 90% are to be appreciated and those who scored less than or equal to 75% need to take immediate necessary action. Such faculty need to undergo and enhance training/FDP/Workshop/Seminars etc. to upgrade their skills.

## **9. Implementation of OBE Matrix**

The members took the decision regarding the COs, POs and PSOs of the programs and for implementing appropriate pedagogic strategies. Also informed that the Course outcomes are designed as per the affiliating university prescribed syllabus and by employing Bloom's taxonomy verbs and levels. It was also informed that all the Courses have around five course outcomes and these are correlated to the Program Outcomes (POs). The members also discussed the process of mapping of COs prescribed by VTU and POs prescribed by the NBA related for the course.

HODs were advised to instruct the faculty that the mapping should be based on the scaling parameter which is as defined by NBA and are as follows: -

"1" – Slight (Low) correlation, "2" – Moderate (Medium) Correlation, "3" – Substantial (High) correlation and "-" indicates there is no correlation. Similarly, COs with PSOs should be mapped to achieve the attainments.

## **10. Students Centric Methods**

The curriculum delivery committee decided to integrate student-centered methods to enhance learning outcomes. Heads of Departments were instructed to ensure the implementation of these methods in teaching practices, including guest lectures, expert talks, technical seminars and webinars, hands-on sessions, interactive sessions, soft skill and technical training, industrial and field visits, internships, projects, mini-projects, and innovative approaches. According to the VTU circular, students must be encouraged to pursue the B.E. Honors course with a minimum CGPA of 7.5.

## **11. Action Plan for Slow learners and Advanced Learners**

The curriculum delivery committee directed Heads of Departments to ensure that subject faculty conduct remedial classes and mentoring sessions for students who require additional support. Additionally, they advised encouraging advanced learners to engage in conferences, add-on courses, and MOOCs to deepen their understanding of the subject matter, thereby enhancing their chances of achieving university rankings.



**12. Department Vision and Mission, PSO of Department/Department Short term and Long term goals/Department SWOT:**

The committee instructed to review and discuss in the DAC regarding the Department Vision and Mission, PSO, Department Short term and Long term goals and SWOT analysis.

**13.** The Committee instructed all HoDs to inculcate Research culture among students and faculty / through invited lectures collaboration with MoU signed companies and brain storming sessions. Students/Faculty Innovation should be motivated through assigning live project addressing societal issues

**14. DAC:** Principal instructed all department, Department Advisory Committee, to conduct the meeting with stakeholders, and identify the curriculum gap, review the stakeholder's remarks, and identify the thrust areas to bridge the gap.

**15. Resolutions**

**Following resolutions were made in the meeting:**

1. To retain the institution vision and mission statements and to review the department vision and mission statements/SWOT/Long term and Short term in the DAC
2. All faculty should strictly adhere to VTU/Institute/Department academic calendar and approved activity plan
3. All faculty should maintain their course file duly verified and approved by respective HODs before the commencement of the classes
4. The faculty should implement the pedagogy initiatives as per the VTU guidelines
5. To conduct the bridge course/add on course/industrial visit/workshops/Internship/Field Visits as per Department Academic gap analysis
6. Academic Performance Analysis should be conducted periodically
7. Students should be encouraged to take up online courses and skill up programs
8. Faculty and Students are encouraged to involve in research, innovation, publications and patents.

  
**PRINCIPAL**  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bengaluru - 560 088

**PRINCIPAL**

Copy to:  
The Chairman, The Oxford Educational Institutions  
All HODs.  
IQAC

## **ACTION PLAN REPORT (2023-24-EVEN)**

<b>SL.NO.</b>	<b>MOM – No.</b>	<b>ACTION PLANNED</b>	<b>STATUS</b>
1.	4	<b>Course File / Pedagogical Methods:</b>	As directed it was implemented by all departments
2.	7	<b>Value Added Courses, Content beyond syllabus</b>	As per the plan it was implemented
3.	8	<b>Feedback analysis</b>	Feedback was taken by all departments during the semester
4.	9	<b>Implementation of OBE Matrix</b>	OBE Matrix was followed by all departments
5.	10	<b>Students Centric Methods</b>	The student's centric methods were incorporated in all departments
6.	11	<b>Action Plan for Slow learners and Advanced Learners</b>	Remedial classes were conducted for slow learners & the advanced learners to participate in various programmes.
7.	14	<b>DAC</b>	DAC meeting was conducted before the beginning of the semester in all departments

  
**PRINCIPAL**  
The Oxford College of Engineering  
Bommanahalli, Hosur Road  
Bengaluru - 560 088



## CHILDREN'S EDUCATION SOCIETY (Regd.)

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

**THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))

Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551

E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF AIML

#### LESSON PLAN

**Faculty Name: SHWETHA P R**

**Academic Year: 2023- 2024-EVEN SEM**

**SUB.CODE &Name: BUHK408/Universal Human Values (UHV)**

**Year/Sem/Section: II/VI/AIML**

**COURSE OBJECTIVES** This course will enable the students to

- To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.
- This course is intended to provide a much-needed orientation input in value education to the young enquiring minds.

**COURSE OUTCOMES:** At the end of the course, the student will be able to:

<b>CO1</b>	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
<b>CO2</b>	They would have better critical ability.
<b>CO3</b>	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
<b>CO4</b>	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

SL.NO	Planned	TOPICS TO BE COVERED	Execution		Pedagogy
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	<b>Date</b>	<b>Hr</b>		<b>Date</b>	<b>Hr</b>	<b>Text /Reference Book</b>	<b>(as per the syllabus)</b>
<b>1.</b>	23/04/24	4	Introduction to Value Education : Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education) Understanding Value Education,	23/04/24	4	Textbook 1	Blackboard
<b>2.</b>	30/04/24	4	Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations,	30/04/24	4	Textbook 1	Blackboard
<b>3.</b>	07/05/24	4	Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations	07/05/24	4	Textbook 1	Blackboard
<b>4.</b>	14/05/24	4	Harmony in the Human Being : Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body,	14/05/24	4	Textbook 1	Blackboard
<b>5.</b>	21/05/24	4	The Body as an Instrument of the Self, Understanding Harmony in the Self, Harmony of the Self with the Body, Programme to ensure self-regulation and Health	21/05/24	4	Textbook 1	Blackboard
<b>6.</b>	28/05/24	4	Harmony in the Family and Society : Harmony in the Family – the Basic Unit of Human Interaction, 'Trust' – the Foundational Value in Relationship, 'Respect' – as the Right Evaluation,	28/05/24	4	Textbook 1	Blackboard
<b>7.</b>	04/06/24	4	Other Feelings, Justice in Human-to Human Relationship, Understanding Harmony in the Society, Vision for the Universal Human Order	04/06/24	4	Textbook 1	Blackboard
<b>8.</b>	11/06/24	4	Harmony in the Nature/Existence : Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature,	11/06/24	4	Textbook 1	PPT
<b>9.</b>	18/06/24	4	Realizing Existence as Co-existence at All Levels, The	18/06/24	4	Textbook 1	Blackboard



			Holistic Perception of Harmony in Existence				
10.	25/06/24	4	Implications of the Holistic Understanding – a Look at Professional Ethics : Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct,	25/06/24	4	Textbook 1	Blackboard
11.	02/07/24	4	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order,	02/07/24	4	Textbook 1	PPT
12.	09/07/24	4	Competence in Professional Ethics Holistic Technologies, Production Systems and Management Models-Typical Case Studies, Strategies for Transition towards Value-based Life and Profession	09/07/24	4	Textbook 1	Blackboard
13.	16/07/24	4	Previous year qp discussion	16/07/24	4	Textbook 1	PPT
14.	23/07/24	4	MQP -DISCUSSION	23/07/24	4	Textbook 1	PPT
15.	30/07/24	4	REVISION	30/07/24	4	Textbook 1	Blackboard

### CONTINUOUS INTERNAL EXAM

SL NO	NAME	DATES
1	CIE-1	10/6/24 - 12/06/24
2	CIE-2	29/7/24 - 31/7/24

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	CCE-1 from the above list	15/5/2024
2	CCE-2 from the above list	5/6/2024

**Textbooks:**

1. a. The Textbook A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978 93-87034- 47-1
2. The Teacher's Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G

**Faculty**

HEAD OF THE DEPARTMENT  
DEPARTMENT OF AIML  
HE OXFORD COLLEGE OF ENGINEERING  
Bengaluru-560068



## CHILDREN'S EDUCATION SOCIETY (Regd.)

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☐: 080-61754501 – 502 Fax: 080-2654 8658

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☐: 080 -61754601/602, Fax: 080 – 25730551

E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Faculty Name: SHWETHA P R**

**Academic Year: 2023- 2024-EVEN SEM**

**SUB.CODE & Name: 21EE652/ RENEWABLE ENERGY RESOURCES**

**Year/Sem/Section: III/VI AIML**

**COURSE OBJECTIVES** This course will enable the students to

- To discuss causes of energy scarcity and its solution, energy resources and availability of renewable energy.
- To explain sun – earth geometric relationship, Earth – Sun Angles and their Relationships.
- To discuss solar energy reaching the Earth's surface and solar thermal energy applications.
- To discuss types of solar collectors, their configurations, and their applications.
- To explain the components of a solar cell system, equivalent circuit of a solar cell, its characteristics, and applications.
- To discuss benefits of hydrogen energy, production of hydrogen energy, storage its advantages and disadvantages.
- To discuss wind turbines, wind resources, site selection for wind turbine.
- To discuss geothermal systems, their classification and geothermal based electric power generation
- To discuss waste recovery management systems, advantages and disadvantages.
- To discuss biomass composition, production, types of biomass gasifiers, properties of producer gas benefits.
- To discuss tidal energy resources, energy availability, power generation.
- To explain motion in the sea wave, power associated with sea wave and energy availability and the devices for harnessing wave energy.

**COURSE OUTCOMES:** At the end of the course, the student will be able to:

<b>25EE652.CO1</b>	Discuss causes of energy scarcity and its solution, energy resources and availability of renewable energy
<b>25EE652.CO2</b>	Outline energy from sun, energy reaching the Earth's surface and solar thermal energy applications
<b>25EE652.CO3</b>	Discuss types of solar collectors, their configurations, solar cell system, its characteristics, and their applications
<b>25EE652.CO4</b>	Explain generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse.
<b>25EE652.CO5</b>	Discuss production of energy from biomass, biogas.
<b>25EE652.CO6</b>	Summarize tidal energy resources, sea wave energy and ocean thermal energy.

## LESSON PLAN

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
<b>1.</b>	30/4/24	1	Introduction: Causes of Energy Scarcity, Solution to Energy Scarcity,	30/4/24	1	Textbook 1	Blackboard
<b>2.</b>	2/5/24	5	Factors Affecting Energy Resource Development, Energy Resources and Classification,	2/5/24	5	Textbook 1	Blackboard
<b>3.</b>	2/5/24	6	Renewable Energy – Worldwide Renewable Energy	2/5/24	6	Textbook 1	Blackboard
<b>4.</b>	14/5/24	1	Availability, Renewable Energy in India.	14/5/24	1	Textbook 1	Blackboard
<b>5.</b>	15/5/24	1	Energy from Sun: Sun- earth Geometric Relationship,	15/5/24	1	Textbook 1	Blackboard
<b>6.</b>	16/5/24	5	Layer of the Sun, Earth – Sun Angles and their Relationships,	16/5/24	5	Textbook 1	Blackboard
<b>7.</b>	16/5/24	6	Solar Energy Reaching the Earth's Surface, Solar Thermal Energy Applications.	16/5/24	6	Textbook 1	Blackboard
<b>8.</b>	21/5/24	1	Solar Thermal Energy Collectors: Types of Solar Collectors,	21/5/24	1	Textbook 1	
<b>9.</b>	22/5/24	1	Configurations of Certain Practical Solar Thermal	22/5/24	1	Textbook 1	Blackboard



			Collectors, Material Aspects of Solar Collectors,				
<b>10.</b>	23/5/24	5	Concentrating Collectors, Parabolic Dish – Stirling Engine System, Working of Stirling or Brayton Heat Engine,	23/5/24	5	Textbook 1	Blackboard
<b>11.</b>	23/5/24	6	Solar Collector Systems into Building Services, Solar Water Heating Systems, Passive Solar Water Heating Systems	23/5/24	6	Textbook 1	PPT
<b>12.</b>	28/5/24	1	Applications of Solar Water Heating Systems, Active Solar Space Cooling, Solar Air Heating, Solar Dryers,	28/5/24	1	Textbook 1	Blackboard
<b>13.</b>	29/5/24	1	Crop Drying, Space Cooling, Solar Cookers, Solar pond.	29/5/24	1	Textbook 1	PPT
<b>14.</b>	30/5/24	5	Solar Cells: Components of Solar Cell System, Elements of Silicon Solar Cell,	30/5/24	5	Textbook 1	PPT
<b>15.</b>	30/5/24	6	Cell materials, Practical Solar Cells, I – V Characteristics of Solar Cells,	30/5/24	6	Textbook 1	Blackboard
<b>16.</b>	4/6/24	1	Efficiency of Solar Cells,	4/6/24	1	Textbook 1	PPT
<b>17.</b>	5/6/24	1	Photovoltaic panels (series and parallel arrays)	5/6/24	1	Textbook 1	PPT
<b>18.</b>	6/6/24	5	Hydrogen Energy: Benefits of Hydrogen Energy, Hydrogen Production Technologies,	6/6/24	5	Textbook 1	PPT
<b>19.</b>	6/6/24	6	Hydrogen Energy Storage, Use of Hydrogen Energy,	6/6/24	6	Textbook 1	Blackboard
<b>20.</b>	11/6/24	1	Advantages and Disadvantages of Hydrogen Energy, Problems Associated with Hydrogen Energy.	11/6/24	1	Textbook 1	PPT
<b>21.</b>	12/6/24	1	Wind Energy: Windmills, Wind Turbines, Wind Resources, Wind Turbine Site Selection.	12/6/24	1	Textbook 1	PPT
<b>22.</b>	13/6/24	5	Geothermal Energy: Geothermal Systems, Classifications,	13/6/24	5	Textbook 1	PPT
<b>23.</b>	13/6/24	6	Geothermal Resource Utilization, Resource Exploration,	13/6/24	6	Textbook 1	Blackboard
<b>24.</b>	18/6/24	1	Geothermal Based Electric Power Generation	18/6/24	1	Textbook 1	PPT

25.	19/6/24	1	Associated Problems, environmental Effects.	19/6/24	1	Textbook 1	Blackboard
26.	20/6/24	5	Solid waste and Agricultural Refuse: Waste is Wealth, Key Issues,	20/6/24	5	Textbook 1	PPT
27.	20/6/24	6	Waste Recovery Management Scheme,	20/6/24	6	Textbook 1	Blackboard
28.	25/6/24	1	Advantages and Disadvantages of Waste Recycling, Sources and Types of Waste, Recycling of Plastics.	25/6/24	1	Textbook 1	Blackboard
29.	26/6/24	1	Module-4- Biomass Energy: Biomass Production, Energy Plantation	26/6/24	1	Textbook 1	Blackboard
30.	27/6/24	5	Biomass Gasification, Theory of Gasification,	27/6/24	5	Textbook 1	Blackboard
31.	27/6/24	6	Gasifier and Their Classifications, Chemistry of Reaction Process in Gasification	27/6/24	6	Textbook 1	Blackboard
32.	2/7/24	1	Updraft, Downdraft and Cross-draft Gasifiers,	2/7/24	1	Textbook 1	Blackboard
33.	3/7/24	1	Fluidized Bed Gasification, Use of Biomass Gasifier, Gasifier Biomass Feed Characteristics,	3/7/24	1	Textbook 1	Blackboard
34.	4/7/24	5	Applications of Biomass Gasifier, Cooling and Cleaning of Gasifiers.	4/7/24	5	Textbook 1	Blackboard
35.	4/7/24	6	Biogas Energy: Introduction, Biogas and its Composition,	4/7/24	6	Textbook 1	Blackboard
36.	9/7/24	1	Anaerobic Digestion, Biogas Production, Benefits of Biogas	9/7/24	1	Textbook 1	Blackboard
37.	10/7/24	1	Factors Affecting the Selection of a Particular Model of a Biogas Plant	10/7/24	1	Textbook 1	Blackboard
38.	11/7/24	5	Biogas Plant Feeds and their Characteristics.	11/7/24	5	Textbook 1	PPT
39.	11/7/24	6	Tidal Energy: Introduction, Tidal Energy Resource	11/7/24	6	Textbook 1	PPT
40.	13/7/24	2	Tidal Energy Availability, Tidal Power Generation in India,	13/7/24	2	Textbook 1	PPT
41.	13/7/24	3	Leading Country in Tidal Power Plant Installation,	13/7/24	3	Textbook 1	PPT
42.	16/7/24	1	Energy Availability in Tides, Tidal Power Basin, Turbines for Tidal Power.	16/7/24	1	Textbook 1	Blackboard

43.	18/7/24	5	Advantages and Disadvantages of Tidal Power, Problems Faced in Exploiting Tidal Energy	18/7/24	5	Textbook 1	PPT
44.	18/7/24	6	Module-5- Sea Wave Energy: Introduction, Motion in the sea Waves,	18/7/24	6	Textbook 1	PPT
45.	19/7/24	5	Power Associated with Sea Waves, Wave Energy Availability,	19/7/24	5	Textbook 1	PPT
46.	23/7/24	1	Devices for Harnessing Wave Energy, Advantages and Disadvantages of Wave Power.	23/7/24	1	Textbook 1	Blackboard
47.	24/7/24	1	Ocean Thermal Energy: Introduction, Principles of Ocean Thermal Energy Conversion (OTEC),	24/7/24	1	Textbook 1	PPT
48.	25/7/24	5	Ocean Thermal Energy Conversion plants,	25/7/24	5	Textbook 1	Blackboard
49.	25/7/24	6	Basic Rankine Cycle and its Working, Closed Cycle, Open Cycle and Hybrid Cycle,	25/7/24	6	Textbook 1	PPT
50.	26/7/24	5	Carnot Cycle, Application of OTEC in Addition to Produce Electricity,	26/7/24	5	Textbook 1	Blackboard
51.	26/7/24	7	Advantages, Disadvantages and Benefits of OTEC.	26/7/24	7	Textbook 1	Blackboard
52.	27/7/24	2	Revision module-1	27/7/24	2	Textbook 1	Blackboard
53.	29/7/24	1	Revision module-2	29/7/24	1	Textbook 1	Blackboard
54.	29/7/24	3	Revision module-3	29/7/24	3	Textbook 1	Blackboard
55.	29/7/24	5	Revision module-4	29/7/24	5	Textbook 1	Blackboard
56.	30/7/24	1	Revision module-5	30/7/24	1	Textbook 1	Blackboard
57.	30/7/24	4	Previous year question paper discussion	30/7/24	4	Textbook 1	Blackboard
58.	31/7/24	1	Previous year question paper discussion	31/7/24	1	Textbook 1	Blackboard
59.	31/7/24	5	Previous year question paper discussion	31/7/24	5	Textbook 1	Blackboard
60.	31/7/24	6	Previous year question paper discussion	31/7/24	6	Textbook 1	Blackboard

SL NO	NAME	DATES
1	CIE-1	1/6/24 – 3/6/24
2	CIE-2	3/7/24 -5/7/24
3	CIE-2	25/7/24-27/7/24

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list	15/5/2024
2	CCE-2 from the above list	5/6/2024

### Textbooks:

1. Nonconventional Energy Resources, Shobh Nath Singh, Pearson, 1st Edition, 2015.

### Reference Book;-

1. Nonconventional Energy Resources, B.H. Khan, McGraw Hill, 3rd Edition.
2. Renewable Energy; Power for a sustainable Future, Godfrey Boyle, Oxford, 3rd Edition, 2012.
3. Renewable Energy Sources: Their Impact on global Warming and Pollution, Tasneem Abbasi S.A. Abbasi, PHI,1st Edition, 2011.

Shobh Nath Singh

HEAD OF THE DEPARTMENT  
DEPARTMENT OF AIML  
OF ENGINEERING  
Bengaluru-560068





# THE OXFORD COLLEGE OF ENGINEERING

Hosur Road, Bommanahalli, Bengaluru-560 068

(Approved by AICTE, New Delhi, Accredited by NAAC, New Delhi & Affiliated to VTU, Belgaum)

## DEPARTMENT OF MECHATRONICS ENGINEERING

**Academic year: 2023-24 (EVEN)**

### **Department Academic Calendar**

S.No	Month	Days						No of Working Days	Activities
		Mon	Tue	Wed	Thu	Fri	Sat		
1	April/May	27 (FWD)	30	1(H)	2	3	4(H)	4	27th – FWD for 4 <sup>th</sup> Sem 27 <sup>th</sup> -DAC even
2	MAY	6	7	8	9	10	11	5	10 <sup>th</sup> Basava jayanthi 6 <sup>th</sup> to 16 <sup>th</sup> May- Value added course
3	MAY	12	13	14	15	16	17(H)	5	
4	MAY	20	21	22	23	24	25	6	22 <sup>nd</sup> may One day Workshop
5	MAY/JUNE	27	28	29	30	31	1(H)	5	28 <sup>th</sup> may industrial visit.
6	JUNE	3(CIE 1)	4 (CIE1)	5 (CIE 1)	6	7	8(PTM)	6	3 <sup>rd</sup> to 5 <sup>th</sup> CIE1 8 <sup>th</sup> -PTM
7	JUNE	10	11	12(H)	13	14	15(H)	5	13 <sup>th</sup> june one day workshop.
8	JUNE	17(H)	18	19	20	11(H)	12(H)	5	17 <sup>th</sup> -Bakrid
9	JUNE	24	25	26	27	28	29	6	
10	JULY	1	2	3(CIE 2)	4 (CIE2)	5 (CIE 2)	6(H)	5	3 <sup>rd</sup> to 5 <sup>th</sup> -CIE2
11	JULY	8	9	10	11	12	13	6	
12	JULY	15	16	17(H)	18	19	20(H)	4	17 <sup>th</sup> -Bakrid
13	JULY	22	23	24	25 (CIE 3)	26 (CIE 3)	27 (CIE 3)	6	25 <sup>th</sup> to 27 <sup>th</sup> -CIE-3
14	Nov	29	30	31(LWD)				3	31 <sup>st</sup> -last working day

HOD

Dr. B.K MANJUNATHA

Professor & Head

Department of Biotechnology

The Oxford College of Engineering

Bengaluru-560 068.



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

**THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Department of Civil Engineering**

**LESSON PLAN**

**Faculty Name:**Nayana B S

**Academic Year:**2023-24

**SUB.CODE&Name:** BCV401 & Analysis of Structures

**Year/Sem/Section:**2024/ IV

**COURSE OBJECTIVES**This course will enable the students to

CLO1. Understand the Different Forms of Structural Systems.

CLO2. Determine the Strain Energy and Slope and Deflection of Beams, Trusses and Frames.

CLO3. Analyse arches and cable structures.

CLO4. Analyse different types of beams and frames using slope deflection method.

CLO5. Analyse different types of beams and frames using moment distribution method.

**COURSE OUTCOMES:**

<b>CO1</b>	Identify the different forms of structural systems and analyse the trusses.
<b>CO2</b>	Evaluate the slope and deflections in beams, frames and trusses by using moment area method and energy principle.
<b>CO3</b>	Analyse and determine the stress resultants in arches and cables.
<b>CO4</b>	Analyse the indeterminate structures and construct BMD AND SFD using slope deflection methods
<b>CO5</b>	Analyse the indeterminate structures and construct BMD AND SFD using Moment Distribution Method.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	23/04/24	2	<b>MODULE 1:</b> Introduction and Analysis of Plane Trusses	23/04/24	2	T1 & T2	Chalk and Board
2.	24/04/24	1	Structural forms, Conditions of equilibrium	24/04/24	1	T1 & T2	Chalk and Board
3.	24/04/24	5	Compatibility conditions, Degree of freedom	24/04/24	5	T1 & T2	Chalk and Board

4.	26/04/24	2	Linear and nonlinear analysis	26/04/24	2	T1 & T2	Chalk and Board
5.	30/04/24	2	Static and kinematic indeterminacies of structural systems	30/04/24	2	T1 & T2	Chalk and Board
6.	03/05/24	2	Types of trusses, Assumptions in analysis	03/05/24	2	T1 & T2	Chalk and Board
7.	07/05/24	2	Analysis of determinate trusses by method of joints	07/05/24	2	T1 & T2	Chalk and Board
8.	08/05/24	1	Analysis of determinate trusses by method of joints	08/05/24	1	T1 & T2	Chalk and Board
9.	08/05/24	5	Analysis of determinate trusses by method of section	08/05/24	5	T1 & T2	Chalk and Board
10	14/05/24	2	Analysis of determinate trusses by method of section	14/05/24	2	T1 & T2	Chalk and Board
11	15/05/24	1	<b>MODULE 2: DEFLECTION OF BEAMS: Moment area method</b>	15/05/24	1	T1 & T2	Chalk and Board
12	15/05/24	5	Derivation, Mohr's theorems, sign convention	15/05/24	5	T1 & T2	Chalk and Board
13	17/05/24	2	Application of moment area method to determinate prismatic beams	17/05/24	2	T1 & T2	Chalk and Board
14	21/05/24	2	beams of varying cross section	21/05/24	2	T1 & T2	Chalk and Board
15	22/05/24	1	Use of moment diagram by parts	22/05/24	1	T1 & T2	Chalk and Board
16	22/05/24	5	Strain Energy: Principle of virtual displacements, Principle of virtual forces	22/05/24	5	T1 & T2	Chalk and Board
17	24/05/24	2	Strain energy and complimentary energy, Strain energy due to axial force, bending, shear and torsion	24/05/24	2	T1 & T2	Chalk and Board
18	28/05/24	2	Castigliano's theorems, application of Castigliano's theorems	28/05/24	2	T1 & T2	Chalk and Board
19	29/05/24	1	calculate deflection of beams, trusses and frames	29/05/24	1	T1 & T2	Chalk and Board
20	29/05/24	5	calculate deflection of beams, trusses and frames	29/05/24	5	T1 & T2	Chalk and Board
21	31/05/24	2	<b>MODULE 3: Arches and Cables: Introduction</b>	31/05/24	2	T1 & T2	Chalk and Board
22	04/06/24	2	Three-hinged circular and parabolic arches with supports at the same levels	04/06/24	2	T1 & T2	Chalk and Board
23	05/06/24	1	Three-hinged circular and parabolic arches with supports at different levels	05/06/24	1	T1 & T2	Chalk and Board
24	05/06/24	5	Determination of normal thrust,	05/06/24	5	T1 & T2	Chalk and

			radial shear and bending moment				Board
25	07/06/24	2	Analysis of cables under point loads and UDL	07/06/24	2	T1 & T2	Chalk and Board
26	10/06/24		<b>CIE 1</b>				
27	11/06/24		<b>CIE 1</b>				
28	12/06/24		<b>CIE 1</b>				
29	14/06/24	2	Analysis of cables under point loads and UDL	14/06/24	2	T1 & T2	Chalk and Board
30	18/06/24	2	Length of cables with supports at the same and different levels	18/06/24	2	T1 & T2	Chalk and Board
31	19/06/24	1	Stiffening trusses for suspension cables.	19/06/24	1	T1 & T2	Chalk and Board
32	19/06/24	5	Problems	19/06/24	5	T1 & T2	Chalk and Board
33	21/06/24	2	Problems	21/06/24	2	T1 & T2	Chalk and Board
34	25/06/24	2	<b>MODULE 4: Slope Deflection Method: Introduction</b>	25/06/24	2	T1 & T2	Chalk and Board
35	26/06/24	1	sign convention, development of slope deflection equation	26/06/24	1	T1 & T2	Chalk and Board
36	26/06/24	5	Analysis of continuous beams	26/06/24	5	T1 & T2	Chalk and Board
37	28/06/24	2	Analysis of continuous beams	28/06/24	2	T1 & T2	Chalk and Board
38	02/07/24	2	Analysis of continuous beams including settlement of supports	02/07/24	2	T1 & T2	Chalk and Board
39	03/07/24	1	Analysis of continuous beams including settlement of supports	03/07/24	1	T1 & T2	Chalk and Board
40	03/07/24	5	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy up to 3	03/07/24	5	T1 & T2	Chalk and Board
41	05/07/24	2	Problems on beams	05/07/24	2	T1 & T2	Chalk and Board
42	09/07/24	2	Problems on beams	09/07/24	2	T1 & T2	Chalk and Board
43	10/07/24	1	Problems on beams	10/07/24	1	T1 & T2	Chalk and Board
44	10/07/24	5	<b>MODULE 5: Moment Distribution Method</b>	10/07/24	5	T1 & T2	Chalk and Board
45	12/07/24	2	Introduction, Definition of terms	12/07/24	2	T1 & T2	Chalk and Board
46	16/07/24	2	Development of method	16/07/24	2	T1 & T2	Chalk and Board
47	19/07/24	2	Analysis of continuous beams with support yielding	19/07/24	2	T1 & T2	Chalk and Board
48	23/07/24	2	Analysis of continuous beams with support yielding	23/07/24	2	T1 & T2	Chalk and Board
49	24/07/24	1	Analysis of continuous beams	24/07/24	1	T1 & T2	Chalk and



			with support yielding				Board
50	24/07/24	5	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy up to 3	24/07/24	5	T1 & T2	Chalk and Board
51	26/07/24	2	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy up to 3	26/07/24	2	T1 & T2	Chalk and Board
52	29/07/24		<b>CIE II</b>				
53	30/07/24		<b>CIE II</b>				
54	31/07/24		<b>CIE II</b>				
55	02/08/24	2	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy up to 3	02/08/24	2	T1 & T2	Chalk and Board
56	06/08/24	2	Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy up to 3	06/08/24	2	T1 & T2	Chalk and Board

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	14/06/24
2	Class presentation	19/07/24

### Text Books:


1. Reddy, C.S., Basic Structural Analysis, 3rd ed., Tata McGraw-Hill Education Pvt. Ltd., New Delhi, 2011.
2. Hibbeler, R.C., Structural Analysis, 9th edition., Pearson publications., New Delhi, 2012.
3. Thandavamoorthy, T.S., Structural Analysis, 6th edition., Oxford University press., New Delhi, 2015.

### Reference Book:

1. Charles Head Norris, John Benson Wilbur and SenolUtku., Elementary Structural Analysis, 4th edition., Tata McGraw-Hill Education Pvt. Ltd., New Delhi, 2003.
2. Hall, A. and Kabaila, A.P., Basic Concepts of Structural Analysis, Pitman Publishing, London, John Wiley & Sons, New York, 1977.

Nayana. B. S

**Faculty**

  
Head of the Department  
Department of Civil Engineering  
The Oxford College of Engineering  
Bangalore-560 068.

**HOD**

**Name of the Department: CIVIL ENGINEERING**

**LESSON PLAN**

**Faculty Name: HARSHITHA N**

**Academic Year: 2023-2024**

**SUB.CODE&Name: 21CV62&CONCRETE TECHNOLOGY**

**Year/Sem/Section:3<sup>RD</sup>/ 6<sup>TH</sup>**

**COURSE OBJECTIVES**This course will enable the students to

CLO 1.To recognize material characterization of ingredients of concrete and its influence on properties of concrete.

CLO 2. Proportion ingredients of Concrete to arrive at most desirable mechanical properties of Concrete.

CLO 3.Ascertain and measure engineering properties of concrete in fresh and hardened state which meet the requirement of real time structures.

CLO 4.Ascertain and measure engineering properties of concrete in hardened state which meet the requirement of real time structures.

CLO 5.Ascertain and measure engineering properties of concrete during durability state which meet the requirement of real time structures.

**COURSE OUTCOMES:**

<b>CO1</b>	Assess and infer various properties of cement, cementitious materials, Fine and coarse aggregate as per codal provision and specifications.
<b>CO2</b>	Design the concrete mix for the given materials as per IS:10262-2019 provisions.
<b>CO3</b>	Understand the manufacturing process and asses the quality of green.
<b>CO4</b>	Describe the properties of fresh and hardened concrete – Strength and Durability aspects.
<b>CO5</b>	Examine and Evaluate properties of Cement and Concrete.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Referen ce Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	02-05- 2024	5 <sup>TH</sup>	Cement, Chemical composition, Physical and chemical properties,	02-05- 2024	5 <sup>TH</sup>	(T1)	Chalk and board
2.	03-05- 2024	2 <sup>ND</sup>	Cement, Chemical composition, Physical and chemical properties,	03-05- 2024	2 <sup>ND</sup>	(T1)	Chalk and board

3.	03-05-2024	4 <sup>TH</sup>	Other Cementitious materials and composition -GGBS, Fly ash rice Husk ash, Silica fume,	03-05-2024	4 <sup>TH</sup>	(T1)	Chalk and board
4.	08-05-2024	4 <sup>TH</sup>	Other Cementitious materials and composition -GGBS, Fly ash rice Husk ash, Silica fume,	08-05-2024	4 <sup>TH</sup>	(T1)	Chalk and board
5.	09-05-2024	5 <sup>TH</sup>	Hydration of cement, Factors influencing and affecting Hydration of cement, Types of cement	09-05-2024	5 <sup>TH</sup>	(T1)	Chalk and board
6.	11-05-2024	2 <sup>ND</sup>	Hydration of cement, Factors influencing and affecting Hydration of cement, Types of cement	11-05-2024	2 <sup>ND</sup>	(T1)	Chalk and board
7.	15-05-2024	4 <sup>TH</sup>	Fine aggregate - grading, analysis, Specify gravity	15-05-2024	4 <sup>TH</sup>	(T1)	Chalk and board
8.	16-05-2024	5 <sup>TH</sup>	Bulking, moisture content, deleterious materials.	16-05-2024	5 <sup>TH</sup>	(T1)	Chalk and board
9.	17-05-2024	2 <sup>ND</sup>	Coarse aggregate – Importance of size, shape and texture. Grading of aggregates - Sieve analysis, specific gravity	17-05-2024	2 <sup>ND</sup>	(T1)	Chalk and board
10.	17-05-2024	4 <sup>TH</sup>	Flakiness and elongation index, crushing, impact and abrasion tests. Codal Provisions.	17-05-2024	4 <sup>TH</sup>	(T1)	Chalk and board
11.	22-05-2024	4 <sup>TH</sup>	Workability - Process of manufactures of concrete: Batching, Mixing	22-05-2024	4 <sup>TH</sup>	(T1)	Chalk and board
12.	23-05-2024	5 <sup>TH</sup>	Assessment of Workability of Concrete, Factors affecting workability	23-05-2024	5 <sup>TH</sup>	(T1)	Chalk and board
13.	24-05-2024	2 <sup>ND</sup>	Measurement of workability – slump test, flow test	24-05-2024	2 <sup>ND</sup>	(T1)	Chalk and board
14.	24-05-2024	4 <sup>TH</sup>	Compaction factor test and Vee-Bee Consistometer tests	24-05-2024	4 <sup>TH</sup>	(T1)	Chalk and board
15.	25-05-2024	4 <sup>TH</sup>	Segregation and bleeding	25-05-2024	4 <sup>TH</sup>	(T1)	Chalk and board
16.	29-02-2024	4 <sup>TH</sup>	Transporting, Placing, Compaction,	29-02-2024	4 <sup>TH</sup>	(T1)	Chalk and board
17.	30-05-2024	5 <sup>TH</sup>	Transporting, Placing, Compaction,	30-05-2024	5 <sup>TH</sup>	(T1)	Chalk and board
18.	31-05-2024	2 <sup>ND</sup>	Curing, need and Types of curing	31-05-2024	2 <sup>ND</sup>	(T1)	Chalk and board
19.	31-05-2024	4 <sup>TH</sup>	Curing, need and Types of curing	31-05-2024	4 <sup>TH</sup>	(T1)	Chalk and board
20.			CIE 1 (03-06-2024 - 05-06-2024)				
21.	06-06-2024	5 <sup>TH</sup>	accelerated curing.	06-06-2024	5 <sup>TH</sup>	(T1)	Chalk and board
22.	07-06-2024	2 <sup>ND</sup>	Classification, effect on fresh and hardened concrete.	07-06-2024	2 <sup>ND</sup>	(T1)	Chalk and board
23.	07-06-	4 <sup>TH</sup>	retention time, Dosage ant their	07-06-	4 <sup>TH</sup>	(T1)	Chalk and



	2024		effects.	2024			board
24.	12-06-2024	4 <sup>TH</sup>	Influence on properties of paste, mortar, and concrete Types of concrete (in brief).	12-06-2024	4 <sup>TH</sup>	(T1)	Chalk and board
25.	13-06-2024	5 <sup>TH</sup>	Influence on properties of paste, mortar, and concrete Types of concrete (in brief).	13-06-2024	5 <sup>TH</sup>	(T1)	Chalk and board
26.	14-06-2024	2 <sup>ND</sup>	Concept of Concrete Mix design, variables in proportioning, exposure conditions, Procedure of mix design as per IS 10262-2019,	14-06-2024	2 <sup>ND</sup>	(T1)	Chalk and board
27.	14-06-2024	4 <sup>TH</sup>	Concept of Concrete Mix design, variables in proportioning, exposure conditions, Procedure of mix design as per IS 10262-2019,	14-06-2024	4 <sup>TH</sup>	(T1)	Chalk and board
28.	19-06-2024	4 <sup>TH</sup>	Numerical examples of Mix Design. Highlights of Other methods of Mix Design as per other codes.	19-06-2024	4 <sup>TH</sup>	(T1)	Chalk and board
29.	20-06-2024	5 <sup>TH</sup>	Numerical examples of Mix Design. Highlights of Other methods of Mix Design as per other codes.	20-06-2024	5 <sup>TH</sup>	(T1)	Chalk and board
30.	21-06-2024	2 <sup>ND</sup>	Numerical examples of Mix Design. Highlights of Other methods of Mix Design as per other codes.	21-06-2024	2 <sup>ND</sup>	(T1)	Chalk and board
31.	21-06-2024	4 <sup>TH</sup>	Numerical examples of Mix Design. Highlights of Other methods of Mix Design as per other codes.	21-06-2024	4 <sup>TH</sup>	(T1)	Chalk and board
32.	22-06-2024	2 <sup>ND</sup>	Factors affecting strength, w/c ratio, gel/space ratio, maturity concept,	22-06-2024	2 <sup>ND</sup>	(T1)	Chalk and board
33.	26-06-2024	3 <sup>RD</sup>	Effect of aggregate properties, assessment of compressive strength, flexural strength, tensile strength,	26-06-2024	3 <sup>RD</sup>	(T1)	Chalk and board
34.	27-06-2024	4 <sup>TH</sup>	Effect of aggregate properties, assessment of compressive strength, flexural strength, tensile strength,	27-06-2024	4 <sup>TH</sup>	(T1)	Chalk and board
35.	28-06-2024	5 <sup>TH</sup>	bond strength and modulus of elasticity, aggregate - cement bond strength.	28-06-2024	5 <sup>TH</sup>	(T1)	Chalk and board
36.	28-06-2024	2 <sup>ND</sup>	bond strength and modulus of elasticity.	28-06-2024	2 <sup>ND</sup>	(T1)	Chalk and board
37.	29-06-2024	4 <sup>TH</sup>	aggregate - cement bond strength.	29-06-2024	4 <sup>TH</sup>	(T1)	Chalk and board
38.			CIE 2 (03-07-2024 - 05-07-2024)				
39.	10-07-2024	4 <sup>TH</sup>	factors influencing strength and codal provisions	10-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board
40.	11-07-2024	5 <sup>TH</sup>	Relation between modulus of elasticity and strength,	11-07-2024	5 <sup>TH</sup>	(T1)	Chalk and board
41.	12-07-2024	2 <sup>ND</sup>	Relation between modulus of elasticity and strength,	12-07-2024	2 <sup>ND</sup>	(T1)	Chalk and board

42.	12-07-2024	4 <sup>TH</sup>	factors affecting modulus of elasticity, Poisson Ratio	12-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board
43.	13-07-2024	4 <sup>TH</sup>	Durability - definition, significance, short term and long-term durability	13-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board
44.	17-07-2024	4 <sup>TH</sup>	Shrinkage - plastic shrinkage and drying shrinkage,	17-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board
45.	19-07-2024	2 <sup>ND</sup>	Shrinkage - plastic shrinkage and drying shrinkage,	19-07-2024	2 <sup>ND</sup>	(T1)	Chalk and board
46.	19-07-2024	4 <sup>TH</sup>	Factors contributing to cracks in concrete - plastic shrinkage, settlement cracks,	19-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board
47.	24-07-2024	4 <sup>TH</sup>	Factors affecting shrinkage, Effect of creep	24-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board
48.			CIE 3 (25-07-2024 - 27-07-2024)				
49.	29-07-2024	4 <sup>TH</sup>	Measurement of creep, factors influencing creep	29-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board
50.	30-07-2024	5 <sup>TH</sup>	Permeability, Sulphate attack, Chloride attack, carbonation, freezing and thawing	30-07-2024	5 <sup>TH</sup>	(T1)	Chalk and board
51.	30-07-2024	2 <sup>ND</sup>	Permeability, Sulphate attack, Chloride attack, carbonation, freezing and thawing	30-07-2024	2 <sup>ND</sup>	(T1)	Chalk and board
52.	31-07-2024	4 <sup>TH</sup>	Construction joints and Expansion joints, Thermal effect of concrete. Codal Provisions.	31-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board
53.	31-07-2024	4 <sup>TH</sup>	Construction joints and Expansion joints, Thermal effect of concrete. Codal Provisions.	31-07-2024	4 <sup>TH</sup>	(T1)	Chalk and board

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list	03-06-2024
2	CCE-2 from the above list	15-07-2024

**Text Books:**

- 1.M.S.Shetty , "Concrete Technology" - Theory and Practice, , S.Chand and Company, New Delhi, 2002. (T1)
- 2.Concrete Technology (Trade, Technology & Industry), George White, Delmar Pu (T2)

**Reference Book:**

- 1.Advanced Concrete Technology, Zongjin Li, Wiley; 1 edition.
- 2.GambhirDhanpatRai&Sons , "Concrete Manual" -, New Delhi.
- 3.N.KrishnaRaju, "Concrete Mix Design" -, Sehgal - publishers .
- 4.IS:10262-2016 , "Recommended guidelines for concrete mix design", Bureau of Indian Standards, New Delhi.



**Faculty**



Head of the Department  
Department of Civil Engineering  
The Oxford College of Engineering  
Bangalore-560 068.

**HOD**

**Name of the Department: CIVIL ENGINEERING**  
**LESSON PLAN**

**Faculty Name: PRAKASH N**

**Academic Year: 2023-2024**

**SUB.CODE&Name: 18CV824 / REHABILITATION AND RETROFITTING**

**Year/Sem/Section:4<sup>RD</sup>/ 8<sup>TH</sup>**

**COURSE OBJECTIVES**This course will enable the students to

CLO1. Investigate the cause of deterioration of concrete structures.

CLO2. Strategies different repair and rehabilitation of structures.

CLO3. Evaluate the performance of the materials for repair.

**COURSE OUTCOMES:**

<b>CO1</b>	Assess and infer various properties of cement, cementitious materials, Fine and coarse aggregate as per codal provision and specifications.
<b>CO2</b>	Design the concrete mix for the given materials as per IS:10262-2019 provisions.
<b>CO3</b>	Understand the manufacturing process and asses the quality of green.
<b>CO4</b>	Describe the properties of fresh and hardened concrete – Strength and Durability aspects.
<b>CO5</b>	Examine and Evaluate properties of Cement and Concrete.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Referen ce Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	16-02-24	1ST & 2ND	Introduction and Definition for Repair	16-02-24	1ST & 2ND	(T1)	Chalk and board
2.	16-02-24	1ST & 2ND	Retrofitting, Strengthening and rehabilitation	16-02-24	1ST & 2ND	(T1)	Chalk and board
3.	23-02-24	1ST & 2ND	Physical and Chemical Causes of deterioration of concrete structures	23-02-24	1ST & 2ND	(T1)	Chalk and board
4.	23-02-24	1ST & 2ND	Physical and Chemical Causes of deterioration of concrete structures	23-02-24	1ST & 2ND	(T1)	Chalk and board
5.	24-02-24	1ST & 2ND	Evaluation of structural damages to the concrete structural elements due to earthquake.	24-02-24	1ST & 2ND	(T1)	Chalk and board



6.	24-02-24	1ST & 2ND	Evaluation of structural damages to the concrete structural elements due to earthquake.	24-02-24	1ST & 2ND	(T1)	Chalk and board
7.	01-03-24	1ST & 2ND	Purpose of assessment	01-03-24	1ST & 2ND	(T1)	Chalk and board
8.	01-03-24	1ST & 2ND	Rapid assessment, Investigation of damage	01-03-24	1ST & 2ND	(T1)	Chalk and board
9.	09-03-24	1ST & 2ND	Evaluation of surface and structural cracks	09-03-24	1ST & 2ND	(T1)	Chalk and board
10.	09-03-24	1ST & 2ND	Damage assessment procedure, destructive, non-destructive	09-03-24	1ST & 2ND	(T1)	Chalk and board
11.	22-03-24	1ST & 2ND	Semi destructive testing systems.	22-03-24	1ST & 2ND	(T1)	Chalk and board
12.	22-03-24	1ST & 2ND	Effects due to climate, temperature, chemicals, wear and erosion	22-03-24	1ST & 2ND	(T1)	Chalk and board
13.	23-03-24	1ST & 2ND	Design and construction errors, corrosion mechanism	23-03-24	1ST & 2ND	(T1)	Chalk and board
14.	23-03-24	1ST & 2ND	Effects of cover thickness and cracking, methods of corrosion protection	23-03-24	1ST & 2ND	(T1)	Chalk and board
15.	30-03-24	1ST & 2ND	Corrosion inhibitors, corrosion resistant steels	30-03-24	1ST & 2ND	(T1)	Chalk and board
16.	30-03-24	1ST & 2ND	Coatings, and cathodic protection.	30-03-24	1ST & 2ND	(T1)	Chalk and board
17.	05-04-24	1ST & 2ND	Maintenance and Retrofitting Techniques: Definitions: Maintenance	05-04-24	1ST & 2ND	(T1)	Chalk and board
18.	05-04-24	1ST & 2ND	Facts of Maintenance and importance of Maintenance Need for retrofitting	05-04-24	1ST & 2ND	(T1)	Chalk and board
19.	06-04-24	1ST & 2ND	Retrofitting of structural members i.e., column and beams by Jacketing technique, Externally bonding(ERB) technique	06-04-24	1ST & 2ND	(T1)	Chalk and board
20.	06-04-24	1ST & 2ND	Near surface mounted (NSM) technique	06-04-24	1ST & 2ND		
21.	12-04-24	1ST & 2ND	External post tensioning	12-04-24	1ST & 2ND	(T1)	Chalk and board
22.	12-04-24	1ST & 2ND	Section enlargement and guidelines for seismic rehabilitation of existing building.	12-04-24	1ST & 2ND	(T1)	Chalk and board
23.	19-04-24	1ST & 2ND	Materials for Repair and Retrofitting: Artificial fiber reinforced polymer like CFRP, GFRP, AFRP and natural fiber like Sisal and Jute	19-04-24	1ST & 2ND	(T1)	Chalk and board
24.	19-04-24	1ST & 2ND	Adhesive like, Epoxy Resin, Special concretes and mortars, concrete chemicals, special elements for accelerated strength gain, Techniques for Repair	19-04-24	1ST & 2ND	(T1)	Chalk and board
25.	26-04-24	1ST & 2ND	Rust eliminators and polymers coating for rebar during repair foamed concrete	26-04-24	1ST & 2ND	(T1)	Chalk and board

26.	03-05-24	1ST & 2ND	Mortar and dry pack, vacuum concrete, Guniting and Shot Crete Epoxy injection	03-05-24	1ST & 2ND	(T1)	Chalk and board
27.	03-05-24	1ST & 2ND	Mortar repair for cracks, shoring and underpinning	03-05-24	1ST & 2ND	(T1)	Chalk and board

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list	15-03-2024
2	CCE-2 from the above list	14-04-2024
3	CCE-2 from the above list	12-05-24

#### TEXT BOOKS:

1. Sidney, M. Johnson, "Deterioration, Maintenance and Repair of Structures"
2. Denison Campbell, Allen & Harold Roper, "Concrete Structures – Materials, Maintenance and Repair"-Longman Scientific and Technical.

#### REFERENCE BOOKS:

1. R.T.Allen and S.C. Edwards, "Repair of Concrete Structures"-Blakie and Sons
2. Raiker R.N., "Learning for failure from Deficiencies in Design, Construction and Service"- R&D Center(SDCPL).
- 3.CPWD Manual



**Faculty**



**Head of the Department**  
Department of Civil Engineering  
The Oxford College of Engineering  
Bangalore- 560 068.

**HOD**

IOAC



## CHILDREN'S EDUCATION SOCIETY (REGD.)

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

# THE OXFORD COLLEGE OF ENGINEERING

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))

Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551

E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

## LESSON PLAN

**Faculty Name** : Mr. Jayaraj N  
**Academic Year** : APRIL – AUG 2024  
**Subject code & Name** : BEC401 ELECTROMAGNETIC THEORY  
**Year/Sem/Section** : II year/IV SEM- B

### COURSE OBJECTIVES

CLO1 Study the different coordinate systems, Physical significance of Divergence, Curl and Gradient.

CLO2 Understand the applications of Coulomb's law and Gauss law to different charge distributions and the applications of Laplace's and Poisson's Equations to solve real time problems on capacitance of different charge distributions.

CLO3 Understand the physical significance of Biot-Savart's, Ampere's Law and Stokes' theorem for different current distributions

CLO4 Infer the effects of magnetic forces, materials and inductance

CLO5 Know the physical interpretation of Maxwell's equations and applications for Plane waves for their behavior in different media

CLO6 Acquire knowledge of Poynting theorem and its application of power flow

### COURSE OUTCOMES

CO1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.
CO2	Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem.
CO3	Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations
CO4	Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits.
CO5	Apply Maxwell's equations for time varying fields, EM waves in free space and conductors and Evaluate power associated with EM waves using Poynting theorem

S.No.	Planned		TOPICS TO BE COVERED	Execution		Text/ Reference Book	Pedagogy (As per the syllabus)
	Date	Hr		Date	Hr		
1.	22/04/24	1	Basics of Electromagnetics, Vector Analysis - Scalar field & Vector	22/04/24	1	William H	Black board,



			field – properties			Hayt Jr. and John A Buc	chalk and talk
2	23/04/24	4	Scalar and vector potential - properties, examples	23/04/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
3	24/04/24	2	Representation of a vector, unit vector, scaling, addition and subtraction	24/04/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
4	25/04/24	2	Dot product and cross product, scalar triple product, vector triple product, Numericals	25/04/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
5	27/04/24	1	Coordinate system - Rectangular, cartesian & cylindrical	27/04/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
6	29/04/24	1	Transformation of one type of coordinate to other, Numerical examples	29/04/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
7	30/04/24	4	Electrostatics - Coulomb's law, vector form, Principle of superposition	30/04/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
8	02/05/24	2	Numericals in coulomb's law	02/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
9	06/05/24	1	Electric Field intensity, Electric field intensity due to various charge distribution	06/05/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
10	07/05/24	4	Field due to continuous volume charge distribution	07/05/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
11	08/05/24	2	Field of a line charge	08/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
12	09/05/24	2	Electric Flux density	09/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
13	11/05/24	4	Numericals in electric field intensity	11/05/24	4	William H Hayt Jr. and	Black board,

						John A Buc	chalk and talk
14	13/05/24	1	Numericals in Electric flux density	13/05/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
15	14/05/24	4	Numericals in line charge	14/05/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
16	15/05/24	2	Numericals in volume charge distribution	15/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
17	16/05/24	2	Gauss law, Divergence, Maxwell's First equation, Vector operator and Divergence theorem	16/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
18	20/05/24	1	Energy expended in moving a point charge in an electric field	20/05/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
19	21/05/24	4	The line integral	21/05/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
20	22/05/24	2	Definition of potential difference and potential	22/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
21	23/05/24	2	The potential of a point charge and system of charges	23/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
22	25/05/24	2	Potential gradient, Energy density in an electrostatic field	25/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
23	27/05/24	1	Current and Current density, continuity of current	27/05/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
24	28/05/24	4	Metallic conductors	28/05/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
25	29/05/24	2	Conductor properties and boundary conditions	29/05/24	2	William H Hayt Jr. and	Black board,

						John A Buc	chalk and talk
26	30/05/24	2	Boundary conditions for perfect dielectrics	30/05/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
27	03/06/24	1	Capacitance and examples	03/06/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
28	04/06/24	4	Problems on continuity of current	04/06/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
29	05/06/24	2	Derivation of poisson's equation	05/06/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
30	06/06/24	2	Derivation of Laplace equation	06/06/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
31	08/06/24	2	Uniqueness theorem	08/06/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
32	13/06/24	2	Uniqueness theorem	13/06/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
33	18/06/24	4	Examples of the solutions of laplace and poisson's equation	18/06/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
34	19/06/24	2	Problems on laplace equation	19/06/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
35	20/06/24	2	Biot-Savart law	20/06/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
36	24/06/24	1	Numericals in Biot-Savart law	24/06/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
37	25/06/24	4	Ampere's Circuital law	25/06/24	4	William H Hayt Jr. and	Black board,

						John A Buc	chalk and talk
38	26/06/24	2	Numericals in ampere's Circuital law	26/06/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
39	27/06/24	2	Curl, Stoke's theorem	27/06/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
40	01/07/24	1	Numericals in Stokes's theorem	01/07/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
41	02/07/24	4	Magnetic flux and flux density, Scalar and Vector magnetic potentials	02/07/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
42	03/07/24	2	Numericals in magnetic flux and flux density	03/07/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
43	04/07/24	2	Numericals in scalar and vector magnetic potentials	04/07/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
44	08/07/24	1	Force on a moving charge and differential current element, Force between differential current elements	08/07/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
45	09/07/24	4	Force and torque on a closed circuit, Magnetization and permeability	09/07/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
46	10/07/24	2	Magnetic boundary conditions, Magnetic circuit	10/07/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
47	11/07/24	2	Inductance and Mutual inductance	11/07/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
48	13/07/24	1	Faraday's law, Displacement current	13/07/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
49	15/07/24	1	Maxwell's equation in point form, Maxwell's equation in integral form	15/07/24	1	William H Hayt Jr. and	Black board,



						John A Buc	chalk and talk
50	16/07/24	4	Retarded potentials	16/07/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
51	18/07/24	2	Numericals in Faraday's law and displacement current	18/07/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
52	22/07/24	1	Wave propagation in free space and dielectrics	22/07/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
53	23/07/24	4	Poynting's theorem and Wave power	23/07/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
54	24/07/24	2	Propagation in good conductors	24/07/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
55	25/07/24	2	Problems on poynting's theorem	25/07/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
56	27/07/24	4	Reflection of uniform plane waves at normal incidence	27/07/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk
57	01/08/24	2	Derivation and problems in reflection of plane waves at normal incidence	01/08/24	2	William H Hayt Jr. and John A Buc	Black board, chalk and talk
58	05/08/24	1	Standing Wave Ratio, Plane wave propagation in general direction	05/08/24	1	William H Hayt Jr. and John A Buc	Black board, chalk and talk
59	06/08/24	4	Skin effect or Depth of penetration,	06/08/24	4	William H Hayt Jr. and John A Buc	Black board, chalk and talk

### Continuous and Comprehensive evaluation

Sl. No.	CCE Component	Assignment Topics	Submission due on
1.	Assignment	Problems in coulomb's law, Electric Field intensity & Electric flux density	06/05/24

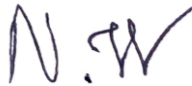
2.	Assignment	Uniqueness theorem, Numericals in Biot-savart law, stoke's theorem, Ampere's Circuital law	08/07/24
3.	Online quiz		16/07/24

**Text Books:**

T1: “**Engineering Electromagnetics**”, William H Hayt Jr. and John A Buck, Tata McGraw – Hill, 8<sup>th</sup> edition, Tata McGrawHill, 2014, ISBN-978-93-392-0327-6.

**Reference Books:**

1. Elements of Electromagnetics – Matthew N.O., Sadiku, Oxford university press, 4th Edn.
2. Electromagnetic Waves and Radiating systems – E. C. Jordan and K.G. Balman, PHI, 2nd Edn.
3. Electromagnetics- Joseph Edminister, Schaum Outline Series, McGraw Hill. N. NarayanaRao, —Fundamentals of Electromagnetics for Engineeringl, Pearson.



\_\_\_\_\_  
Faculty



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HOD



Children's Education Society ®  
THE OXFORD COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

(Approved by AICTE, New Delhi, Accredited by NAAC-A Grade & NBA, New Delhi & Affiliated to VTU, Belgaum)

## Lesson Plan

**Faculty Name:** IFFAT FATIMA

**Academic Year:** 2023-24 Even Sem

**SUB.CODE & Name:** TECHNOLOGICAL INNOVATION MANAGEMENT AND ENTREPRENEURSHIP( 21EC61)

**Year/Sem/Section:** 3rd Year/6B

**COURSE LEARNING OBJECTIVES:** This course will enable students to:

CLO1: Understand basic skills of Management

CLO2: Understand the need for Entrepreneurs and their skills

CLO3: Identify the Management functions and Social responsibilities.

CLO4: Understand the identification of Business, drafting the Business plan and sources of funding.

**COURSE OUTCOMES:** At the completion of the course the student will be able to:

CO1. Understand the fundamental concepts of Management and its functions.

CO2. Understand the different functions to be performed by managers/Entrepreneur.

CO3. Understand the social responsibilities of a Business.

CO4. Understand the Concepts of Entrepreneurship and to identify Business opportunities.

CO5. Understand the components in developing a business plan and awareness about various sources of funding and Institutions supporting Entrepreneur.

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
1.	Apr 30, 2024	3	<b>MODULE1:Management:</b> Nature and Functions of Management	Apr 30, 2024	3	TB1	Chalk and talk
2.	May 03, 2024	3	Importance, Definition, Management Functions, Levels of Management,	May 03, 2024	3	TB1	Chalk and talk
3.	May 06, 2024	1	Roles of Manager, Managerial Skills, Management & Administration,	May 06, 2024	1	TB1	Chalk and talk

4.	May 07, 2024	3	Management as a Science, Art & Profession	May 07, 2024	3	TB1	Chalk and talk
5.	May 08, 2024	1	Planning: Planning-Nature, Importance,	May 08, 2024	1	TB1	Chalk and talk
6.	May 13, 2024	3	Types, Steps and Limitations of Planning;	May 13, 2024	3	TB1:	Chalk and talk
7.	May 14, 2024	1	Decision Making – Meaning,,	May 14, 2024	1	TB1	Chalk and talk
8.	May 15, 2024	3	Types and Steps in Decision Making	May 15, 2024	3	TB1	Chalk and talk
9.	May 15, 2024	1	<b>MODULE2:Organizing and Staffing</b> Characteristics,	May 15, 2024	1	TB1	Chalk and talk
10.	May 17, 2024	3	Process of Organizing, Principles of Organizing Span of Management (meaning and importance)	May 17, 2024	3	TB1	Chalk and talk
11.	May 20, 2024	1	Departmentalization-Process Departmentalization, Purpose Departmentalization, Committees– Meaning, Types of Committees.	May 20, 2024	1	TB1	Chalk and talk
12.	May 21, 2024	3	Staffing-Need and Importance, Recruitment and Selection Process.	May 21, 2024	3	TB1	Chalk and talk
13.	May 22, 2024	1	Directing and Controlling:	May 22, 2024	1	TB1	Chalk and talk
14.	May 24, 2024	3	Meaning and Requirements of Effective Direction, Giving Orders; Motivation-Nature of Motivation, Motivation Theories	May 24, 2024	3	TB1	Chalk and talk
15.	May 27, 2024	1	(Maslow’s Need-Hierarchy Theory and Herzberg’s Two Factor Theory);	May 27, 2024	1	TB1	Chalk and talk
16.	May 28, 2024	3	Communication – Meaning, Importance and Purposes of Communication	May 28, 2024	3	TB1	Chalk and talk
17.	May 29, 2024	1	<b>MODULE3:Leadership</b> -Meaning, Characteristics, Behavioral Approach of Leadership; Coordination-Meaning, Types, Techniques of Coordination; Controlling	May 29, 2024	1	TB1	Chalk and talk
18.	May 30, 2024	3	Meaning, Need for Control System, Benefits of Control, Essentials of	May 30, 2024	3	TB1	Chalk and talk
19.	May 31, 2024	3	Effective Control System, Steps in Control Process	May 31, 2024	3	TB1	Chalk and talk
20.	Jun 07, 2024	1	Social Responsibilities of Business:	Jun 07, 2024	1	TB1	Chalk and talk



21.	Jun 10, 2024	3	Meaning of Social Responsibility, Social Responsibilities	Jun 10, 2024	3	TB1	Chalk and talk
22.	Jun 11, 2024	1	Responsibility, Social Responsibilities of Business towards Different Groups,	Jun 11, 2024	1	TB1	Chalk and talk
23.	Jun 12, 2024	3	Social Audit, Business Ethics and Corporate Governance	Jun 12, 2024	3	TB1	Chalk and talk
24.	Jun 14, 2024	3	<b>MODULE4:Entrepreneurship:</b> Introduction, Evolution of the concept of Entrepreneurship,	Jun 14, 2024	3	TB2	Chalk and talk
25.	Jun 18, 2024	1	Entrepreneurship, Entrepreneurship today, Types of Entrepreneurs, Intrapreneurship,	Jun 18, 2024	1	TB2	Chalk and talk
26.	Jun 19, 2024	3	Intrapreneurship, Entrepreneurial competencies, Capacity Building for Entrepreneurs.	Jun 19, 2024	3	TB2	Chalk and talk
27.	Jun 24, 2024	1	Introduction, Mobility of Entrepreneurs,	Jun 24, 2024	1	TB2	Chalk and talk
28.	Jun 25, 2024	3	Introduction, Mobility of Entrepreneurs,	Jun 25, 2024	3		Chalk and talk
29.	Jun 26, 2024	1	Business opportunities in India, Models for Opportunity Evaluation.	Jun 26, 2024	1	TB2	Chalk and talk
30.	Jun 27, 2024	3	<b>MODULE5:Business plans:</b> Introduction, purpose of a Business plan, contents of a Business plan, presenting a Business plan, why do some Business plan fail? Procedure for setting up an Enterprise.	Jun 27, 2024	3	TB2	Chalk and talk
31.	Jul 01, 2024	1	Institutions supporting Business opportunities: Central level institutions-	Jul 01, 2024	1	TB2	Chalk and talk
32.	Jul 02, 2024	3	National Board for micro, small & medium Enterprises(NBMSME),MSME-DO, National Small Industries Corporation. State level institutions- state	Jul 02, 2024	3	TB2	Chalk and talk
33.	Jul 08, 2024	1	state financial Corporations, State Industrial Development Corporation(SIDC),State Industrial Area Development Board (SIADB).	Jul 08, 2024	1	TB2	Chalk and talk
34.	Jul 09, 2024	3	Other Institutions - NABARD, Technical consultancy organization (TCO),	Jul 09, 2024	3	TB2	Chalk and talk
35.	Wed, Jul 10, 2024	1	Small Industries Development Bank of India(SIDBI),	Wed, Jul 10, 2024	1	TB2	Chalk and talk
36.	Jul 12, 2024	3	Non-governmental Organizations.	Jul 12, 2024	3	TB2	Chalk and talk


37.	Jul 15, 2024	1	Directorate Industries and commerce, District I	Jul 15, 2024	1	TB2	Chalk and talk
38.	Jul 16, 2024	3	Module 1 Revision	Jul 16, 2024	3	TB1 TB2	Chalk and talk
39.	Jul 18, 2024	3	Module 2 Revision	Jul 18, 2024	3	TB1 TB2	Chalk and talk
40.	Jul 22, 2024	1	Module 3 Revision	Jul 22, 2024	1	TB1 TB2	Chalk and talk
41.	Jul 23, 2024	3	Module 4 Revision	Jul 23, 2024	3	TB1 TB2	Chalk and talk
42.	Jul 24, 2024	1	Module 5 Revision	Jul 24, 2024	1	TB1 TB2	Chalk and talk
43.	Jul 29, 2024	1	Solving previous year question papers	Jul 29, 2024	1	TB1 TB2	Chalk and talk
44.	Jul 30, 2024	3	Solving previous year question papers	Jul 30, 2024	3	TB1 TB2	Chalk and talk

Assignment Topics
1. Assignment on technological innovation
2. Assignment on Management
3. Assignment on Entrepreneurship

Text Books:

1. Principles of Management – P.C Tripathi, P.N Reddy, McGraw Hill Education, 6th Edition, 2017. ISBN-13:978-93-5260-535-4.

2. Entrepreneurship Development Small Business Enterprises- Poornima M Charantimath, 2nd Edition, Pearson Education 2018, ISBN 978-81-317-6226-4.



Faculty



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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

# THE OXFORD COLLEGE OF ENGINEERING

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

## Department of Electrical & Electronics Engineering

### LESSON PLAN

**Faculty Name:**

**Academic Year:** 2023 – 2024 (EVEN)

**Sub Code & Name:** 18EE81 – Power Systems Operation & Control

**Year/Sem/Section:** 4<sup>th</sup> / 8<sup>th</sup> / EEE

#### **COURSE OBJECTIVES:**

- (1) To describe various levels of controls in power systems and the vulnerability of the system.
- (2) To explain components, architecture and configuration of SCADA.
- (3) To explain basic generator control loops, functions of Automatic generation control, speed governors and mathematical models of Automatic Load Frequency Control
- (4) To explain automatic generation control, voltage and reactive power control in an interconnected power system.
- (5) To explain reliability and contingency analysis, state estimation and related issues.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Describe various levels of controls in power systems, architecture and configuration of SCADA.
<b>CO2</b>	Develop and analyze mathematical models of Automatic Load Frequency Control.
<b>CO3</b>	Develop mathematical model of Automatic Generation Control in Interconnected Power system.
<b>CO4</b>	Discuss the Control of Voltage, Reactive Power and Voltage collapse.
<b>CO5</b>	Explain security, contingency analysis, and state estimation of power systems.

### **Continuous and Comprehensive Evaluation (CCE)**

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	16/02/24	2	Introduction: Operating States of Power System & Objectives of Control	16/02/24	2	T1 & R1	Chalk & Talk ,PPT
2.	16/02/24	4	SCADA - Basic Functions & advantages	16/02/24	4	T1 & R1	Chalk & Talk ,PPT

Faculty can choose any two of the following:

3.	17/02/24	2	Building Blocks of SCADA System	17/02/24	2	T1 & R1	Chalk & Talk ,PPT
4.	17/02/24	4	Components of RTU, Communication Sub Systems	17/02/24	4	T1 & R1	Chalk & Talk ,PPT
5.	23/02/24	2	Classification of SCADA Systems: Types of SCADA - With Block Diagram & Explanation	23/02/24	2	T1 & R1	Chalk & Talk ,PPT
6.	23/02/24	4	Revision of Module 1 & VTU Question Paper Discussion	23/02/24	4	T1 & R1	Chalk & Talk ,PPT
7.	24/02/24	2	Automatic Generation Control (AGC): Introduction, Explanation of ALFC & AVR Loops	24/02/24	2	T1 & R1	Chalk & Talk ,PPT
8.	24/02/24	4	Load Frequency Control - Explanation	24/02/24	4	T1 & R1	Chalk & Talk ,PPT
9.	01/03/24	2	Speed Governing System - Modelling	01/03/24	2	T1 & R1	Chalk & Talk ,PPT
10.	01/03/24	4	Turbine , Generator & Load Model	01/03/24	4	T1 & R1	Videos
11.	02/03/24	2	Completed Block Diagram Representation of Isolated Single Area ALFC Loop	02/03/24	2	T1 & R2	Chalk & Talk ,PPT
12.	02/03/24	4	Steady State Analysis of Single Area ALFC Loop	02/03/24	4	T1 & R2	Chalk & Talk ,PPT
13.	08/03/24	2	Dynamic State Analysis of Single Area ALFC Loop	08/03/24	2	T1 & R2	Chalk & Talk ,PPT
14.	08/03/24	4	Proportional & Integral Controller with Single Area ALFC	08/03/24	4	T1 & R2	Chalk & Talk ,PPT
15.	09/03/24	2	Problems in Single Area ALFC Designs	09/03/24	2	T1 & R2	Chalk & Talk ,PPT
16.	09/03/24	4	Revision of Module 2& VTU Question Paper Discussion	09/03/24	4	T1 & R2	Chalk & Talk ,PPT Videos
17.	15/03/24	2	Problems in Single Area ALFC Designs	15/03/24	2	T1 & R2	Group Learning
18.	15/03/24	4	Control of Voltage and Reactive Power : Introduction, Generation & Absorption of Reactive Power	15/03/24	4	T1 & R2	Chalk & Talk ,PPT
19.	16/03/24	2	Relationship Between Voltage , Power and Reactive Power at a node	16/03/24	2	T1 & R2	Chalk & Talk ,PPT
20.	16/03/24	4	Methods of Voltage Control	16/03/24	4	T1 & R2	Chalk & Talk ,PPT



21.	22/03/24	2	Methods of Voltage Control	22/03/24	2	T1 & R2	Chalk & Talk ,PPT
22.	22/03/24	4	Problems in Voltage Control	22/03/24	4	T1 & R2	Chalk & Talk ,PPT
23.	23/03/24	2	Voltage Collapse	23/03/24	2	T1 & R2	Group Discussion
24.	23/03/24	4	Automatic Generation Control (AGC) & Interconnected Power System : Introduction & Area Control Concept	23/03/24	4	T1 & R2	Chalk & Talk ,PPT
25.	29/03/24	2	Two area frequency control by State Variable method	29/03/24	2	T1 & R2	Chalk & Talk ,PPT
26.	29/03/24	4	Two area frequency control by State Variable method	29/03/24	4	T1 & R2	Chalk & Talk ,PPT
27.	30/03/24	2	Load Frequency Control With Generation rate Constraints	30/03/24	2	T1 & R2	Chalk & Talk ,PPT
28.	30/03/24	4	Speed Governor dead band and its effect on AGC	30/03/24	4	T1 & R2	Group Discussion
29.	05/04/24	2	Digital LF Controllers	05/04/24	2	T1 & R2	Chalk & Talk ,PPT
30.	05/04/24	4	Decentralized Control	05/04/24	4	T1 & R2	Chalk & Talk ,PPT
31.	06/04/24	2	Problems under Two area Frequency control	06/04/24	2	T1 & R2	Chalk & Talk ,PPT
32.	06/04/24	4	Revision of Module 3& VTU Question Paper Discussion	06/04/24	4	T1 & R2	Chalk & Talk ,PPT
33.	12/04/24	2	Power System Security: Introduction & Factors Affecting Security	12/04/24	2	T1 & R2	Chalk & Talk ,PPT
34.	12/04/24	4	Power System Security	12/04/24	4	T1 & R2	Chalk & Talk ,PPT
35.	13/04/24	2	Contingency Analysis - Introduction & Flowchart	13/04/24	2	T1 & R2	Chalk & Talk ,PPT
36.	13/04/24	4	Linear Sensitivity Factors	13/04/24	4	T1 & R2	Chalk & Talk ,PPT
37.	19/04/24	2	Ac Power Flow Methods	19/04/24	2	T1 & R2	Chalk & Talk ,PPT
38.	19/04/24	4	Contingency Selection and Ranking	19/04/24	4	T1 & R2	Chalk & Talk ,PPT
39.	20/04/24	2	State Estimation of Power Systems : Introduction	20/04/24	2	T1 & R2	Chalk & Talk ,PPT Videos
40.	20/04/24	4	Linear Least Square Estimation	20/04/24	4	T1 & R2	Chalk & Talk ,PPT

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list – Assignment	08/03/24
2	CCE-2 from the above list – Group discussion / Seminar / Case Studies	19/04/24

**Text Books:**

1. Power System Operation and Control, K. Uma Rao, Wiley, 1st Edition, 2012.
2. Modern Power System Analysis, D. P. Kothari, McGraw Hill, 4th Edition, 2011.
3. Power Generation Operation and Control, Allen J Wood et al, Wiley, 2nd Edition, 2003.
4. Electric Power Systems, B M Weedy, B J Cory, Wiley. 4th Edition, 2012.

**Reference Book:**

1. Computer-Aided Power System Analysis, G. L. Kusic, CRC Press, 2nd Edition.2010.
2. Power System SCADA and Smart Grid, Mini S Thom and John D. McDonald, CRC Press 2015.
3. Power System Stability and Control, Kundur, McGraw Hill, 8th Reprint, 2009.

*N. Chy*

**Faculty**

*Jc Deva*  
 Professor & Head EEE  
 The Oxford College of Engg  
 Bommanahalli, Hosur Road  
 Bangalore-560 068

**HOD**



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Department of Electrical & Electronics Engineering**

**LESSON PLAN**

**Faculty Name: M.Raichel Ruby**

**Academic Year: 2023 – 2024 (Even)**

**Sub Code & Name: 18EE821/ FACTS AND HVDC TRANSMISSION**

**Year/Sem/Section: 4<sup>th</sup>/8<sup>th</sup>**

**COURSE OBJECTIVES:** This course will enable the students to

- CLO1. To discuss transmission interconnections, flow of power in an ac system, limits of loading capability, dynamic stability considerations of a transmission interconnection and controllable parameters
- CLO2. To explain the basic concepts, definitions of flexible ac transmission systems and benefits from FACTS technology.
- CLO3. To describe shunt controllers, Static Var Compensator and static compensator for injecting reactive power in the transmission system in exchanging the controllability and power transfer capability.
- CLO4. To describe series controllers Thyristor Controlled Series Capacitor (TCSC) and the Static Synchronous Series Compensator (SSSC) for control of the transmission line current. To explain advantages of HVDC power transmission, overview and organization of HVDC system.
- CLO5. To describe the basics components of a converter, the methods for compensating the reactive power demanded by the converter.
- CLO6. Explain converter control for HVDC systems, commutation failure, and control functions.

**COURSE OUTCOMES:**

<b>CO1</b>	To discuss transmission interconnections, flow of Power in an AC System, limits of the loading capability, and dynamic stability considerations of a transmission interconnection and controllable parameters
<b>CO2</b>	To describe shunt controllers, Static Var Compensator and Static Compensator for injecting reactive power in the transmission system in enhancing the controllability and power transfer capability
<b>CO3</b>	To describe series Controllers Thyristor-Controlled Series Capacitor (TCSC) and the Static Synchronous Series Compensator (SSSC) for control of the transmission line current.
<b>CO4</b>	To explain advantages of HVDC power transmission, overview and organization of HVDC system

<b>CO5</b>	To describe the basic components of a converter, the methods for compensating the reactive power demanded by the converter.
<b>CO6</b>	Explain converter control for HVDC systems, commutation failure, and control functions

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	16/02/24	1	<b>FACTS Concept And General System</b> Considerations - Transmission Inter Connections	16/02/24	1	T1	Chalk & Talk
2.	16/02/24	3	Flow Of Power In Ac System	16/02/24	3	T1	Chalk &Talk
3.	17/02/24	2	Power Flow And Dynamic Stability of Transmission Inter Connection	17/02/24	2	T1	Chalk & Talk
4.	17/02/24	4	Importance of Controllable Parameters	17/02/24	4	T1	Chalk & Talk
5.	23/02/24	1	Types of FACTS Controllers	23/02/24	1	T1	Chalk & Talk
6.	23/02/24	3	Descriptions and Definitions of FACTS	23/02/24	3	T1	Chalk & Talk
7.	24/02/24	2	Benefits from FACTS Technology	24/02/24	2	T1	Chalk & Talk
8.	24/02/24	4	Perspective: HVDC (or) FACTS	24/02/24	4	T1	Chalk & Talk
9.	01/03/24	1	<b>Static Shunt Compensators</b> Objectives-Midpoint Voltage Regulation for Line Segmentation	01/03/24	1	T1	Chalk & Talk
10.	01/03/24	3	End of Line Voltage To Prevent Voltage Instability	01/03/24	3	T1	Chalk & Talk
11.	02/03/24	2	Improvement of Transient Stability	02/03/24	2	T1	Chalk & Talk
12.	02/03/24	4	Methods Of Controllable Var Generation: TCR (Thyristor Controlled Reactor)	02/03/24	4	T1	Chalk & Talk
13.	08/03/24	1	TSR (Thyristor Switched Reactor)	08/03/24	1	T1	Chalk & Talk
14.	08/03/24	3	TSC( Thyristor Switched Capacitor)	08/03/24	3	T1	Chalk & Talk
15.	09/03/24	2	Operation of single phase	09/03/24	2	T1	Chalk &



			TSC-TSR				Talk
16.	09/03/24	4	Converter Type Var Generators	09/03/24	4	T1	Chalk & Talk
17.	15/03/24	1	Operating principles	15/03/24	1	T1	Chalk & Talk
18.	15/03/24	3	Control approaches	15/03/24	3	T1	Chalk & Talk
19.	16/03/24	2	Static VAR compensators: SVC and STATCOM	16/03/24	2	T1	Chalk & Talk
20.	16/03/24	4	Regulation slope	16/03/24	4	T1	Chalk & Talk
21.	22/03/24	1	Compare STATCOM and SVC	22/03/24	1	T1	Chalk & Talk
22.	22/03/24	3	V-I and V-Q characteristics	22/03/24	3	T1	Chalk & Talk
23.	23/03/24	2	Transient stability & Response time	23/03/24	2	T1	Chalk & Talk
24.	23/03/24	4	<b>Static Series Compensators</b> Objectives of series compensation	23/03/24	4	T1	Chalk & Talk ,PPT
25.	29/03/24	1	Concept of series capacitive compensation	29/03/24	1	T1	Chalk & Talk
26.	29/03/24	3	Voltage stability and improvement of transient stability	29/03/24	3	T1	Chalk & Talk
27.	30/03/24	2	GTO Thyristor controlled series capacitor	30/03/24	2	T1	Chalk & Talk
28.	30/03/24	4	Thyristor-switched series capacitor	30/03/24	4	T1	Chalk & Talk ,PPT
29.	05/04/24	1	Thyristor controlled series capacitor	05/04/24	1	T1	Chalk & Talk ,PPT
30.	05/04/24	3	Static synchronous series compensator	05/04/24	3	T1	Chalk & Talk ,PPT
31.	06/04/24	2	Characteristics of Transmitted Power Versus Transmission Angle	06/04/24	2	T1	Chalk & Talk ,PPT
32.	06/04/24	4	<b>Development of HVDC Technology</b> : Introduction	06/04/24	4	T1	Chalk & Talk ,PPT
33.	12/04/24	1	Advantages of HVDC System	12/04/24	1	T1	Chalk & Talk ,PPT
34.	12/04/24	3	System Costs & Over view and organization of HVDC	12/04/24	3	T2	Chalk & Talk ,PPT
35.	13/04/24	2	Characteristics and Economic Aspects	13/04/24	2	T2	Chalk & Talk ,PPT
36.	13/04/24	4	Power Conversion: 3-phase converter	13/04/24	4	T1	Chalk & Talk ,PPT

37.	19/04/24	1	3-phase full bridge converter	19/04/24	1	T1	Chalk & Talk ,PPT
38.	19/04/24	3	12 pulse converter	19/04/24	3	T1	Chalk & Talk ,PPT
39.	20/04/24	2	<b>Control of HVDC Converter and System</b> Converter Control For an HVDC System	20/04/24	2	T1	Chalk & Talk ,PPT Videos
40.	20/04/24	4	Commutation Failure	20/04/24	4	T1	Chalk & Talk ,PPT
41.	26/04/24	1	HVDC Control and Design	26/04/24	1	T1	Chalk & Talk ,PPT
42.	26/04/24	3	HVDC Control Functions	26/04/24	3	R1	Chalk & Talk ,PPT
43.	03/05/24	2	Reactive Power	03/05/24	2	R1	Chalk & Talk ,PPT
44.	03/05/24	4	Voltage Stability	03/05/24	4	R1	Chalk & Talk ,PPT
45.	04/05/24	1	VTU QUE.PAPER DISCUSSION	05/02/24	1	R1	Chalk & Talk ,PPT
46.	04/05/24	3	VTU QUE.PAPER DISCUSSION	07/02/24	3	R1	Chalk & Talk ,PPT

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

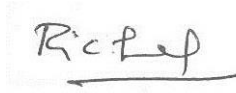
Sr. No.	CCE Component	Submission due Date
1	Assignment	08/03/24
2	Assignment	19/04/24
3	Assignment	03/05/24

Text Books:

1. UNDERSTANDING FACTS : Concepts and Technology of Flexible AC Transmission Systems by Narain G Hingorani, Laszlo Gyugyi Wiley 1<sup>st</sup> Edition 2000.
2. HVDC Transmission: power conversion Applications in power systems by Chan-Ki Kim et al Wiley 1<sup>st</sup> Edition 2009.

Reference Books:

1. Thyristor based FACTS controllers for electrical transmission systems by R.Mohan Mathur, Rajiv K.Varma Wiley 1<sup>st</sup> Edition 2002



**Faculty**



Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bangalore - 560 068

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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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**THE OXFORD COLLEGE OF ENGINEERING**

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Dr Nisha C Rani**

**Academic Year: 2023-24**

**SUB.CODE&Name: 21EE61/Management and Entrepreneurship**

**Year/Sem/Section: 3<sup>rd</sup> year/ 6<sup>th</sup> Sem**

**COURSE OBJECTIVES** This course will enable the students to

CLO 1. To introduce the field of management, task of the manager, importance of planning and types of planning, staff recruitment and selection process.

CLO 2. To discuss the ways in which work is allocation, structure of organizations, modes of communication and importance of managerial control in business.

CLO 3. To explain need of coordination between the manager and staff, the social responsibility of business and leadership.

CLO 4. To explain the role and importance of the entrepreneur in economic development and the concepts of entrepreneurship.

CLO 5. To explain various types of entrepreneurs and their functions, the myths of entrepreneurship and the factors required for capacity building for entrepreneurs.

CLO 6. To discuss the importance of Small Scale Industries and the related terms and problems involved.

CLO 7. To discuss methods for generating new business ideas and business opportunities in India and the importance of business plan.

CLO 8. To introduce the concepts of project management and discuss capital building process.

CLO 9. To explain project feasibility study and project appraisal and discuss project financing.

CLO 10. To discuss about different institutions at state and central levels supporting business enterprises

**COURSE OUTCOMES:**

<b>CO1</b>	<b>Explain the field of management, task of the manager, planning and steps in decision making.</b>
<b>CO2</b>	<b>Discuss the structure of organization, importance of staffing, leadership styles, modes of communication, and techniques of coordination and importance of managerial control in business.</b>
<b>CO3</b>	<b>Explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups</b>
<b>CO4</b>	<b>Show an understanding of role of SSI's in the development of country and state/central level institutions/ agencies supporting business enterprises.</b>
<b>CO5</b>	<b>Discuss the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques.</b>



SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/04/24	1	Management: Definition, Importance – Nature and Characteristics of Management	29/04/24	1	T1	Chalk & board
2.	30/04/24	4	Management Functions,	30/04/24	4	T1	ppt
3.	2/05/24	3	Roles of Manager	2/05/24	3	T1	ppt
4.	3/05/24	2	Levels of Management, Managerial Skills, Management & Administration	3/05/24	2	T1	ppt
5.	6/05/24	1	Management as a Science, Art & Profession	6/05/24	1	T1	ppt
6.	07/05/24	4	Planning: Nature, Importance and Purpose Of Planning	07/05/24	4	T1	ppt
7.	9/5/24	3	Types of Plans, Steps in Planning, Limitations of Planning	9/5/24	3	T1	Chalk & board
8.	11/5/24	1	Decision Making – Meaning, Types of Decision	11/5/24	1	T1	Chalk & board
9.	13/5/24	1	Steps in Decision Making.	13/5/24	1	T1	ppt
10.	14/5/24	4	Revision	14/5/24	4	T1	Chalk & board
11.	16/5/24	3	Organizing and Staffing: Meaning	16/5/24	3	T1	Chalk & board
12.	17/5/24	2	Nature and Characteristics of Organization – Process of	17/5/24	2	T1	Chalk & board
13.	14/5/24	1	Principles of Organization Departmentalization, Committees – meaning, Types of Committees,	14/5/24	1	T1	Chalk & board
14.	15/5/24	5	Centralization Versus Decentralization of Authority and Responsibility, Span of Control (Definition only)	15/5/24	5	T1	Chalk & board
15.	17/5/24	4	Nature and Importance of Staffing, Process of Selection and Recruitment.	17/5/24	4	T1	Chalk & board

16.	20/5/24	1	Directing and Controlling: Meaning and Nature of Directing	20/5/24	1	<b>T1</b>	Chalk & board
17.	21/5/24	4	Leadership Styles, Motivation Theories	21/5/24	4	<b>T1</b>	Chalk & board
18.	23/5/24	3	Communication – Meaning and Importance, Coordination- Meaning and Importance, Techniques of Coordination	23/5/24	3	<b>T1</b>	Chalk & board
19.	24/5/24	2	Controlling – Meaning, Steps in Controlling.	24/5/24	2	<b>T1</b>	Chalk & board
20.	25/5/24	4	Social Responsibilities of Business: Meaning of Social Responsibility, Social Responsibilities of Business towards Different Group	25/5/24	4	<b>T1</b>	Chalk & board
21.	27/5/24	1	Social Audit, Business Ethics and Corporate Governance.	27/5/24	1	<b>T1</b>	Chalk & board
22.	28/5/24	4	Entrepreneurship: Definition of Entrepreneur	28/5/24	4	<b>T1</b>	Chalk & board
23.	30/5/24	3	Importance of Entrepreneurship	30/5/24	3	<b>T1</b>	Chalk & board
24.	31/5/24	2	concepts of Entrepreneurship, Characteristics of successful Entrepreneur	31/5/24	2	<b>T1</b>	Chalk & board
25.	6/6/24	3	Classification of Entrepreneurs,	6/6/24	3	<b>T1</b>	Chalk & board
26.	7/6/24	2	Intrapreneur – An Emerging Class, Comparison between Entrepreneur and Intrapreneur	7/6/24	2	<b>T1</b>	Chalk & board
27.	10/6/24	1	Myths of Entrepreneurship, Entrepreneurial Development models	10/6/24	1	<b>T1</b>	Chalk & board
28.	11/6/24	4	Entrepreneurial development cycle, Problems faced by Entrepreneurs.	11/6/24	4	<b>T1</b>	Chalk & board
29.	13/6/24	3	Government policy and development of the Small Scale sector in India	13/6/24	3	<b>T2</b>	ppt

30.	14/6/24	2	Growth and Performance of Small Scale Industries in India, Sickness in SSI sector	14/6/24	2	<b>T2</b>	Ppt
31.	18/6/24	4	Problems for Small Scale Industries, Impact of Globalization on SSI	18/6/24	4	<b>T2</b>	ppt
32.	20/6/24	3	Impact of WTO/GATT on SSIs, Ancillary Industry and Tiny Industry (Definition only)	20/6/24	3	<b>T2</b>	ppt
33.	21/6/24	2	Institutional Support for Business Enterprises: Introduction,	21/6/24	2	<b>T2</b>	ppt
34.	22/6/24	3	Policies & Schemes of Central-Level Institutions	22/6/24	3	<b>T2</b>	ppt
35.	24/6/24	1	State-Level Institutions.	24/6/24	1	<b>T2</b>	ppt
36.	25/6/24	4	Growth and Performance of Small Scale Industries in India, Sickness in SSI sector	25/6/24	4	<b>T2</b>	ppt
37.	27/6/24	3	Problems for Small Scale Industries, Impact of Globalization on SSI	27/6/24	3	<b>T2</b>	ppt
38.	28/6/24	2	Revision.	28/6/24	2	<b>T2</b>	ppt
39.	1/7/24	1	Project Management: Meaning of Project, Project Objectives & Characteristics	1/7/24	1	<b>T2</b>	ppt
40.	2/7/24	4	Project Identification-Meaning & Importance	2/7/24	4	<b>T2</b>	ppt
41.	8/7/24	1	Project Life Cycle, Project Scheduling, Capital Budgeting	8/7/24	1	<b>T2</b>	ppt
42.	9/7/24	4	Generating an Investment Project Proposal	9/7/24	4	<b>T2</b>	ppt
43.	11/7/24	3	Project Report-Need and Significance of Report, Contents, Formulation, Project Analysis-Market Technical, Financial, Economic, Ecological,	11/7/24	3	<b>T2</b>	ppt
44.	12/7/24	2	Project Evaluation and Selection	12/7/24	2	<b>T2</b>	ppt
45.	13/7/24	2	Project Financing, Project Implementation Phase	13/7/24	2	<b>T2</b>	Ppt
46.	15/7/24	1	Human & Administrative aspects of Project Management,	15/7/24	1	<b>T2</b>	Ppt

			Prerequisites for Successful Project Implementation				
47.	16/7/24	4	New Control Techniques- PERT and CPM, Steps involved in developing the network, Uses and Limitations of PERT and CPM .	16/7/24	4	<b>T2</b>	Ppt
48.	18/7/24	3	Revision	18/7/24	3	<b>T2</b>	Ppt
49.	19/7/24	2	VTU Question Paper Discussion	19/7/24	2	<b>T2</b>	Ppt
50.	22/7/24	1	Revision	22/7/24	1	<b>T2</b>	Ppt
51.	23/7/24	4	VTU Question Paper Discussion	23/7/24	4	<b>T2</b>	Ppt
52.	29/7/24	1	VTU Question Paper Discussion	29/7/24	1	<b>T2</b>	Ppt
53.	30/7/24	4	VTU Question Paper Discussion	30/7/24	4	<b>T2</b>	Ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 Assignment	31/05/2024
2	CCE-2 Quiz	19/07/2024

**Text Books:**

1. Principles of Management, P.C.Tripathi, P.N.Reddy, McGraw Hill, 6th Edition, 2017.
2. Entrepreneurship Development And Small Business Enterprises, Poornima, M.Charanthimath, Pearson, 2<sup>nd</sup> Edition, 2014.

**Reference Book:**

1. Dynamics of Entrepreneurial Development and Management, Vasant Desai, Himalaya Publishing House, 2007.
2. Essentials of Management: An International, Innovation and Leadership Perspective, Harold Koontz, Heinz Weihrich, McGraw Hill, 10th Edition, 2016

*Nisha.C.Ram*

**Faculty**

*KC* *Devia*  
Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bangalore-560 068

**HOD**

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: SUMITHA T L**

**Academic Year: 2023-24 (EVEN)**

**Subject Code&Name: 21EE62 & Power System Analysis -2**

**Year/Sem/Section: 3<sup>rd</sup> year/6<sup>th</sup> semester**

**COURSE OBJECTIVES:**

This course will enable the students to

CLO1.To explain formulation of network models and bus admittance matrix for solving load flow problems.

CLO2. To discuss optimal operation of generators on a bus bar and optimum generation scheduling.

CLO3. To explain symmetrical fault analysis and algorithm for short circuit studies.

CLO4. To explain formulation of bus impedance matrix for the use in short circuit studies on power systems.

CLO5. To explain numerical solution of swing equation for multi-machine stability.

**COURSE OUTCOMES:**

<b>CO1</b>	Formulate network matrices and models for solving load flow problems
<b>CO2</b>	Perform steady state power flow analysis of power systems using numerical iterative techniques.
<b>CO3</b>	Solve issues of economic load dispatch and unit commitment problems.
<b>CO4</b>	Analyze short circuit faults in power system networks using bus impedance matrix.
<b>CO5</b>	Apply Point by Point method and Runge Kutta Method to solve Swing Equation.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text/Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29-04-24	4	<b>Network Topology:</b> Introduction	29-04-24	4	<b>T1</b>	Chalk & Talk, PPT
2.	30-04-24	2	Basic definitions of Elementary graph theory	30-04-24	2	<b>T1</b>	Chalk & Talk
3.	30-04-24	5	Tie-set, Cut-set, loop set matrices	30-04-24	5	<b>T1</b>	Chalk & Talk
4.	03-05-24	1	Formation of Tie-set, Cut-set, loop set matrices	03-05-24	1	<b>T1</b>	PPT
5.	06-05-24	4	Formation of Tie-set, Cut-set, loop set matrices	06-05-24	4	<b>T1</b>	PPT
6.	07-05-24	2	Primitive network- Impedance form and admittance form	07-05-24	2	<b>T1</b>	Chalk & Talk
7.	07-05-24	5	Formation of Incidence Matrices	07-05-24	5	<b>T1, T2</b>	Chalk & Talk
8.	08-05-24	3	Formation of Incidence Matrices	08-05-24	3	<b>T1, T2</b>	Chalk & Talk
9.	11-05-24	1	Y bus by Inspection Method-Derivation	11-05-24	1	<b>R1, R2</b>	Chalk & Talk
10.	13-05-24	4	Y bus by Inspection Method-Problems	13-05-24	4	<b>T1, T2</b>	PPT
11.	14-05-24	2	Y bus by Inspection Method-Problems	14-05-24	2	<b>T1, T2</b>	Chalk & Talk
12.	14-05-24	5	Y bus by Inspection Method-Problems	14-05-24	5	<b>T1, T2</b>	Chalk & Talk
13.	15-05-24	3	Formation of Ybus by Singular Transformation	15-05-24	3	<b>T1, T2</b>	Chalk & Talk
14.	17-05-24	1	Problems on YBUS by singular transformation-without mutual coupling	17-05-24	1	<b>T1</b>	Chalk & Talk
15.	20-05-24	4	Problems on YBUS by singular transformation-without mutual coupling	20-05-24	4	<b>T1</b>	Chalk & Talk
16.	21-05-24	2	Problems on YBUS by singular transformation-with mutual coupling	21-05-24	2	<b>T1</b>	Chalk & Talk
17.	21-05-24	5	Problems on YBUS by singular transformation-with mutual coupling	21-05-24	5	<b>T1, T2</b>	Chalk & Talk
18.	22-05-24	3	<b>Load Flow Studies:</b> Introduction	22-05-24	3	<b>T1, T2</b>	Chalk & Talk
19.	24-05-24	1	Classification of buses. Power flow equation	24-05-24	1	<b>T1, T2</b>	Chalk & Talk
20.	25-05-24	4	Operating Constraints, Data for Load flow	25-05-24	4	<b>T1, T2</b>	Chalk & Talk
21.	27-05-24	4	Gauss Seidal iterative method-Derivation	27-05-24	4	<b>T1, T2</b>	Chalk & Talk
22.	28-05-24	2	Gauss Seidal iterative method - Algorithm, Flowchart	28-05-24	2	<b>T1, T2</b>	Chalk & Talk

23.	28-05-24	5	Load flow Problem – with only PQ bus	28-05-24	5	<b>T1, T2</b>	Chalk & Talk
24.	29-05-24	3	Load flow Problem – with only PQ bus	29-05-24	3	<b>T1, T2</b>	Chalk & Talk
25.	31-05-24	1	Load flow problem – with PQ & PV bus	31-05-24	1	<b>T1, T2</b>	Chalk & Talk
26.	07-06-24	1	Load flow problem – with PQ & PV bus	07-06-24	1	<b>T1, R2</b>	Chalk & Talk
27.	08-06-24	2	Load flow problem – with limits	08-06-24	2	<b>T1, R2</b>	Chalk & Talk
28.	08-06-24	5	Load flow problem – with limits	08-06-24	5	<b>T1, R2</b>	Chalk & Talk
29.	10-06-24	4	<b>Load Flow Studies(continued):</b> Newton-Raphson method derivation in Polar form	10-06-24	4	<b>T1, R2</b>	Chalk & Talk
30.	11-06-24	2	Newton-Raphson method – Algorithm and Flowchart	11-06-24	2	<b>T1, T2</b>	Chalk & Talk
31.	11-06-24	5	Newton Raphson Method – Problems	11-06-24	5	<b>T1, T2</b>	Chalk & Talk
32.	12-06-24	3	Newton Raphson Method – Problems	12-06-24	3	<b>T1, T2</b>	Chalk & Talk
33.	14-06-24	1	Newton Raphson Method – Problems	14-06-24	1	<b>T1, T2</b>	Chalk & Talk
34.	18-06-24	2	Newton Raphson Method – Problems	18-06-24	2	<b>T1, T2</b>	Chalk & Talk
35.	18-06-24	5	Fast decoupled load flow method-Derivation	18-06-24	5	<b>T1, T2</b>	Chalk & Talk
36.	19-06-24	3	Fast decoupled load flow method-Algorithm, Flowchart	19-06-24	3	<b>T1, T2</b>	Chalk & Talk
37.	21-06-24	1	Fast Decoupled Method – Problems	21-06-24	1	<b>T1, T2</b>	Chalk & Talk
38.	22-06-24	3	Fast Decoupled Method – Problems	22-06-24	3	<b>T2</b>	PPT
39.	24-06-24	4	Fast Decoupled Method – Problems	24-06-24	4	<b>T2</b>	PPT
40.	25-06-24	2	Comparison of Load Flow Methods	25-06-24	2	<b>T2</b>	PPT
41.	25-06-24	5	<b>Economic operation of Power system:</b> Introduction and Performance curves	25-06-24	5	<b>T1, T2</b>	PPT
42.	26-06-24	3	Economic generation scheduling neglecting losses and generator limits	26-06-24	3	<b>T1, T2</b>	Chalk & Talk
43.	28-06-24	1	Problems on economic operation by neglecting losses	28-06-24	1	<b>T1, T2</b>	Chalk & Talk
44.	29-06-24	1	Problems on economic operation by neglecting losses	29-06-24	1	<b>T1, T2</b>	Chalk & Talk
45.	01-07-24	4	Economic generation scheduling including generator limits and neglecting losses	01-07-24	4	<b>T1, T2</b>	Chalk & Talk
46.	02-07-24	2	Economic generation scheduling with generator limits and neglecting losses -	02-07-24	2	<b>T1, T2</b>	Chalk & Talk

			Problems				
47.	02-07-24	5	Economic dispatch including transmission losses	02-07-24	5	T1, T2	Chalk & Talk
48.	08-07-24	4	Derivation of transmission loss formula	08-07-24	4	T1, T2	Chalk & Talk
49.	09-07-24	2	Problems based on transmission loss formula	09-07-24	2	T1, T2	Chalk & Talk
50.	09-07-24	5	Problems based on transmission loss formula	09-07-24	5	T1, T2	Chalk & Talk
51.	10-07-24	3	Problems based on transmission loss formula	10-07-24	3	T1, T2	Chalk & Talk
52.	12-07-24	1	<b>Unit Commitment:</b> Introduction, Constraints	12-07-24	1	T1, T2	PPT
53.	13-07-24	4	Unit commitment solution by prior list method - Flow chart and Algorithm	13-07-24	4	T1, T2	PPT
54.	15-07-24	4	Unit commitment solution dynamic forward DP approach - Flow chart and Algorithm	15-07-24	4	T1, T2	Chalk & Talk
55.	16-07-24	2	<b>Symmetrical Fault Analysis:</b> Z Bus Formulation by Step by step building algorithm	16-07-24	2	T1, T2	Chalk & Talk
56.	16-07-24	5	Z bus Algorithm for Short Circuit Studies	16-07-24	5	T1, T2	PPT
57.	19-07-24	3	Problems on Z bus formation	19-07-24	3	T1, T2	PPT
58.	22-07-24	3	Problems on Z bus formation	22-07-24	3	T1, T2	PPT
59.	23-07-24	2	Problems on Z bus formation	23-07-24	2	T1, T2	PPT
60.	23-07-24	5	<b>Power System Stability:</b> Numerical Solution of Swing Equation by Point by Point method	23-07-24	5	R1, R2	PPT
61.	24-07-24	3	Numerical Solution of Swing Equation by Runge Kutta Method	24-07-24	3	T1, T2	Chalk & Talk
62.	29-07-24	4	Problems on swing equation	29-07-24	4	T1, T2	Chalk & Talk
63.	30-07-24	2	Problems on swing equation	30-07-24	2	T1, T2	Chalk & Talk
64.	30-07-24	5	VTU QP Discussion	30-07-24	5	QP	Chalk & Talk
65.	31-07-24	3	VTU QP Discussion	31-07-24	3	QP	Chalk & Talk

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
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- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	07-06-24
2	Assignment	26-07-24

### Text Books:

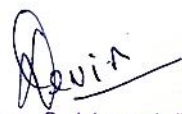
1. Modern Power System Analysis, D P Kothari, I J Nagrath, McGraw Hill, 4th Edition, 2011.
2. Computer Methods in Power Systems Analysis, Glenn W. Stagg, Ahmed H Ei - Abiad, ScientificInternational, Pvt. Ltd, 1st Edition, 2019.
3. Power Generation Operation and Control, Allen J Wood etal, Wiley, 2nd Edition, 2016.

### Reference Books:

1. Computer Techniques in Power System Analysis, M.A. Pai, McGraw Hill, 2nd Edition, 2012.
2. Power System Analysis, Hadi Saadat, McGraw Hill, 2nd Edition, 2002.



Faculty



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HOD





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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

**THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Department of Electrical & Electronics Engineering**

**LESSON PLAN**

**Faculty Name: M.Raichel Ruby**

**Academic Year: 2023 – 2024 (Even)**

**Sub Code & Name: 21EE63 & Signals and Digital Signal Processing**

**Year/Sem/Section: 3<sup>rd</sup>/6<sup>th</sup>**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To explain basic signals, their classification, basic operations on signals, and the properties of the systems.

CLO2. To explain the convolution of signals in continuous and discrete time domain and the properties of impulse response representation. .

CLO3. To explain the computation of Discrete Fourier Transform of a sequence by direct method, Linear transformation Method and using Fast Fourier Transformation Algorithms. .

CLO4. To explain design of IIR all pole analog filters and transform them into digital filter using Impulse Invariant and Bilinear transformation Techniques and to obtain their Realization.

CLO5. To explain design of FIR filters using Window Method and Frequency Sampling Method and to obtain their Realization

**COURSE OUTCOMES:**

<b>CO1</b>	Discuss classification and basic operations that can be performed on both continuous and discrete time signals.
<b>CO2</b>	Evaluate Discrete Fourier Transform of a sequence and the convolution of two sequences to determine the output sequence.
<b>CO3</b>	Evaluate Discrete Fourier Transform of a sequence by using fast methods.
<b>CO4</b>	Design Butterworth and Chebyshev IIR digital filters and FIR filters using different techniques.
<b>CO5</b>	Develop different structures for IIR and FIR filters

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/04/24	5	Definitions of signals & system	29/04/24	5	T1	Chalk & Talk
2.	30/04/24	3	Classification of signals	30/04/24	3	T1	Chalk &Talk
3.	02/05/24	1	Problems	02/05/24	1	T1	Chalk & Talk
4.	06/05/24	5	problems	06/05/24	5	T1	Chalk & Talk
5.	07/05/24	3	Basic operation on signals	07/05/24	3	T1	Chalk & Talk
6.	08/05/24	2	problems	08/05/24	2	T1	Chalk & Talk
7.	08/05/24	4	Problems	08/05/24	4	T1	Chalk & Talk
8.	09/05/24	1	Problems	09/05/24	1	T1	Chalk & Talk
9.	11/05/24	5	Elementary Signals	11/05/24	5	T1	Chalk & Talk
10.	13/05/24	5	Properties of system	13/05/24	5	T1	Chalk & Talk
11.	14/05/24	3	problems	14/05/24	3	T1	Chalk & Talk
12.	15/05/24	2	Convolution	15/05/24	2	T1	Chalk & Talk
13.	15/05/24	4	Convolution Sum for C.T	15/05/24	4	T1	Chalk & Talk
14.	16/05/24	1	Problems	16/05/24	1	T1	Chalk & Talk
15.	20/05/24	5	Problems	20/05/24	5	T1	Chalk & Talk
16.	21/05/24	3	Convolution Sum for D.T	21/05/24	3	T1	Chalk & Talk
17.	22/05/24	2	Problems	22/05/24	2	T1	Chalk & Talk
18.	22/05/24	4	Problems	22/05/24	4	T1	Chalk & Talk
19.	23/05/24	1	Convolution Integral for C.T	23/05/24	1	T1	Chalk & Talk
20.	25/05/24	3	Problems	25/05/24	3	T1	Chalk & Talk
21.	27/05/24	5	Problems	27/05/24	5	T1	Chalk &

							Talk
22.	28/05/24	3	Convolution Integral for D.T	28/05/24	3	T1	Chalk & Talk
23.	29/05/24	2	Problems	29/05/24	2	T1	Chalk & Talk
24.	29/05/24	4	Problems	29/05/24	4	T1	Chalk & Talk ,PPT
25.	30/05/24	1	Properties of impulse response representation.	30/05/24	1	T1	Chalk & Talk
26.	06/06/24	1	Problems	06/06/24	1	T1	Chalk & Talk
27.	08/06/24	2	Problems	08/06/24	2	T1	Chalk & Talk
28.	08/06/24	4	<b>MODULE -2</b> Introduction to DFT	08/06/24	4	T1	Chalk & Talk ,PPT
29.	10/06/24	5	Properties of DFT	10/06/24	5	T1	Chalk & Talk ,PPT
30.	11/06/24	3	Computing IDFT by matrix relation & problems	11/06/24	3	T1	Chalk & Talk ,PPT
31.	12/06/24	2	Problems	12/06/24	2	T1	Chalk & Talk ,PPT
32.	12/06/24	4	Properties of DFT:linearity, shifting property & Problems	12/06/24	4	T1	Chalk & Talk ,PPT
33.	13/06/24	1	Properties-symmerty & Problems	13/06/24	1	T1	Chalk & Talk ,PPT
34.	18/06/24	3	Circular convolution – proof& Problems	18/06/24	3	T3	Chalk & Talk ,PPT
35.	19/06/24	2	Circular arrays-problems	19/06/24	2	T3	Chalk & Talk ,PPT
36.	19/06/24	4	Stockhams method,Matrix method and problems	19/06/24	4	T1	Chalk & Talk ,PPT
37.	20/06/24	1	Introduction to Signal segmentation using overlap add method	20/06/24	1	T1	Chalk & Talk ,PPT
38.	22/06/24	1	Problems using overlap add method	22/06/24	1	T1	Chalk & Talk ,PPT
39.	24/06/24	5	Signal segmentation using overlap save method and problems	24/06/24	5	T1	Chalk & Talk ,PPT Videos
40.	25/06/24	3	Problems	25/06/24	3	T1	Chalk & Talk ,PPT

41.	26/06/24	2	<b>MODULE -3</b> Direct computation of DFT, need for efficient computation of the DFT (FFT algorithms).	26/06/24	2	T1	Chalk & Talk ,PPT
42.	26/06/24	4	DITFFT algorithms-first and second stage decimation	26/06/24	4	T2	Chalk & Talk ,PPT
43.	27/06/24	1	Problems on DIT FFT algorithms	27/06/24	1	T2	Chalk & Talk ,PPT
44.	29/06/24	5	Problems on DIT FFT algorithms	29/06/24	5	T2	Chalk & Talk ,PPT
45.	01/07/24	5	Problems on DIF FFT algorithms	01/07/24	5	T2	Chalk & Talk ,PPT
46.	02/07/24	3	Problems on DIFFFT algorithms	02/07/24	3	T2	Chalk & Talk ,PPT
47.	08/07/24	5	Introduction to Inverse FFT & problems on IDIF FFT algorithms	08/07/24	5	T2	Chalk & Talk ,PPT
48.	09/07/24	3	Problems on IDIT FFT algorithms	09/07/24	3	T2	Chalk & Talk ,PPT
49.	10/07/24	2	<b>MODULE-4</b> Introduction to butterworth & Design of butterworth filter (analog)	10/07/24	2	T1	Chalk & Talk ,PPT
50.	10/07/24	4	Design of chebyshev filter(analog)	10/07/24	4	T1	Chalk & Talk ,PPT
51.	11/07/24	1	Frequency transformation in digital domain using impulse invariant transformation and problems	11/07/24	1	T1	Chalk & Talk
52.	13/07/24	3	Frequency transformation in digital domain using Bilinear transformation and problems	13/07/24	3	T1	Chalk & Talk
53.	15/07/24	5	Design of IIR butterworth filter using impulse invariant transformation & problems	15/07/24	5	T1	Chalk & Talk
54.	16/07/24	3	Design of IIR butterworth filter using Bilinear transformation & problems	16/07/24	3	T1	Chalk & Talk
55.	18/07/24	1	Design of chebyshev filter type-I(analog) and problems	18/07/24	1	T1	Chalk & Talk
56.	22/07/24	5	Design of IIR chebyshev	22/07/24	5	T1	Chalk &

			filter using impulse invariant transformation & problems				Talk
57.	23/07/24	3	Design of FIR digital filters- introduction , Properties of FIR digital filters	23/07/24	3	T1	Chalk & Talk
58.	24/07/24	2	Windowing rectangular, modified rectangular	24/07/24	2	T1	Chalk & Talk
59.	24/07/24	4	Blackman ,hamming, Hanning and Kaiser windows	24/07/24	4	T1	Chalk & Talk
60.	29/07/24	5	FIR filter design using frequency sampling Technique	29/07/24	5	T1	Chalk & Talk
61.	30/07/24	3	Structures for Filters: IIR Filters - direct form I and direct form II	30/07/24	3	T1	Chalk & Talk
62.	31/07/24	2	cascade and parallel structures	31/07/24	2	T1	Chalk & Talk
63.	31/07/24	4	FIR filters-direct form	31/07/24	4	T1	Chalk & Talk

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list – Assignment	14/06/2024
2	CCE-2 from the above list – Online Quizzes	19/07/2024

### Text Books:

1. Introduction to Digital Signal Processing, Jhonny R. Jhonson, Pearson 1 st Edition, 2016.
2. Digital Signal Processing – Principles, Algorithms, and Applications, Jhon G. Proakis Dimitri G. Manolakis, Pearson, 4 th Edition, 2007.
3. Digital Signal Processing, A. Nagoor Kani, McGraw Hill, 2nd Edition, 2012.



4. Digital Signal Processing, Shaila D. Apte, Wiley, 2nd Edition, 2009.
5. Digital Signal Processing, Ashok Amberdar, Cengage, 1st Edition, 2007.
6. Digital Signal Processing, Tarun Kumar Rawat, Oxford, 1st Edition, 2015.

R. C. D. P.

**Faculty**

*Jc* *Devin*  
Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bangalore-560 088

**HOD**

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Administrative Office:

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### Department of Electrical & Electronics Engineering

### LESSON PLAN

**Faculty Name:**

**Academic Year:** 2023 – 2024 (Even)

**Sub Code & Name:** 21EE641 & Sensors & Transducers

**Year/Sem/Section:** 3<sup>rd</sup> /6<sup>th</sup> /EEE

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To discuss need of transducers, their classification, advantages and disadvantages.

CLO2. To discuss working of different types of transducers and sensors.

CLO3. To discuss recent trends in sensor technology and their selection.

CLO4. To discuss basics of signal conditioning and signal conditioning equipment.

CLO5. To discuss configuration of Data Acquisition System and data conversion. To discuss the basics of Data transmission and telemetry.

CLO6: To explain measurement of various non-electrical quantities.

### **COURSE OUTCOMES:**

<b>CO1</b>	Classify the transducers and explain the need of transducers, their classification, advantages and disadvantages. Explain the working of various transducers and sensors.
<b>CO2</b>	Outline the recent trends in sensor technology and their selection.
<b>CO3</b>	Analyze the signal conditioning and signal conditioning equipment. Illustrate different configuration of Data Acquisition System and data conversion.
<b>CO4</b>	Show knowledge of data transmission and telemetry.
<b>CO5</b>	Explain measurement of non-electrical quantities -temperature, flow, speed, force, torque, power and viscosity

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/04/24	2	Sensors and Transducers: Introduction	29/04/24	2	T1 & R1	Chalk & Talk ,PPT
2.	30/04/24	1	Classification of Transducers, Advantages	30/04/24	1	T1 & R1	Chalk & Talk ,PPT

			and Disadvantages of Electrical Transducers				
3.	02/05/24	2	Transducers Actuating Mechanisms	02/05/24	2	T1 & R1	Chalk & Talk ,PPT
4.	03/05/24	3	Resistance Transducers	03/05/24	3	T1 & R1	Chalk & Talk ,PPT
5.	06/05/24	2	Variable Inductance Transducers	06/05/24	2	T1 & R1	Chalk & Talk ,PPT
6.	07/05/24	1	Capacitive Transducers	07/05/24	1	T1 & R1	Chalk & Talk ,PPT
7.	09/05/24	2	Piezoelectric Transducers	09/05/24	2	T1 & R1	Chalk & Talk ,PPT
8.	11/05/24	3	Hall Effect Transducers	11/05/24	3	T1 & R1	Chalk & Talk ,PPT
9.	13/05/24	2	Thermoelectric Transducers	13/05/24	2	T1 & R1	Chalk & Talk ,PPT
10.	14/05/24	1	Photoelectric Transducers.	14/05/24	1	T1 & R1	Videos
11.	16/05/24	2	Sensors and Transducers: Strain Gages, Load Cells	16/05/24	2	T1 & R2	Chalk & Talk ,PPT
12.	17/05/24	3	Proximity Sensors, Pneumatic Sensors	17/05/24	3	T1 & R2	Chalk & Talk ,PPT
13.	20/05/24	2	Light Sensors, Tactile Sensors, Fiber Optic Transducers	20/05/24	2	T1 & R2	Chalk & Talk ,PPT
14.	21/05/24	1	Digital Transducers	21/05/24	1	T1 & R2	Chalk & Talk ,PPT
15.	23/05/24	2	Recent Trends – Smart Pressure Transmitters, Selection of Sensors	23/05/24	2	T1 & R2	Chalk & Talk ,PPT
16.	24/05/24	3	Rotary – Variable Differential Transformer	24/05/24	3	T1 & R2	Chalk & Talk ,PPT Videos
17.	25/05/24	2	Synchros and Resolvers	25/05/24	2	T1 & R2	Group Learning
18.	27/05/24	2	Induction Potentiometers	27/05/24	2	T1 & R2	Chalk & Talk ,PPT
19.	28/05/24	1	Micro Electromechanical Systems	28/05/24	1	T1 & R2	Chalk & Talk ,PPT
20.	30/05/24	2	Revision of Module 2	30/05/24	2	T1 & R2	Chalk & Talk ,PPT
21.	31/05/24	3	Signal Condition: Introduction, Functions of Signal Conditioning Equipment	31/05/24	3	T1 & R2	Chalk & Talk ,PPT
22.	06/06/24	2	Amplification, Types of Amplifiers	06/06/24	2	T1 & R2	Chalk & Talk ,PPT
23.	07/06/24	3	Mechanical Amplifiers Fluid Amplifiers	07/06/24	3	T1 & R2	Group Discussion
24.	08/06/24	1	Optical Amplifiers, Electrical and electronic	08/06/24	1	T1 & R2	Chalk & Talk ,PPT

			Amplifiers.				
25.	10/06/24	2	Data Acquisition Systems and Conversion: Introduction	10/06/24	2	T1 & R2	Chalk & Talk ,PPT
26.	11/06/24	1	Objectives and Configuration of Data Acquisition System	11/06/24	1	T1 & R2	Chalk & Talk ,PPT
27.	13/06/24	2	Data Acquisition Systems, Data Conversion	13/06/24	2	T1 & R2	Chalk & Talk ,PPT
28.	14/06/24	3	Module 3 Revision	14/06/24	3	T1 & R2	Group Discussion
29.	18/06/24	1	Data Transmission and Telemetry: Data/Signal Transmission	18/06/24	1	T1 & R2	Chalk & Talk ,PPT
30.	20/06/24	2	Data Transmission and Telemetry: Data/Signal Transmission	20/06/24	2	T1 & R2	Chalk & Talk ,PPT
31.	21/06/24	3	Telemetry.	21/06/24	3	T1 & R2	Chalk & Talk ,PPT
32.	24/06/24	2	Telemetry.	24/06/24	2	T1 & R2	Chalk & Talk ,PPT
33.	25/06/24	1	Measurement of Non – Electrical Quantities: Pressure Measurement	25/06/24	1	T1 & R2	Chalk & Talk ,PPT
34.	27/06/24	2	Measurement of Non – Electrical Quantities: Pressure Measurement	27/06/24	2	T1 & R2	Chalk & Talk ,PPT
35.	28/06/24	3	Revision of Module 3	28/06/24	3	T1 & R2	Chalk & Talk ,PPT
36.	29/06/24	2	Measurement of Non – Electrical Quantities (continued):Temperature Measurement	29/06/24	2	T1 & R2	Chalk & Talk ,PPT
37.	01/07/24	2	Flow Measurement – Introduction	01/07/24	2	T1 & R2	Chalk & Talk ,PPT
38.	02/07/24	1	Electromagnetic Flow meters	02/07/24	1	T1 & R2	Chalk & Talk ,PPT
39.	08/07/24	2	Ultrasonic Flow Meters	08/07/24	2	T1 & R2	Chalk & Talk ,PPT Videos
40.	09/07/24	1	Thermal Metes	09/07/24	1	T1 & R2	Chalk & Talk ,PPT
41.	11/07/24	2	Wire Anemometers	11/07/24	2	T1 & R1	Chalk & Talk ,PPT
42.	12/07/24	3	Measurement of Displacement	12/07/24	3	T1 & R1	Chalk & Talk ,PPT
43.	13/07/24	3	Measurement of Velocity/ Speed	13/07/24	3	T1 & R1	Chalk & Talk ,PPT
44.	15/07/24	2	Measurement of Acceleration	15/07/24	2	T1 & R1	Chalk & Talk ,PPT

45.	16/07/24	1	Measurement of Force	16/07/24	1	T1 & R1	Chalk & Talk ,PPT
46.	18/07/24	2	Measurement of Torque	18/07/24	2	T1 & R1	Chalk & Talk ,PPT
47.	19/07/24	3	Measurement of Shaft Power	19/07/24	3	T1 & R1	Chalk & Talk ,PPT
48.	22/07/24	2	Measurement of Liquid Level	22/07/24	2	T1 & R1	Chalk & Talk ,PPT
49.	23/07/24	1	Measurement of Viscosity	23/07/24	1	T1 & R1	Chalk & Talk ,PPT
50.	29/07/24	2	Revision of Module 5	29/07/24	2	T1 & R1	Chalk & Talk ,PPT
51.	30/07/24	1	VTU Question Paper Discussion	30/07/24	1	NA	

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list – Assignment	14/06/2024
2	CCE-2 from the above list – Group discussion / Seminar / Case Studies	19/07/2024

#### Text Books:

1. Electrical and Electronic Measurements and instrumentation, R.K Rajput, S. Chand, 3rd Edition, 2013.

#### Reference Book:

1. A Course in Electronics and Electrical Measurements and Instruments, J.B. Gupta, Katson Books, 13<sup>th</sup> Edition, 2008.
2. A Course in Electrical and Electronic Measurements and Instrumentation, A. K. Sawheny, Dhanpat Rai, 2015.

**Faculty**

Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bangalore - 560 080

**HOD**





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**DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Resna S R**

**Academic Year: 2023-24**

**Sub Code & Name: BEE401 & Electric Motors**

**Year/Sem/Section: 2<sup>nd</sup>/4<sup>th</sup> sem**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To study the constructional features of Motors and select a suitable drive for specific Application.

CLO2. To study the constructional features of Three Phase and Single phase induction Motors

CLO3. To study different test to be conducted for the assessment of the performance characteristics of motors.

CLO4. To study the speed control of motor by a different methods

CLO5. Explain the construction and operation of Synchronous motor and special motors

**COURSE OUTCOMES:**

<b>CO1</b>	Understand the construction and operation, characteristics, Testing of DC Motors and determine losses and efficiency
<b>CO2</b>	Understand the construction and operation, classification and types of Three phase Induction motors
<b>CO3</b>	Describe the performance characteristics and applications of three phase Induction motors
<b>CO4</b>	Demonstrate and explain Speed Control methods of three phase induction motor and types of single phase induction motors
<b>CO5</b>	Understand the construction and operation, V and inverted V curves of synchronous motors
<b>CO6</b>	Construction and operation of Universal motor, AC servomotor, Linear induction motor, PMSM, SRM and BLDC motors

### Continuous and Comprehensive Evaluation (CCE)

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/24	1	Construction and working principle-DC motor	22/4/24	1	T1	PPT, Cut sectional view of DC motor
2.	23/4/24	3	Back E.M.F and its significance	23/4/24	3	T1	PPT
3.	25/4/24	3	Torque equation	25/4/24	3	T1	PPT
4.	26/4/24	2	Classification	26/4/24	2	T1	PPT
5.	27/4/24	3	Characteristics of shunt, series & compound motors	27/4/24	3	T1	PPT
6.	29/4/24	1	Speed control of shunt motor	29/4/24	1	T1	PPT
7.	30/4/24	3	Application of motors	30/4/24	3	T1	PPT
8.	2/5/24	3	<b>Losses and Efficiency-</b> Losses in DC motors, power flow diagram, efficiency	2/5/24	3	T1	PPT
9.	3/5/24	2	Condition for maximum efficiency.	3/5/24	2	T1	PPT
10.	6/5/24	1	Testing of DC Motors: Direct & indirect methods of testing of DC motors	6/5/24	1	T1	PPT
11.	7/5/24	3	Swinburne's test	7/5/24	3	T1	PPT
12.	9/5/24	3	Field's test	9/5/24	3	T1	PPT
13.	11/5/24	2	Problems	11/5/24	2	T1	PPT
14.	13/5/24	1	merits and demerits of tests	13/5/24	1	T1	PPT
15.	14/5/24	3	Problems	14/5/24	3	T1	PPT
16.	16/5/24	3	Problems	16/5/24	3	T1	PPT
17.	17/5/24	2	Problems	17/5/24	2	T1	PPT
18.	20/5/24	1	Problems	20/5/24	1	T1	PPT
	21/5/24	3	Three Phase Induction Motors: Concept and generation of rotating magnetic field	21/5/24	3	T1	PPT
19.	23/5/24	3	Principle of operation	23/5/24	3	T1	PPT
20.	24/5/24	2	construction	24/5/24	2	T1	PPT, Cut sectional view
21.	25/5/24	1	classification and types; squirrel-cage, slip-ring	25/5/24	1	T1	PPT
22.	27/5/24	1	Slip and its significance	27/5/24	1	T1	PPT
23.	28/5/24	3	Torque equation	28/5/24	3	T1	PPT
24.	30/5/24	3	Torque-slip characteristic covering motoring, generating and braking regions of operation,	30/5/24	3	T1	PPT

25.	31/5/24	2	Maximum torque	31/5/24	2	T1	PPT
26.	3/6/24	1	Problems	3/6/24	1	T1	PPT
27.	4/6/24	3	Problems	4/6/24	3	T1	PPT
28.	6/6/24	3	Problems	6/6/24	3	T1	PPT
29.	7/6/24	2	Performance of Three-Phase Induction Motor: Phasor diagram of induction motor on no-load and on load	7/6/24	2	T1	PPT
30.	8/6/24	3	Equivalent circuit	8/6/24	3	T1	PPT
31.	13/6/24	3	Losses, efficiency	13/6/24	3	T1	PPT
32.	14/6/24	2	No-load and blocked rotor tests	14/6/24	2	T1	PPT
33.	18/6/24	3	Performance of the motor from the equivalent circuit	18/6/24	3	T1	PPT
34.	20/6/24	3	Cogging and crawling.	20/6/24	3	T1	PPT
35.	21/6/24	2	High torque rotors-double cage and deep rotor bars	21/6/24	2	T1	PPT
36.	24/6/24	1	Induction motor working as induction generator	24/6/24	1	T1	PPT
37.	25/6/24	3	Construction and working of doubly fed induction generator	25/6/24	3	T1	PPT
38.	27/6/24	3	Problems	27/6/24	3	T1	PPT
39.	28/6/24	2	Problems	28/6/24	2	T1	PPT
40.	29/6/24	3	Problems	29/6/24	3	T1	PPT
41.	1/7/24	1	Starting and Speed Control of Three-Phase Induction Motors: Necessity of starter. Direct on line	1/7/24	1	T1	PPT
42.	2/7/24	3	Star-Delta starter	2/7/24	3	T1	PPT
43.	4/7/24	3	Autotransformer starting	4/7/24	3	T1	PPT
44.	5/7/24	2	Rotor resistance starting	5/7/24	2	T1	PPT
45.	8/7/24	1	Speed control by frequency	8/7/24	1	T1	PPT
46.	9/7/24	3	Single-Phase Induction Motor: Double revolving field theory and principle of operation.	9/7/24	3	T1	PPT
47.	11/7/24	3	Construction and operation of split-phase	11/7/24	3	T1	PPT
48.	12/7/24	2	Capacitor start and capacitor run	12/7/24	2	T1	PPT
49.	13/7/24	2	Shaded pole motors	13/7/24	2	T1	PPT
50.	15/7/24	1	Comparison of single phase motors and applications	15/7/24	1	T1	PPT
51.	16/7/24	3	Synchronous Motor: Principle of operation	16/7/24	3	T1	PPT
52.	18/7/24	3	Phasor diagrams-Synchronous motor	18/7/24	3	T1	PPT
53.	19/7/24	2	Torque and torque angle	19/7/24	2	T1	PPT
54.	22/7/24	1	Effect of change in load	22/7/24	1	T1	PPT
55.	23/7/24	3	Effect of change in excitation	23/7/24	3	T1	PPT
56.	25/7/24	3	V and inverted V curves.	25/7/24	3	T1	PPT

57.	26/7/24	2	Synchronous condenser	26/7/24	2	T1	PPT	
58.	27/7/24	1	Other Motors: Construction and operation of Universal motor	27/7/24	1	T1	PPT	
59.	1/8/24	3	AC servomotor	1/8/24	3	T1	PPT	
60.	2/8/24	2	Linear induction motor	2/8/24	2	T1	PPT	
61.	5/8/24	1	PMSM, SRM , BLDC	5/8/24	1	T1	PPT	
62.	6/8/24	3	Revision	6/8/24	3			
Sr. No.	CCE Component						Submission due Date	
1	Assignment						14/6/24	
2	Seminars						26/7/24	

### Text Books:

1. Electric Machines, D. P. Kothari, I. J. Nagrath, McGraw Hill, 4th edition, 2011. 2.. 3.
2. Theory of Alternating Current Machines, Alexander Langsdorf, McGraw Hill, 2nd Edition, 2001
3. Electric Machines, AshfaqHussain, DhanpatRai& Co, 2nd Edition, 2013.

### Reference Book:

1. Electrical Machines, Drives and Power systems, Theodore Wildi, Pearson, 6th Edition, 2014
2. Electrical Machines, M.V. Deshpande, PHI Learning, 2013
3. Electric Machinery and Transformers, Bhag S. Guru at el, Oxford University Press, 3rd Edition, 2012
4. Electric Machinery and Transformers, Irving Kosow, Pearson, 2nd Edition, 2012
5. Principles of Electric Machines and power Electronic, P.C.Sen, Wiley, 2nd Edition, 2013
6. Electrical Machines, R.K. Srivastava, Cengage Learning, 2nd Edition, 2013



**Faculty (Resna S R)**



Professor & Head EEE  
The Oxford College of Engg  
Gommanahalli, Hosur Road  
Bangalore 560 080

**HOD/EEE**



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: SUMITHA T L**

**Academic Year: 2023-24 (EVEN)**

**Subject Code&Name: BEE402 & Transmission and Distribution**

**Year/Sem/Section: 2<sup>nd</sup> year/4<sup>th</sup> semester**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To understand the structure of electrical power system, its components, advantages of high voltage AC and DC transmission, various conductors used for transmission, sag and its calculation, various types of insulators, methods to improve string efficiency.

CLO2. To understand the various transmission line parameters, their effects on transmission of electricity.

CLO3. To understand the various parameters that influences the performance of transmission line and to calculate performance parameters of various transmission lines.

CLO4. To understand corona and its effects, underground cables, its construction, classification, limitations and specifications.

CLO5. To understand and evaluate different types of distribution systems.

**COURSE OUTCOMES:**

<b>CO1</b>	Explain the structure of electrical power system, its components, advantages of high voltage AC and DC transmission, various conductors used for transmission, sag and its calculation, various types of insulators, methods to improve string efficiency.
<b>CO2</b>	Explain various transmission line parameters, their effects on transmission of electricity.
<b>CO3</b>	Evaluate the parameters that influences the performance of transmission line and to calculate performance parameters of various transmission lines.
<b>CO4</b>	Explain corona and its effects, underground cables, its construction, classification, limitations, and specifications.
<b>CO5</b>	Evaluate different types of distribution systems.



SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text/Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	23-04-24	4	<b>Module 1- Introduction to power system:</b> Structure of electric power system - Generation, Transmission and distribution	23-04-24	4	<b>T1</b>	Chalk & Talk, PPT
2.	24-04-24	1	Advantages of high voltage transmission, Feeders, Distributors and Service mains	24-04-24	1	<b>T1</b>	Chalk & Talk
3.	25-04-24	4	HVAC, EHVAC, UHVAC and HVDC transmission	25-04-24	4	<b>T1</b>	Chalk & Talk
4.	27-04-24	4	<b>Overhead transmission lines:</b> Types of supporting structures	27-04-24	4	<b>T1</b>	PPT
5.	30-04-24	4	Line conductors-conventional conductors, ACSR, AAC, AAAC, ATI, ZTAI, GTACSR, GZTACSR, Bundled conductors	30-04-24	4	<b>T1</b>	PPT
6.	02-05-24	4	Importance of sag, Sag calculation of supports at same and different levels	02-05-24	4	<b>T1</b>	Chalk & Talk
7.	03-05-24	3	Problems on sag calculation	03-05-24	3	<b>T1, T2</b>	Chalk & Talk
8.	07-05-24	4	Problems on sag calculation	07-05-24	4	<b>T1, T2</b>	Chalk & Talk
9.	08-05-24	1	Vibration in line and vibration dampers, Protection of OH line against lightning, Ground wires	08-05-24	1	<b>R2, R3</b>	Chalk & Talk
10.	09-05-24	4	<b>Overhead line insulators:</b> Types of insulators and insulator materials-porcelain, toughened glass, polymer	09-05-24	4	<b>T1, T2</b>	PPT
11.	11-05-24	3	Potential distribution over a string of suspension insulators	11-05-24	3	<b>T1, T2</b>	Chalk & Talk
12.	14-05-24	4	Methods of improving string efficiency	14-05-24	4	<b>T1, T2</b>	Chalk & Talk
13.	15-05-24	1	Problems on string efficiency	15-05-24	1	<b>T1, T2</b>	Chalk & Talk
14.	16-05-24	4	<b>Module 2- Line parameters:</b> Introduction to line parameters- Resistance, Inductance and capacitance.	16-05-24	4	<b>T1</b>	Chalk & Talk
15.	17-05-24	3	Inductance of 1-phase & 3-phase lines with equilateral spacing.	17-05-24	3	<b>T1</b>	Chalk & Talk
16.	21-05-24	4	Inductance of three phase lines with unsymmetrical spacing	21-05-24	4	<b>T1</b>	Chalk & Talk
17.	22-05-24	1	Problems on inductance calculation	22-05-24	1	<b>T1, T2</b>	Chalk & Talk
18.	23-05-24	4	Double circuit & transposed lines, Advantages of single & double circuit lines.	23-05-24	4	<b>T1, T2</b>	Chalk & Talk
19.	24-05-24	3	Problems on double circuit lines	24-05-24	3	<b>T1, T2</b>	Chalk & Talk
20.	28-05-24	4	Inductance of composite conductors, Geometric mean radius (GMR) and geometric mean distance (GMD)	28-05-24	4	<b>T1, T2</b>	Chalk & Talk

21.	29-05-24	1	Capacitance of 1-phase & 3-phase lines with equilateral spacing	29-05-24	1	<b>T1, T2</b>	Chalk & Talk
22.	30-05-24	4	Capacitance of three phase lines with unsymmetrical spacing	30-05-24	4	<b>T1, T2</b>	Chalk & Talk
23.	31-05-24	3	Problems on capacitance calculation	31-05-24	3	<b>T1, T2</b>	Chalk & Talk
24.	04-06-24	4	Problems on capacitance calculation	04-06-24	4	<b>T1, T2</b>	Chalk & Talk
25.	05-06-24	1	Problems on double circuit line capacitance calculation	05-06-24	1	<b>T1, T2</b>	Chalk & Talk
26.	06-06-24	4	<b>Module 3- Performance of transmission lines:</b> Classification of lines – Short, Medium and Long lines	06-06-24	4	<b>T1, R2</b>	Chalk & Talk
27.	07-06-24	3	Current and voltage relations, Line regulation and efficiency, ABCD constants in short transmission lines	07-06-24	3	<b>T1, R2</b>	Chalk & Talk
28.	08-06-24	4	Current and voltage relations, Line regulation, ABCD constants in medium lines by Nominal T circuits.	08-06-24	4	<b>T1, R2</b>	Chalk & Talk
29.	13-06-24	4	Current and voltage relations, Line regulation, ABCD constants in medium lines by Nominal $\pi$ circuits.	13-06-24	4	<b>T1, R2</b>	Chalk & Talk
30.	14-06-24	3	Problems on medium transmission lines	14-06-24	3	<b>T1, T2</b>	Chalk & Talk
31.	18-06-24	4	Problems on medium transmission lines	18-06-24	4	<b>T1, T2</b>	Chalk & Talk
32.	19-06-24	1	Problems on medium transmission lines, Ferranti effect	19-06-24	1	<b>T1, T2</b>	Chalk & Talk
33.	20-06-24	4	Current and voltage relations, Line regulation, efficiency, ABCD constants in long lines - hyperbolic form equations	20-06-24	4	<b>T1, T2</b>	Chalk & Talk
34.	21-06-24	3	Equivalent circuit of a long transmission line	21-06-24	3	<b>T1, T2</b>	Chalk & Talk
35.	22-06-24	1	Problems on long transmission lines	22-06-24	1	<b>T1, T2</b>	Chalk & Talk
36.	25-06-24	4	Problems on long transmission lines	25-06-24	4	<b>T1, T2</b>	Chalk & Talk
37.	26-06-24	1	Problems on ABCD constants	26-06-24	1	<b>T1, T2</b>	Chalk & Talk
38.	27-06-24	4	<b>Module 4– Corona:</b> Phenomena of corona, Disruptive and visual critical voltages	27-06-24	4	<b>T2</b>	PPT
39.	28-06-24	3	Corona loss, Advantages and disadvantages of corona	28-06-24	3	<b>T2</b>	PPT
40.	29-06-24	4	Methods of reducing corona, Problems on corona	29-06-24	4	<b>T2</b>	PPT
41.	02-07-24	4	<b>Underground Cables:</b> Types of cables; Construction of cables	02-07-24	4	<b>T1, T2</b>	PPT
42.	03-07-24	1	Insulation resistance, Thermal rating, charging current	03-07-24	1	<b>T1, T2</b>	Chalk & Talk
43.	04-07-24	4	Capacitance of cables, Problems	04-07-24	4	<b>T1, T2</b>	Chalk & Talk

44.	05-07-24	3	Grading of cables-Capacitance grading, Inter-sheath grading	05-07-24	3	T1, T2	Chalk & Talk
45.	09-07-24	4	Problems on capacitance grading of cables	09-07-24	4	T1, T2	Chalk & Talk
46.	10-07-24	1	Problems on capacitance grading of cables	10-07-24	1	T1, T2	Chalk & Talk
47.	11-07-24	4	Grading of cables- Inter-sheath grading	11-07-24	4	T1, T2	Chalk & Talk
48.	12-07-24	3	Problems on intersheath grading of cables	12-07-24	3	T1, T2	Chalk & Talk
49.	13-07-24	3	Problems on intersheath grading of cables	13-07-24	3	T1, T2	Chalk & Talk
50.	16-07-24	4	Dielectric loss, DC and AC cables	16-07-24	4	T1, T2	Chalk & Talk
51.	18-07-24	4	Limitations of cables, Specifications of power cables	18-07-24	4	T1, T2	Chalk & Talk
52.	19-07-24	3	<b>Module 5- Distribution:</b> Primary ac distribution system-Radial feeders, parallel feeders, loop feeders, interconnected network system	19-07-24	3	T1, T2	PPT
53.	23-07-24	4	Secondary ac distribution system-Three phase four wire system, single phase two wire distribution	23-07-24	4	T1, T2	PPT
54.	24-07-24	1	AC distributors with concentrated loads	24-07-24	1	T1, T2	Chalk & Talk
55.	25-07-24	4	AC distributors - problems	25-07-24	4	T1, T2	Chalk & Talk
56.	26-07-24	3	Effect of disconnection of neutral in a 3-phase 4-wire system	26-07-24	3	T1, T2	PPT
57.	01-08-24	4	<b>Reliability and quality of distribution system:</b> Definition of reliability, failure, probability concepts	01-08-24	4	R4, R5	PPT
58.	02-08-24	3	Bath Tub Curve	02-08-24	3	R4, R5	PPT
59.	06-08-24	4	Limitations of distribution system	06-08-24	4	R4, R5	PPT
60.	07-08-24	1	Power quality, Reliability aids	07-08-24	1	R4, R5	PPT

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	Assignment	<b>07-06-24</b>
2	Seminar	<b>26-07-24</b>

**Text Books:**


1. T1: A Course in Electrical Power – Soni Gupta, Bhatnagar, 4<sup>th</sup> edition, Dhanpat Rai, 2011
2. T2: Principles of Power System - V.K. Mehta, Rohit Mehta S. Chand Publishers, 1<sup>st</sup>, Chand publishers, 2013

**Reference Book:**

1. Power System Analysis and Design, J. Duncan Glover et al, Cengage Learning, 4th Edition 2008
2. Electrical power Generation, Transmission and Distribution, S.N. Singh, PHI, 2nd Edition, 2009
3. Electrical Power, S.L.Uppal, Khanna Publication
4. Electrical Power Systems, C. L. Wadhwa, New Age, 5th Edition, 2009
5. Electrical Power Systems, Ashfaq Hussain, CBS Publication
6. Electric Power Distribution, A.S. Pabla, McGraw-Hill, 6th Edition, 2012



**Faculty**



Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bangalore-560 066

**HOD**



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Dr Nisha C Rani**

**Academic Year: 2023-24**

**SUB.CODE&Name: BEE403/Microcontrollers**

**Year/Sem/Section: 2<sup>nd</sup> year/ 4<sup>th</sup> Sem**

**COURSE OBJECTIVES** This course will enable the students to

- CLO1. To explain the internal organization and working of Computers, microcontrollers and embedded processors.
- CLO2. Compare and contrast the various members of the 8051 family.
- CLO3. To explain the registers of the 8051 microcontroller, manipulation of data using registers and MOV instructions.
- CLO4. To explain in detail the execution of 8051 Assembly language instructions and data types.
- CLO5. To explain loop, conditional and unconditional jump and call, handling and manipulation of I/O instructions.
- CLO6. To explain different addressing modes of 8051, arithmetic, logic instructions, and programs.
- CLO7. To explain develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic.
- CLO8. To explain writing assembly language programs for data transfer, arithmetic, Boolean and logical instructions.
- CLO9. To explain writing assembly language programs for code conversions.
- CLO10. To explain writing assembly language programs using subroutines for generation of delays, counters, configuration of SFRs for serial communication and timers.
- CLO11. To perform interfacing of stepper motor and DC motor for controlling the speed.
- CLO12. To explain generation of different waveforms using DAC interface.

**COURSE OUTCOMES:**

<b>CO1</b>	<b>Outline the 8051 architecture, registers, internal memory organization, addressing modes.</b>
<b>CO2</b>	<b>Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming.</b>
<b>CO3</b>	<b>Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.</b>
<b>CO4</b>	<b>Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.</b>
<b>CO5</b>	<b>Program 8051 to work with external devices for ADC, DAC, Stepper motor control, DC motor control And Develop various 8051 based projects.</b>



SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/04/24	2	<b>Module1: 8051 Microcontroller Basics</b> Inside the Computer, Microcontrollers and Embedded Processors,	22/04/24	2	<b>T1</b>	Chalk & board
2.	23/04/24	1	Block Diagram of 8051,	23/04/24	1	<b>T1</b>	ppt
3.	24/04/24	5	PSW and Flag Bits,	24/04/24	5	<b>T1</b>	Chalk & board
4.	26/04/24	4	8051 Register Banks and Stack,	26/04/24	4	<b>T1</b>	Chalk & board
5.	29/04/24	2	Stack Operations	29/04/24	2	<b>T1</b>	Chalk & board
6.	30/04/24	1	Internal Memory Organization of 8051	30/04/24	1	<b>T1</b>	Chalk & board
7.	3/5/24	4	IO Port Usage in 8051	3/5/24	4	<b>T1</b>	Chalk & board
8.	6/5/24	2	Types of Special Function Registers and their uses in 8051	6/5/24	2	<b>T1</b>	Chalk & board
9.	7/5/24	1	Pins of 8051.	7/5/24	1	<b>T1</b>	ppt
10.	8/5/24	5	Memory Address Decoding, 8031/51	8/5/24	5	<b>T1</b>	ppt
11.	11/5/24	4	Interfacing With External ROM And RAM.8051	11/5/24	4	<b>T1</b>	Chalk & board
12.	13/5/24	2	Addressing Modes.	13/5/24	2	<b>T1</b>	Chalk & board
13.	14/5/24	1	<b>Module 2: Assembly Programming and Instruction of 8051</b> Introduction	14/5/24	1	<b>T2</b>	Chalk & board
14.	15/5/24	5	Introduction to 8051 assembly programming Instructions - With Programs	15/5/24	5	<b>T2</b>	Chalk & board
15.	17/5/24	4	Assembling and running an 8051 program	17/5/24	4	<b>T2</b>	Practical based
16.	20/5/24	2	Data types and Assembler directives	20/5/24	2	<b>T2</b>	Chalk & board
17.	21/5/24	1	Arithmetic Instructions - With Programs	21/5/24	1	<b>T2</b>	Practical based
18.	22/5/24	5	Logical Instructions - With Programs	22/5/24	5	<b>T2</b>	Practical based
19.	24/5/24	4	Jump, loop and call instructions	24/5/24	4	<b>T2</b>	Practical based

20.	25/5/24	5	Call Instructions with Programs	25/5/24	5	<b>T2</b>	Chalk & board
21.	27/5/24	2	IO port programming.	27/5/24	2	<b>T2</b>	Chalk & board
22.	28/5/24	1	<b>8051 Programming in C:</b>	28/5/24	1	<b>T2</b>	Chalk & board
23.	29/5/24	5	Data types and time delay in 8051C	29/5/24	5	<b>T2</b>	Chalk & board
24.	31/5/24	4	IO programming in 8051C	31/5/24	4	<b>T2</b>	Chalk & board
25.	3/6/24	2	Logic operations in 8051 C	3/6/24	2	<b>T2</b>	Chalk & board
26.	4/6/24	1	Data conversion program in 8051 C	4/6/24	1	<b>T2</b>	Chalk & board
27.	5/6/24	5	Revision	5/6/24	5	<b>T2</b>	Chalk & board
28.	7/6/24	4	Revision	7/6/24	4	<b>T2</b>	Chalk & board
29.	14/6/24	4	Accessing code ROM space in 8051C, Data serialization using 8051C	14/6/24	4	<b>T2</b>	Chalk & board
30.	18/6/24	1	8051 Timer Programming in Assembly and C	18/6/24	1	<b>T2</b>	Ppt
31.	19/6/24	5	Programming 8051 timers	19/6/24	5	<b>T2</b>	Chalk & board
32.	21/6/24	4	Counter programming	21/6/24	4	<b>T2</b>	Chalk & board
33.	22/6/24	4	Programming timers 0 and 1 in 8051 C	22/6/24	4	<b>T2</b>	Chalk & board
34.	24/6/24	2	<b>Module 4: 8051 Serial Port Programming in Assembly and C:</b>	24/6/24	2	<b>T2</b>	Chalk & board
35.	25/6/24	1	Basics of serial communication	25/6/24	1	<b>T2</b>	ppt
36.	26/6/24	5	8051 connection to RS232	26/6/24	5	<b>T2</b>	ppt
37.	28/6/24	4	8051 serial port programming in assembly	28/6/24	4	<b>T2</b>	Chalk & board
38.	29/6/24	1	Serial port programming in 8051 C.	29/6/24	1	<b>T2</b>	Chalk & board
39.	1/7/24	2	8051 Interrupt Programming in Assembly and C	1/7/24	2	<b>T2</b>	Chalk & board
40.	2/7/24	1	8051 interrupts, Programming	2/7/24	1	<b>T2</b>	Chalk & board
41.	3/7/24	5	timer, external hardware, serial communication interrupt	3/7/24	5	<b>T2</b>	Chalk & board
42.	5/7/24	4	Interrupt priority in 8051/52	5/7/24	4	<b>T2</b>	Chalk & board
43.	8/7/24	2	Interrupt programming in C	8/7/24	2	<b>T2</b>	Chalk & board
44.	9/7/24	1	<b>Module 5: Interfacing: LCD interfacing</b>	9/7/24	1	<b>T2</b>	ppt
45.	10/7/24	5	Keyboard interfacing	10/7/24	5	<b>T2</b>	Ppt

46.	12/7/24	4	ADC, DAC and Sensor Interfacing: ADC 0808 interfacing to 8051	12/7/24	4	<b>T2</b>	Ppt
47.	13/7/24	2	Serial ADC Max1112 ADC interfacing to 8051	13/7/24	2	<b>T2</b>	Ppt
48.	15/7/24	2	DAC interfacing, Sensor interfacing and signal conditioning	15/7/24	2	<b>T2</b>	Ppt
49.	16/7/24	1	Motor Control: Relay, PWM, DC and Stepper Motor	16/7/24	1	<b>T2</b>	Ppt
50.	19/7/24	4	Relays and opt isolators, stepper motor interfacing	19/7/24	4	<b>T2</b>	Ppt
51.	22/7/24	2	DC motor interfacing and PWM	22/7/24	2	<b>T2</b>	Ppt
52.	23/7/24	1	8051 Interfacing with 8255	23/7/24	1	<b>T2</b>	Ppt
53.	24/7/24	5	Programming the 8255, 8255 interfacing	24/7/24	5	<b>T2</b>	Ppt
54.	26/7/24	4	C programming for 8255	26/7/24	4	<b>T2</b>	Chalk and board
55.	27/7/24	1	Revision	27/7/24	1	<b>T2</b>	Chalk & board
56.	2/8/24	4	Revision	2/8/24	4	<b>T2</b>	Chalk & board
57.	5/8/24	2	Revision	5/8/24	2	<b>T2</b>	Chalk & board
58.	6/8/24	1	Revision	6/8/24	1	<b>T2</b>	Chalk & board
59.	7/8/24	5	Question Paper Discussion	7/8/24	5	<b>T2</b>	Chalk & board

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 Assignment	31/05/2024
2	CCE-2 Quiz	19/07/2024

**Text Books:**

1. The 8051 Microcontroller, Kenneth Ayala, Cengage, 3rd Edition, 2005.
2. The 8051 Microcontroller and Embedded Systems Using Assembly and C, Muhammad Ali Mazadi, Pearson, 2<sup>nd</sup> Edition, 2008.

**Reference Book:**

1. Microcontrollers: Architecture, Programming, Interfacing and System Design, Raj Kamal, Pearson, 1st Edition, 2012.

*Nisha.C.Ram*

*J/C Devia*  
 Professor & Head EEE  
 The Oxford College of Engg  
 Bommanahalli, Hosur Road  
 Bangalore -560 068

**Faculty**

**HOD**



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Administrative Office:

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Department of Electrical & Electronics Engineering**

**LESSON PLAN**

**Faculty Name:** Dr.B.Devi Vighneshwari

**Academic Year:** 2023 – 2024 (Even)

**Sub Code &Name:** BEE405A & Electrical Power Generation and Economics

**Year/Sem/Section:** 2<sup>nd</sup> /4<sup>th</sup>

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To understand the basics of hydroelectric power plant, merits and demerits of hydroelectric power plants, site selection, arrangement and elements of hydroelectric plant.

CLO2. To understand the working, site selection and arrangement of Steam, Diesel and Gas Power Plants.

CLO3. To understand the working, site selection and arrangement of Nuclear Power Plants.

CLO4. To understand importance of different equipment's in substation, Interconnection of power stations and different types of grounding.

CLO5. To understand the economics of power generation

**COURSE OUTCOMES:**

<b>CO1</b>	Explain the basics of hydroelectric power plant, merits and demerits of hydroelectric power plants, site selection, arrangement and elements of hydroelectric plant.
<b>CO2</b>	Explain the working, site selection and arrangement of Steam, Diesel and Gas Power Plants.
<b>CO3</b>	Explain the working, site selection and arrangement of Nuclear Power Plants.
<b>CO4</b>	Explain the importance of different equipment's in substation, Interconnection of power stations and different types of grounding.
<b>CO5</b>	Explain the economics of power generation.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/04/24	3	Hydrology, Run off and stream flow,	22/04/24	3	T1 & R1	Chalk & Talk ,PPT
2.	23/04/24	2	Hydrograph, Flow duration	23/04/24	2	T1 & R1	Chalk &



			curve.				Talk ,PPT
3.	29/04/24	3	Mass curve, Reservoir capacity, Dam storage.	29/04/24	3	T1 & R1	Chalk & Talk ,PPT
4.	30/04/24	2	Hydrological cycle, Merits and demerits of hydroelectric power plants, Selection of site. Elements of the plant	30/04/24	2	T1 & R1	Chalk & Talk ,PPT
5.	02/05/24	1	General arrangement of hydel plant	02/05/24	1	T1 & R1	Chalk & Talk ,PPT
6.	03/05/24	5	Classification of the plants based on water flow regulation Water head and type of load the plant has to supply	03/05/24	5	T1 & R1	Chalk & Talk ,PPT
7.	06/05/24	3	Water Turbines Pelton,Francis Kaplan Characteristic of water turbines Governing of turbines.	06/05/24	3	T1 & R1	Chalk & Talk ,PPT
8.	07/05/24	2	Selection of water turbines.	07/05/24	2	T1 & R1	Chalk & Talk ,PPT
9.	09/05/24	1	Underground, Small hydro and pumped storage plants.	09/05/24	1	T1 & R1	Chalk & Talk ,PPT
10.	11/05/24	5	Choice of size and number of units, Plant layout and auxiliaries.	11/05/24	5	T1 & R1	Group Learning
11.	13/05/24	3	Introduction, Efficiency of steam plants, Merits and demerits of plants, Selection of site	13/05/24	3	T2 & R2	Chalk & Talk ,PPT
12.	14/05/24	2	Working of steam plant, Power plant equipment and layout	14/05/24	2	T2 & R2	Chalk & Talk ,PPT
13.	16/05/24	1	Steam turbines, Fuels and fuel handling,	16/05/24	1	T2 & R2	Chalk & Talk ,PPT
14.	17/05/24	5	Fuel combustion and combustion equipment	17/05/24	5	T2 & R2	Chalk & Talk ,PPT
15.	20/05/24	3	Coal burners, Fluidized bed combustion, Combustion control, Ash handling, Dust collection, Draught systems, Feed water, Steam power plant controls, Plant auxiliaries.	20/05/24	3	T2 & R2	Chalk & Talk ,PPT
16.	21/05/24	2	Introduction, Merits and demerits, Selection site.	21/05/24	2	T2 & R2	Chalk & Talk ,PPT Videos
17.	23/05/24	1	Elements of diesel power	23/05/24	1	T2 & R2	Group

			plant, Applications				Learning
18.	24/05/24	5	Introduction, Merits and demerits, Selection site, Fuels for gas turbines	24/05/24	5	T2 & R2	Chalk & Talk ,PPT
19.	25/05/24	3	Elements of simple gas turbine power plant, Methods of improving thermal efficiency of a simple steam power plant	25/05/24	3	T2 & R2	Chalk & Talk ,PPT
20.	27/05/24	3	Closed cycle gas turbine power plants Comparison.	27/05/24	3	T2 & R2	Chalk & Talk ,PPT
21.	28/05/24	2	<b>Module 3: Nuclear Power Plant</b>	28/05/24	2	T1 & R3	Chalk & Talk ,PPT
22.	30/05/24	1	Nuclear reaction, Nuclear fission process,	30/05/24	1	T1 & R3	Chalk & Talk ,PPT
23.	31/05/24	5	Nuclear chain reaction, Nuclear energy	31/05/24	5	T1 & R3	Problem Based Learning
24.	03/06/24	3	Nuclear fuel	03/06/24	3	T1 & R3	Chalk & Talk ,PPT
25.	04/06/24	2	Nuclear plant and layout	04/06/24	2	T1 & R3	Chalk & Talk ,PPT
26.	06/06/24	1	Nuclear reactor and its control, Classification of reactors	06/06/24	1	T1 & R3	Chalk & Talk ,PPT
27.	07/06/24	5	Power reactors in use, Effects of nuclear plants	07/06/24	5	T1 & R3	Chalk & Talk ,PPT
28.	08/06/24	2	Disposal of nuclear waste and effluent, Shielding	08/06/24	2	T1 & R3	Problem Based Learning
29.	13/06/24	1	<b>Module-4: Substations</b> Introduction to Substation equipment, Transformers, High Voltage Fuses	13/06/24	1	T3 & R3	Chalk & Talk ,PPT
30.	14/06/24	5	High Voltage Circuit Breakers	14/06/24	5	T3 & R3	Chalk & Talk ,PPT
31.	18/06/24	2	Protective Relaying, Lightning Arresters	18/06/24	2	T3 & R3	Chalk & Talk ,PPT
32.	20/06/24	1	High voltage Disconnect Switches	20/06/24	1	T3 & R3	Chalk & Talk ,PPT
33.	21/06/24	5	High Voltage Insulators and Conductors	21/06/24	5	T3 & R3	Chalk & Talk ,PPT
34.	24/06/24	3	High Voltage Insulators and Conductors, Voltage Regulators	24/06/24	3	T3 & R3	Chalk & Talk ,PPT
35.	25/06/24	2	Storage Batteries Reactors, Capacitors, Measuring Instruments	25/06/24	2	T3 & R3	Chalk & Talk ,PPT
36.	27/06/24	1	power line carrier communication equipment	27/06/24	1	T3 & R3	Chalk & Talk ,PPT

37.	28/06/24	5	Classification of substations – indoor and outdoor, Selection of site for substation	28/06/24	5	T3 & R3	Chalk & Talk ,PPT
38.	29/06/24	1	Busbar arrangement schemes and single line diagrams of substations	29/06/24	1	T3 & R3	Chalk & Talk ,PPT
39.	01/07/24	3	Interconnection of power stations,	01/07/24	3	T3 & R3	Chalk & Talk ,PPT Videos
40.	02/07/24	2	Introduction to gas insulated substation Advantages and economics of Gas insulated substation	02/07/24	2	T1 & R3	Chalk & Talk ,PPT
41.	04/07/24	1	Grounding: Introduction, Difference between grounded and ungrounded system. Grounding transformer.	04/07/24	1	T1 & R1	Chalk & Talk ,PPT
42.	05/07/24	5	System grounding – ungrounded,	05/07/24	5	T1 & R1	Chalk & Talk ,PPT
43.	08/07/24	3	Solid grounding Resistance grounding, Reactance grounding	08/07/24	3	T1 & R1	Chalk & Talk ,PPT
44.	09/07/24	2	Resonant grounding. Earthing transformer Neutral grounding Neutral grounding transformer	09/07/24	2	T1 & R1	Chalk & Talk ,PPT
45.	11/07/24	1	<b>Module:5 Economics</b> Introduction, Effect of variable load on power system, classification of costs, Cost analysis. Interest and Depreciation	11/07/24	1	T1 & R1	Chalk & Talk ,PPT
46.	12/07/24	5	Methods of determination of depreciation	12/07/24	5	T1 & R1	Chalk & Talk ,PPT
47.	13/07/24	5	Choice of size and number of generating plants Tariffs,	13/07/24	5	T1 & R1	Chalk & Talk ,PPT
48.	15/07/24	3	Types of consumers and their tariff. Power factor.	15/07/24	3	T1 & R1	Chalk & Talk ,PPT
49.	16/07/24	2	comparison of methods of improving the power factor Problems	16/07/24	2	T1 & R1	Chalk & Talk ,PPT
50.	18/07/24	1	Economics of Power generation.	18/07/24	1	T1 & R1	Chalk & Talk ,PPT
51.	19/07/24	5	Objective, factors affecting the tariff, types.	19/07/24	5	T3 & R3	Chalk & Talk ,PPT
52.	22/07/24	3	Power factor. Disadvantages and causes of low power factor	22/07/24	3	T3 & R3	Chalk & Talk ,PPT

53.	23/07/24	2	different terms considered for power plants and their significance, load sharing.	23/07/24	2	T3 & R3	Chalk & Talk ,PPT
54.	25/07/24	1	Numericals	25/07/24	1	T3 & R3	Chalk & Talk
55.	26/07/24	5	Numericals	26/07/24	5	T3 & R3	Chalk & Talk
56.	27/07/24	3	Question Paper Discussion – Module 1	27/07/24	3	NA	Chalk & Talk
57.	01/08/24	1	Question Paper Discussion - Module 2	01/08/24	1	NA	Chalk & Talk
58.	02/08/24	5	Question Paper Discussion – Module 3	02/08/24	5	NA	Chalk & Talk
59.	05/08/24	3	Question Paper Discussion - Module 4	05/08/24	3	NA	Chalk & Talk
60.	06/08/24	2	Question Paper Discussion – Module 5	06/08/24	2	NA	Chalk & Talk

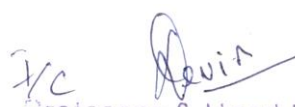
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list – Assignment	14/06/2024
2	CCE-2 from the above list – Group discussion / Seminar / Case Studies	19/07/2024

**Text Books:**

1. Power Plant Engineering, P.K. Nag, Mc Graw Hill, 4 th Edition, 2014
2. Generation of Electrical Energy, B.R.Gupta, S. Chand, 2015
3. Electrical power Generation, Transmission and Distribution, S.N. Singh, PHI, 2 nd Edition, 2009

**Reference Book:**

1. A Course in Power Systems, J.B. Gupta, Katson, 2008
2. Electrical Power Distribution Systems, V. Kamaraju, McGrawHill, 1 st Edition, 2009
3. A Text Book on Power System Engineering, A. Chakrabarti, et al, Dhanpath Rai, 2 nd Edition, 2010

  
 Professor & Head EEE  
 The Oxford College of Engg  
 Bommanahalli, Hosur Road  
 Bangalore -560 066



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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### Department of Electrical and Electronics Engineering

### LESSON PLAN

**Faculty Name: Dr Nisha C Rani**

**Academic Year: 2023-24 (Even )**

**SUB.CODE&Name: BEEE203 Elements of Electrical Engineering**

**Year/Sem/Section: I Year/2<sup>nd</sup> Sem /P3**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To explain the basic laws used in the analysis of DC circuits, electromagnetism.

CLO2. To explain the behavior of circuit elements in single-phase circuits.

CLO3. To explain three phase circuits, balanced loads and measurement of three phase power.

CLO4. To explain the measuring techniques, measuring instruments and domestic wiring.

CLO5. To explain electricity billing, equipment and personal safety measures.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Understand the concepts of DC circuits and Electromagnetism.
<b>CO2</b>	Understand the concepts of single phase and Three phase AC circuits.
<b>CO3</b>	Apply the basic Electrical laws to solve circuits.
<b>CO4</b>	Understand the concepts of measurements and measuring Instruments
<b>CO5</b>	Explain the concepts of domestic wiring, electricity billing, circuit protective devices and personal safety measures.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	6/3/24	1	DC circuits: Ohm's law	6/3/24	1	T1,T2,R2	Chalk and talk
2.	7/3/24	2	Numericals	7/3/24	2	T1,T2,R2	Chalk and talk
3.	12/3/24	3	Analysis of series, parallel and series-parallel circuits	12/3/24	3	T1,T2,R2	Chalk and talk
4.	13/3/24	1	Numericals	13/3/24	1	T1,T2,R2	Chalk and talk
5.	14/3/24	2	Numericals	14/3/24	2	T1,T2,R2	Chalk and talk
6.	15/3/24	6	Kirchhoff's laws,	15/3/24	6	T1,T2,R2	Chalk and talk



7.	19/3/24	3	Numericals	19/3/24	3	<b>T1,T2,R2</b>	Chalk and talk
8.	20/3/24	1	Power and energy.	20/3/24	1	<b>T1,T2,R2</b>	Chalk and talk
9.	21/3/24	2	<b>Electromagnetism</b>	21/3/24	2	<b>T1,T2,R2</b>	Chalk and talk
10.	22/3/24	6	Faraday's Laws of Electromagnetic Induction	22/3/24	6	<b>T1,T2,R2</b>	Chalk and talk
11.	23/3/24	3	Lenz's Law, Flemings rules	23/3/24	3	<b>T1,T2,R2</b>	Chalk and talk
12.	26/3/24	3	statically and dynamically induced EMF	26/3/24	3	<b>T1,T2,R2</b>	Chalk and talk
13.	27/3/24	1	concepts of self and mutual inductance	27/3/24	1	<b>T1,T2,R2</b>	Chalk and talk
14.	28/3/24	2	Coefficient of Coupling.	28/3/24	2	<b>T1,T2,R2</b>	Chalk and talk
15.	30/3/24	1	Energy stored in magnetic field.	30/3/24	1	<b>T1,T2,R2</b>	Chalk and talk
16.	2/4/24	3	Simple Numerical.	2/4/24	3	<b>T1,T2,R2</b>	Chalk and talk
17.	3/4/24	2	<b>Single-phase AC circuits:</b> ,	3/4/24	2	<b>T1,T2,R2</b>	Chalk and talk
18.	4/4/24	1	Generation of sinusoidal voltage	4/4/24	1	<b>T1,T2,R2</b>	Chalk and talk
19.	5/4/24	6	frequency of generated voltage, average value	5/4/24	6	<b>T1,T2,R2</b>	Chalk and talk
20.	10/4/24	1	RMS value, form factor and peak factor of sinusoidal voltage and currents	10/4/24	1	<b>T1,T2,R2</b>	Chalk and talk
21.	12/4/24	6	Phasor representation of alternating quantities	12/4/24	6	<b>T1,T2,R2</b>	Chalk and talk
22.	13/4/24	2	Analysis of R, L, C, circuits with phasor diagrams,	13/4/24	2	<b>T1,T2,R2</b>	Chalk and talk
23.	16/4/24	3	Analysis of R-L,R-C and circuits with phasor diagrams,	16/4/24	3	<b>T1,T2,R2</b>	Chalk and talk
24.	17/4/24	2	Analysis R-L-C circuits with phasor diagrams,	17/4/24	2	<b>T1,T2,R2</b>	Chalk and talk
25.	18/4/24	1	Real power, reactive power, apparent power, and Power factor.	18/4/24	1	<b>T1,T2,R2</b>	Chalk and talk
26.	19/4/24	6	Series, Parallel and circuits. Simple Numerical.	19/4/24	6	<b>T1,T2,R2</b>	Chalk and talk
27.	23/4/24	3	Series-Parallel circuits. Simple Numerical.	23/4/24	3	<b>T1,T2,R2</b>	Chalk and talk
28.	24/4/24	1	<b>Three-phase AC circuits:</b> Generation of 3-phase power. Definition of phase sequence. Balanced supply and balanced load.	24/4/24	1	<b>T1,T2,R2</b>	Chalk and talk
29.	25/4/24	2	Relationship between line and phase values of balanced star connections.	25/4/24	2	<b>T1,T2,R2</b>	Chalk and talk
30.	26/4/24	6	Relationship between line and phase values of	26/4/24	6	<b>T1,T2,R2</b>	Chalk and talk

			balanced delta connections.				
31.	27/4/24	2	Revision	27/4/24	2	T1,T2,R2	Chalk and talk
32.	7/5/24	3	Necessity and advantage of 3-phase system.	7/5/24	3	T1,T2,R2	Chalk and talk
33.	8/5/24	1	Power in balanced 3-phase circuits..	8/5/24	1	T1,T2,R2	Chalk and talk
34.	9/5/24	2	Measurement of 3-phase power by 2-wattmeter method	9/5/24	2	T1,T2,R2	Chalk and talk
35.	11/5/24	6	Simple Numerical	11/5/24	6	T1,T2,R2	Chalk and talk
36.	14/5/24	3	<b>Measuring instruments:</b> Introduction	14/5/24	3	T1,T2,R2	Chalk and talk
37.	15/5/24	1	construction and working principle of whetstone's bridge,	15/5/24	1	T1,T2,R2	Chalk and talk
38.	16/5/24	4	Kelvin's double bridge,	16/5/24	4	T1,T2,R2	Chalk and talk
39.	17/5/24	6	Megger,	17/5/24	6	T1,T2,R2	Chalk and talk
40.	21/5/24	3	Maxwel's bridge for inductance,	21/5/24	3	T1,T2,R2	Chalk and talk
41.	22/5/24	1	Schering's bridge for capacitance	22/5/24	1	T1,T2,R2	Chalk and talk
42.	23/5/24	2	concepts of current transformer and potential transformer. (Only balance equations and Excluding Vector diagram approach)	23/5/24	2	T1,T2,R2	Chalk and talk
43.	24/5/24	6	<b>Domestic Wiring:</b> Requirements,	24/5/24	6	T1,T2,R2	PPT
44.	25/5/24	3	Types of wiring: casing, capping.	25/5/24	3	T1,T2,R2	PPT
45.	28/5/24	3	Two way and three way control of load.	28/5/24	3	T1,T2,R2	PPT
46.	29/5/24	1	<b>Electricity bill:</b> Power rating of household appliances including air conditioners, PCs, laptops, printers, etc. calculation of electricity	29/5/24	1	T1,T2,R2	PPT
47.	30/5/24	2	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	30/5/24	2	T1,T2,R2	PPT
48.	31/5/24	6	calculation of electricity bill for domestic consumers.	31/5/24	6	T1,T2,R2	PPT
49.	4/6/24	3	<b>Equipment Safety measures:</b>	4/6/24	3	T1,T2,R2	PPT
50.	5/6/24	1	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	5/6/24	1	T1,T2,R2	PPT
51.	6/6/24	2	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	6/6/24	2	T1,T2,R2	Animated Video
52.	7/6/24	6	<b>Personal safety measures:</b> Electric Shock,	7/6/24	6	T1,T2,R2	PPT

<b>53.</b>	8/6/24	3	Earthing and its types,	8/6/24	3	<b>T1,T2,R2</b>	PPT
<b>54.</b>	11/6/24	3	Safety Precautions to avoid shock	11/6/24	3	<b>T1,T2,R2</b>	PPT
<b>55.</b>	12/6/24	1	Residual Current Circuit Breaker (RCCB) and	12/6/24	1	<b>T1,T2,R2</b>	Animated Video
<b>56.</b>	13/6/24	2	Earth Leakage Circuit Breaker (ELCB).	13/6/24	2	<b>T1,T2,R2</b>	Animated Video
<b>57.</b>	14/6/24	6	Revision	14/6/24	6	<b>T1,T2,R2</b>	Chalk and talk
<b>58.</b>	18/6/24	3	VTU Question Paper Discussion	18/6/24	3	<b>T1,T2,R2</b>	Chalk and talk
<b>59.</b>	19/6/24	1	VTU Question Paper Discussion	19/6/24	1	<b>T1,T2,R2</b>	Chalk and talk
<b>60.</b>	20/6/24	2	Revision	20/6/24	2	<b>T1,T2,R2</b>	Chalk and talk
<b>61.</b>	21/6/24	6	Revision	21/6/24	6	<b>T1,T2,R2</b>	Chalk and talk
<b>62.</b>	22/6/24	1	Revision	22/6/24	1	<b>T1,T2,R2</b>	Chalk and talk
<b>63.</b>	28/6/24	3	Revision	28/6/24	3	<b>T1,T2,R2</b>	Chalk and talk
<b>64.</b>	29/6/24	1	Revision	29/6/24	1	<b>T1,T2,R2</b>	Chalk and talk

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	CCE-1 Assignment	<b>17/05/24</b>
2	CCE-2 Seminar	<b>11/06/24</b>

### Text Books:

- 1 Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

### Reference Book:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.
3. Electrical Technology by E. Hughes, Pearson, 12th Edition, 2016.
4. Electrical and electronic measurements and instrumentation by A K Sawhney, Dhanapat Rai and Co. edition, January 2015

*Nisha. C. Rami*

**Faculty**

*J/c* *Devit*  
Professor & Head EEE  
The Oxford College of Engg  
Dommanahalli, Hosur Road  
Bangalore-560 060

**HOD**

IOAC



**CHILDREN'S EDUCATION SOCIETY (Regd.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

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2(f))

Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### **DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING**

#### **LESSON PLAN**

**Faculty Name: Resna S R**

**Academic Year: 2023 – 2024 (Even)**

**Sub Code & Name: BESCK204B & Introduction to Electrical Engineering**

**Year/Sem/Section: I<sup>st</sup>/II<sup>nd</sup>/C1&C6**

#### **COURSE OBJECTIVES**

This course will enable the students to

CLO1. To explain the laws used in the analysis of DC and AC circuits.

CLO2. To explain the behavior of circuit elements in single-phase circuits.

CLO3. To explain the construction and operation of transformers, DC generators and motors and induction motors

CLO4. To introduce concepts of circuit protecting devices and earthing.

CLO5. To explain electric power generation, transmission and distribution, electricity billing, equipment and personal safety measures.

#### **COURSE OUTCOMES:**

CO1	Understand the concepts of various energy sources and Electric circuits
CO2	Apply the basic Electrical laws to solve circuits.
CO3	Discuss the construction and operation of various Electrical Machines.
CO4	Identify suitable Electrical machine for practical implementation
CO5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/03/24	2	Introduction to syllabus			T1	Chalk & Talk ,PPT
2.	12/03/24	1	Module1 Introduction: Conventional and non-conventional energy resources; General structure of electrical			T1	Chalk &Talk ,PPT



			power systems using single line diagram approach.				
3.	14/03/24	2	Power Generation: Hydel, Nuclear power generation (Block Diagram approach).			T1	Chalk & Talk ,PPT
4.	15/03/24	5	Solar & wind power generation (Block Diagram approach).			T1	Chalk & Talk ,PPT
5.	18/03/24	2	D.C.Circuits: Electric circuit, active and passive elements, dependent source and independent source, Ohm's Law and limitations			T1	Chalk & Talk ,PPT
6.	19/03/24	1	Analysis of Series, Parallel, & Series-Parallel circuits .			T1	Chalk & Talk
7.	21/03/24	2	problems			T1	Chalk & Talk
8.	22/03/24	5	problems			T1	Chalk & Talk
9.	23/03/24	2	Kirchhoff's voltage and current Law(KCL&KVL), power, energy			T1	Chalk & Talk
10.	25/03/24	2	problems			T1	Chalk & Talk
11.	26/03/24	1	Problems			T1	Chalk & Talk ,PPT
12.	28/03/24	2	Module2 A.C. Fundamentals: Equation of AC Voltage and current ,Definition of time period, frequency, amplitude, phase, phase difference.			T1	Chalk & Talk
13.	30/03/24	1	Average value, RMS value, form factor, peak factor			T1	Chalk & Talk ,
14.	01/04/24	2	Analysis of Resistive and inductive circuit with Phasor diagram			T1	Chalk & Talk
15.	02/04/24	1	Problems on resistive and inductive load			T1	Chalk & Talk
16.	04/04/24	2	Problems on resistive and inductive load			T1	Chalk & Talk
17.	05/04/24	5	Analysis of Capacitive circuit with Phasor diagram+problems			T1	Chalk & Talk
18.	08/04/24	2	Analysis of RL circuits with Phasor diagrams			T1	Chalk & Talk
19.	12/04/24	5	Analysis of RC circuits with Phasor diagrams			T1	Chalk & Talk
20.	13/04/24	1	Analysis of RLC circuits with Phasor diagrams			T1	Chalk & Talk
21.	15/04/24	2	Real power, Reactive power, Apparent Power and Power factor			T1	Chalk & Talk
22.	16/04/24	1	Problems on series circuits			T1	Chalk & Talk
23.	18/04/24	2	Problems on series circuits			T1	Chalk & Talk
24.	19/04/24	5	Three Phase circuits: Generation of 3 phase power, Advantages and limitations of 3-phase power.			T1	Chalk & Talk ,PPT

25.	22/04/24	2	Voltage and current relations in star and delta connections.			T1	Chalk & Talk ,PPT
26.	23/04/24	1	Module 3: DC Machines: DC Generator: Principle of operation, constructional details			T1	Chalk & Talk ,PPT
27.	25/04/24	2	Induced emf expression, Types of generators			T1	Chalk & Talk ,PPT
28.	26/04/24	5	The relation between induced emf and terminal voltage and problems			T1	Problem Based Learning
29.	27/04/24	2	problems			T1	Chalk & Talk ,PPT
30.	06/05/24	1	problems			T1	Chalk & Talk ,PPT
31.	07/05/24	2	problems			T1	Chalk & Talk ,PPT
32.	09/05/24	5	DC Motor: Principle of operation			T1	Chalk & Talk ,PPT
33.	11/05/24	2	Back emf and its significance, torque equations			T1	Chalk & Talk ,PPT
34.	13/05/24	1	Types of motors, characteristics (shunt and series only), and applications.			T1	Chalk & Talk ,PPT
35.	14/05/24	2	Speed control (shunt and series only)			T1	Chalk & Talk ,PPT
36.	16/05/24	5	problems			T1	Chalk & Talk ,PPT
37.	17/05/24	2	problems			T1	Chalk & Talk ,PPT
38.	20/05/24	2	problems			T1	Chalk & Talk ,PPT
39.	21/05/24	1	Module 4: Single Phase Transformers: Necessity of transformer, Principle of operation.			T2	Chalk & Talk ,PPT Videos
40.	23/05/24	2	Types and construction of transformers.			T2	Chalk & Talk ,PPT
41.	24/05/24	5	EMF equation, losses.			T2	Chalk & Talk ,PPT
42.	25/05/24	2	Problems on emf equation			T2	Chalk & Talk ,PPT
43.	27/05/24	2	Variation of losses with respect to load, efficiency.			T2	Chalk & Talk ,PPT
44.	28/05/24	1	Condition for maximum efficiency.			T2	Chalk & Talk ,PPT
45.	30/05/24	2	problems			T2	Chalk & Talk ,PPT
46.	31/05/24	5	problems			T2	Chalk & Talk ,PPT
47.	03/06/24	2	Introduction to syllabus			T2	Chalk & Talk ,PPT
48.	04/06/24	1	Module1 Introduction: Conventional and non-conventional energy resources; General structure of electrical power systems using single line diagram approach.			T2	Chalk & Talk ,PPT
49.	06/06/24	2	problems			T1	Chalk & Talk ,PPT
50.	07/06/24	5	Three Phase Induction Motors: Principle of operation and			T1	Chalk & Talk ,PPT

			concept of rotating magnetic field.				
51.	08/06/24	2	Construction and types of three-phase induction motor.			T1	Chalk & Talk ,PPT
52.	10/06/24	2	Working principle of three-phase induction motor.			T1	Chalk & Talk ,PPT
53.	11/06/24	1	Types – squirrel cage and wound rotor			T1	Chalk & Talk ,PPT
54.	13/06/24	2	Slip and its significance.			T1	Chalk & Talk
55.	14/06/24	5	problems			T1	Chalk & Talk
56.	18/06/24	1	problems			T1	Chalk & Talk
57.	19/06/24	2	Module 5: Domestic Wiring: Requirements, Types of wiring: casing, capping. Two way and three way control of load.			T1	PPT
58.	20/06/24	2	Electricity bill: Power rating of household appliances including air conditioners, PCs, laptops, printers,etc.			T1	Chalk & Talk
59.	21/06/24	5	Definition of “unit” used for consumption of electrical energy, two-part electricity tariff, Calculation of electricity bill for domestic consumers.			T1	Chalk & Talk
60.	22/06/24	5	Equipment Safety measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits			T1	Chalk & Talk
61.	28/06/24	5	Personal safety measures: Earthing an its types			T1	Chalk & Talk
62.	29/06/24	2	Electric Shock, Safety precautions to avoid Shock.			T1	Chalk & Talk

### Continuous and Comprehensive Evaluation (CCE)

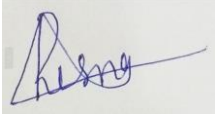
Sl. No.	CCE Component	Submission due Date
1	Assignment	10/05/2024
2	Quiz	06/06/2024

### Text Books:

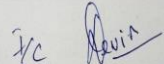
1. Basic Electrical Engineering”, D C Kulshreshtha, TMH, Revised first edition.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

### **Reference Books:**

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2012.
- 2 Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015
3. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3rd edition, 2014.



**Faculty (Resna S R)**



J/c Resna  
Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bangalore-560 069

**HOD/EEE**

IOAC



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: SUMITHA T L**

**Academic Year: 2023-24 (EVEN)**

**Subject Code&Name: BESCK204B & Introduction to Electrical Engineering**

**Year/Sem/Section: 1<sup>st</sup> year/2<sup>nd</sup> semester/C2(CSE) & C5(ISE)**

**COURSE OBJECTIVES:**

This course will enable the students to

CLO1. To explain the laws used in the analysis of DC and AC circuits.

CLO2. To explain the behavior of circuit elements in single-phase circuits.

CLO3. To explain the construction and operation of transformers, DC generators and motors and induction motors.

CLO4. To introduce concepts of circuit protecting devices and earthing.

CLO5. To explain electric power generation, transmission and distribution, electricity billing, equipment and personal safety measures.

**COURSE OUTCOMES:**

<b>CO1</b>	Understand the concepts of various energy sources and Electric circuits
<b>CO2</b>	Apply the basic Electrical laws to solve circuits.
<b>CO3</b>	Discuss the construction and operation of various Electrical Machines.
<b>CO4</b>	Identify suitable Electrical machine for practical implementation
<b>CO5</b>	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text/ Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/03/24	2	<b>Module1</b> Introduction: Conventional and non-conventional energy resources; General structure of electrical power systems using single line diagram	11/03/24	2	<b>T1</b>	Chalk & Talk, PPT
2.	12/03/24	1	<b>Power Generation:</b> Hydrel, Nuclear power generation (Block Diagram	12/03/24	1	<b>T1</b>	Chalk & Talk



			approach).				
3.	14/03/24	2	Solar & wind power generation (Block Diagram approach).	14/03/24	2	T1	Chalk & Talk, PPT
4.	15/03/24	5	<b>D.C.Circuits:</b> Electric circuit, active and passive elements, dependent source and independent source, Ohm's Law and limitations	15/03/24	5	T1	Chalk & Talk
5.	18/03/24	2	Analysis of Series, Parallel, & Series-Parallel circuits	18/03/24	2	T1	Chalk & Talk
6.	19/03/24	1	problems	19/03/24	1	T1	Chalk & Talk
7.	21/03/24	2	problems	21/03/24	2	T1, T2	Chalk & Talk
8.	22/03/24	5	Kirchhoff's voltage and current Law(KCL&KVL), power, energy	22/03/24	5	T1, T2	Chalk & Talk
9.	23/03/24	2	problems	23/03/24	2	R2, R3	Chalk & Talk
10.	25/03/24	2	Problems	25/03/24	2	T1, T2	Chalk & Talk
11.	26/03/24	1	<b>Module2 A.C. Fundamentals:</b> Equation of AC Voltage and current, Definition of time period, frequency, amplitude, phase, phase difference.	26/03/24	1	T1, T2	Chalk & Talk
12.	28/03/24	2	Average value, RMS value, form factor, peak factor	28/03/24	2	T1, T2	Chalk & Talk
13.	30/03/24	1	Analysis of Resistive and inductive circuit with Phasor diagram	30/03/24	1	T1, T2	Chalk & Talk
14.	01/04/24	2	Problems on resistive and inductive load	01/04/24	2	T1	Chalk & Talk
15.	02/04/24	1	Problems on resistive and inductive load	02/04/24	1	T1	Chalk & Talk
16.	04/04/24	2	Analysis of Capacitive circuit with Phasor diagram+problems	04/04/24	2	T1	Chalk & Talk
17.	05/04/24	5	Analysis of RL circuits with Phasor diagrams	05/04/24	5	T1, T2	Chalk & Talk
18.	08/04/24	2	Analysis of RC circuits with Phasor diagrams	08/04/24	2	T1, T2	Chalk & Talk
19.	12/04/24	5	Analysis of RLC circuits with Phasor diagrams	12/04/24	5	T1, T2	Chalk & Talk
20.	13/04/24	1	Real power, Reactive power, Apparent Power and Power factor	13/04/24	1	T1, T2	Chalk & Talk
21.	15/04/24	2	Problems on series circuits	15/04/24	2	T1, T2	Chalk & Talk
22.	16/04/24	1	Problems on series circuits	16/04/24	1	T1, T2	Chalk & Talk
23.	18/04/24	2	<b>Three Phase circuits:</b> Generation of 3 phase power, Advantages and limitations of 3-phase power.	18/04/24	2	T1, T2	Chalk & Talk
24.	19/04/24	5	Voltage and current relations in star and	19/04/24	5	T1, T2	Chalk & Talk

			delta connections.	4			
25.	22/04/24	2	<b>Module 3: DC Machines:</b> <b>DC Generator:</b> Principle of operation, constructional details	22/04/24	2	<b>T1, T2</b>	Chalk & Talk
26.	23/04/24	1	Induced emf expression, Types of generators	23/04/24	1	<b>T1, R2</b>	Chalk & Talk
27.	25/04/24	2	The relation between induced emf and terminal voltage and problems	25/04/24	2	<b>T1, R2</b>	Chalk & Talk
28.	26/04/24	5	problems	26/04/24	5	<b>T1, R2</b>	Chalk & Talk
29.	27/04/24	2	problems	27/04/24	2	<b>T1, R2</b>	Chalk & Talk
30.	06/05/24	1	problems	06/05/24	1	<b>T1, T2</b>	Chalk & Talk
31.	07/05/24	2	<b>DC Motor:</b> Principle of operation	07/05/24	2	<b>T1, T2</b>	Chalk & Talk
32.	09/05/24	5	Back emf and its significance, torque equations	09/05/24	5	<b>T1, T2</b>	Chalk & Talk
33.	11/05/24	2	Types of motors, characteristics (shunt and series only), and applications.	11/05/24	2	<b>T1, T2</b>	Chalk & Talk
34.	13/05/24	1	Speed control (shunt and series only),	13/05/24	1	<b>T1, T2</b>	Chalk & Talk
35.	14/05/24	2	problems	14/05/24	2	<b>T1, T2</b>	Chalk & Talk
36.	16/05/24	5	problems	16/05/24	5	<b>T1, T2</b>	Chalk & Talk
37.	17/05/24	2	problems	17/05/24	2	<b>T1, T2</b>	Chalk & Talk
38.	20/05/24	2	<b>Module 4: Single Phase Transformers:</b> Necessity of transformer, Principle of operation.	20/05/24	2	<b>T2</b>	Chalk & Talk
39.	21/05/24	1	Types and construction of transformers.	21/05/24	1	<b>T2</b>	Chalk & Talk
40.	23/05/24	2	EMF equation, losses.	23/05/24	2	<b>T2</b>	Chalk & Talk
41.	24/05/24	5	Problems on emf equation	24/05/24	5	<b>T1, T2</b>	Chalk & Talk
42.	25/05/24	2	Variation of losses with respect to load, efficiency.	25/05/24	2	<b>T1, T2</b>	Chalk & Talk
43.	27/05/24	2	Condition for maximum efficiency.	27/05/24	2	<b>T1, T2</b>	Chalk & Talk
44.	28/05/24	1	problems	28/05/24	1	<b>T1, T2</b>	Chalk & Talk
45.	30/05/24	2	problems	30/05/24	2	<b>T1, T2</b>	Chalk & Talk
46.	31/05/24	5	problems	31/05/24	5	<b>T1, T2</b>	Chalk & Talk
47.	03/06/24	2	<b>Three Phase Induction Motors:</b> Principle of operation and concept of rotating magnetic field.	03/06/24	2	<b>T1, T2</b>	Chalk & Talk

48.	04/06/24	1	Construction and types of three-phase induction motor.	04/06/24	1	T1, T2	Chalk & Talk
49.	06/06/24	2	Working principle of three-phase induction motor.	06/06/24	2	T1, T2	Chalk & Talk
50.	07/06/24	5	Types – squirrel cage and wound rotor	07/06/24	5	T1, T2	Chalk & Talk
51.	08/06/24	2	Slip and its significance.	08/06/24	2	T1, T2	Chalk & Talk
52.	10/06/24	2	problems	10/06/24	2	T1, T2	Chalk & Talk
53.	11/06/24	1	problems	11/06/24	1	T1, T2	Chalk & Talk
54.	13/06/24	2	<b>Module 5: Domestic Wiring:</b> Requirements, Types of wiring: casing, capping. Two way & three way control	13/06/24	2	T1, T2	Chalk & Talk, PPT
55.	14/06/24	5	<b>Electricity bill:</b> Power rating of household appliances including air conditioners, PCs, laptops, printers, etc.	14/06/24	5	T1, T2	Chalk & Talk, PPT
56.	18/06/24	1	Definition of “unit” used for consumption electrical energy, two-part electricity tariff, Calculation of electricity bill for domestic consumers.	18/06/24	1	T1, T2	Chalk & Talk, PPT
57.	19/06/24	2	<b>Equipment Safety measures:</b> Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits	19/06/24	2	R2, R3	Chalk & Talk, PPT
58.	20/06/24	2	<b>Personal safety measures:</b> Earthing and its types	20/06/24	2	R2, R3	PPT
59.	21/06/24	5	Electric Shock, Safety precautions to avoid Shock.	21/06/24	5	R2, R3	PPT
60.	22/06/24	5	Problems on electricity bill	22/06/24	5	R2, R3	PPT
61.	28/06/24	5	VTU question discussion	28/06/24	5	R2, R3	PPT
62.	29/06/24	2	VTU question discussion	29/06/24	2	R2, R3	PPT

### Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	10/05/2024
2	Quiz	06/06/2024

#### **Text Books:**

**T1:** Basic Electrical Engineering, D C Kulshreshtha, TMH, Revised first edition.

**T2:** A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

**Reference Books:**


**R1:** Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019

**R2:** Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.

**R3:** Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3rd edition, 2014.



**Faculty**



Professor & Head EEE  
The Oxford College of Engg  
Bommanahalli, Hosur Road  
Bangalore-560 088

**HOD**

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**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Department of Electrical & Electronics Engineering**

**LESSON PLAN**

**Faculty Name: M.Raichel Ruby**

**Academic Year:2023 – 2024 (Even)**

**Sub Code &Name: BESCK204B & Introduction to Electrical Engineering**

**Year/Sem/Section:I<sup>st</sup>/II<sup>nd</sup>/C3&C4**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To explain the laws used in the analysis of DC and AC circuits.

CLO2. To explain the behavior of circuit elements in single-phase circuits..

CLO3. To explain the construction and operation of transformers, DC generators and motors and Induction motors.

CLO4. To introduce concepts of circuit protecting devices and earthing.

CLO5. To explain electric power generation, transmission and distribution, electricity billing, equipment and personal safety measures.

**COURSE OUTCOMES:**

<b>CO1</b>	Understand the concepts of various energy sources and Electric circuits
<b>CO2</b>	Apply the basic Electrical laws to solve circuits.
<b>CO3</b>	Discuss the construction and operation of various Electrical Machines.
<b>CO4</b>	Identify suitable Electrical machine for practical implementation
<b>CO5</b>	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/03/24	2	<b>Introduction to syllabus</b>	11/03/24	2	T1	Chalk & Talk ,PPT
2.	12/03/24	1	<b>Module1</b> Introduction: Conventional and non-	12/03/24	1	T1	Chalk &Talk ,PPT



			conventional energy resources; General structure of electrical power systems using single line diagram approach.				
3.	14/03/24	2	<b>Power Generation:</b> Hydel, Nuclear power generation (Block Diagram approach).	14/03/24	2	T1	Chalk & Talk ,PPT
4.	15/03/24	5	Solar & wind power generation (Block Diagram approach).	15/03/24	5	T1	Chalk & Talk ,PPT
5.	18/03/24	2	<b>D.C.Circuits:</b> Electric circuit, active and passive elements, dependent source and independent source, Ohm's Law and limitations	18/03/24	2	T1	Chalk & Talk ,PPT
6.	19/03/24	1	Analysis of Series, Parallel, & Series-Parallel circuits .	19/03/24	1	T1	Chalk & Talk
7.	21/03/24	2	problems	21/03/24	2	T1	Chalk & Talk
8.	22/03/24	5	problems	22/03/24	5	T1	Chalk & Talk
9.	23/03/24	2	Kirchhoff's voltage and current Law(KCL&KVL), power, energy	23/03/24	2	T1	Chalk & Talk
10.	25/03/24	2	problems	25/03/24	2	T1	Chalk & Talk
11.	26/03/24	1	Problems	26/03/24	1	T1	Chalk & Talk ,PPT
12.	28/03/24	2	<b>Module2 A.C. Fundamentals:</b> Equation of AC Voltage and current ,Definition of time period, frequency, amplitude, phase, phase difference.	28/03/24	2	T1	Chalk & Talk
13.	30/03/24	1	Average value, RMS value, form factor, peak factor	30/03/24	1	T1	Chalk & Talk ,
14.	01/04/24	2	Analysis of Resistive and inductive circuit with Phasor diagram	01/04/24	2	T1	Chalk & Talk
15.	02/04/24	1	Problems on resistive and inductive load	02/04/24	1	T1	Chalk & Talk
16.	04/04/24	2	Problems on resistive and inductive load	04/04/24	2	T1	Chalk & Talk
17.	05/04/24	5	Analysis of Capacitive circuit with Phasor diagram+problems	05/04/24	5	T1	Chalk & Talk
18.	08/04/24	2	Analysis of RL circuits with Phasor diagrams	08/04/24	2	T1	Chalk & Talk

19.	12/04/24	5	Analysis of RC circuits with Phasor diagrams	12/04/24	5	T1	Chalk & Talk
20.	13/04/24	1	Analysis of RLC circuits with Phasor diagrams	13/04/24	1	T1	Chalk & Talk
21.	15/04/24	2	Real power, Reactive power, Apparent Power and Power factor	15/04/24	2	T1	Chalk & Talk
22.	16/04/24	1	Problems on series circuits	16/04/24	1	T1	Chalk & Talk
23.	18/04/24	2	Problems on series circuits	18/04/24	2	T1	Chalk & Talk
24.	19/04/24	5	<b>Three Phase circuits:</b> Generation of 3 phase power, Advantages and limitations of 3-phase power.	19/04/24	5	T1	Chalk & Talk ,PPT
25.	22/04/24	2	Voltage and current relations in star and delta connections.	22/04/24	2	T1	Chalk & Talk ,PPT
26.	23/04/24	1	<b>Module 3: DC Machines:</b> <b>DC Generator:</b> Principle of operation, constructional detail	23/04/24	1	T1	Chalk & Talk ,PPT
27.	25/04/24	2	Induced emf expression, Types generators	25/04/24	2	T1	Chalk & Talk ,PPT
28.	26/04/24	5	The relation between induced emf and terminal voltage and problems	26/04/24	5	T1	Problem Based Learning
29.	27/04/24	2	problems	27/04/24	2	T1	Chalk & Talk ,PPT
30.	06/05/24	1	problems	06/05/24	1	T1	Chalk & Talk ,PPT
31.	07/05/24	2	problems	07/05/24	2	T1	Chalk & Talk ,PPT
32.	09/05/24	5	<b>DC Motor:</b> Principle of operation	09/05/24	5	T1	Chalk & Talk ,PPT
33.	11/05/24	2	Back emf and its significance, torque equations	11/05/24	2	T1	Chalk & Talk ,PPT
34.	13/05/24	1	Types of motors, characteristics (shunt and series only), and applications.	13/05/24	1	T1	Chalk & Talk ,PPT
35.	14/05/24	2	Speed control (shunt and series only),	14/05/24	2	T1	Chalk & Talk ,PPT
36.	16/05/24	5	problems	16/05/24	5	T1	Chalk & Talk ,PPT
37.	17/05/24	2	problems	17/05/24	2	T1	Chalk & Talk ,PPT
38.	20/05/24	2	problems	20/05/24	2	T1	Chalk & Talk ,PPT
39.	21/05/24	1	<b>Module 4: Single Phase</b>	21/05/24	1	T2	Chalk &

			<b>Transformers:</b> Necessity of transformer, Principle of operation.				Talk ,PPT
40.	23/05/24	2	Types and construction of transformers.	23/05/24	2	T2	Chalk & Talk ,PPT
41.	24/05/24	5	EMF equation, losses.	24/05/24	5	T2	Chalk & Talk ,PPT
42.	25/05/24	2	Problems on emf equation	25/05/24	2	T2	Chalk & Talk ,PPT
43.	27/05/24	2	Variation of losses with respect to load, efficiency.	27/05/24	2	T2	Chalk & Talk ,PPT
44.	28/05/24	1	Condition for maximum efficiency.	28/05/24	1	T2	Chalk & Talk ,PPT
45.	30/05/24	2	problems	30/05/24	2	T2	Chalk & Talk ,PPT
46.	31/05/24	5	problems	31/05/24	5	T2	Chalk & Talk ,PPT
47.	03/06/24	2	<b>Introduction to syllabus</b>	03/06/24	2	T2	Chalk & Talk ,PPT
48.	04/06/24	1	<b>Module1</b> Introduction: Conventional and non-conventional energy resources; General structure of electrical power systems using single line diagram approach.	04/06/24	1	T2	Chalk & Talk ,PPT
49.	06/06/24	2	problems	06/06/24	2	T1	Chalk & Talk ,PPT
50.	07/06/24	5	<b>Three Phase Induction Motors:</b> Principle of operation and concept of rotating magnetic field.	07/06/24	5	T1	Chalk & Talk ,PPT
51.	08/06/24	2	Construction and types of three-phase induction motor.	08/06/24	2	T1	Chalk & Talk ,PPT
52.	10/06/24	2	Working principle of three-phase induction motor.	10/06/24	2	T1	Chalk & Talk ,PPT
53.	11/06/24	1	Types – squirrel cage and wound rotor	11/06/24	1	T1	Chalk & Talk ,PPT
54.	13/06/24	2	Slip and its significance.	13/06/24	2	T1	Chalk & Talk
55.	14/06/24	5	problems	14/06/24	5	T1	Chalk & Talk
56.	18/06/24	1	problems	18/06/24	1	T1	Chalk & Talk
57.	19/06/24	2	<b>Module 5: Domestic Wiring:</b> Requirements, Types of wiring: casing, capping. Two way and three way control of load.	19/06/24	2	T1	PPT
58.	20/06/24	2	<b>Electricity bill:</b> Power	20/06/24	2	T1	PPT

			rating of household appliances including air conditioners, PCs, laptops, printers, etc.				
59.	21/06/24	5	Definition of “unit” used for consumption of electrical energy, two-part electricity tariff, Calculation of electricity bill for domestic consumers.	21/06/24	5	T1	PPT
60.	22/06/24	5	<b>Equipment Safety measures:</b> Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits	22/06/24	5	T1	PPT
61.	28/06/24	5	<b>Personal safety measures:</b> Earthing and its types	28/06/24	5	T1	PPT
62.	29/06/24	2	Electric Shock, Safety precautions to avoid Shock. bill	29/06/24	2	T1	PPT

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	10/05/2024
2	Online Quizzes	14/06/2024

### Text Books:

1. Basic Electrical Engineering”, D C Kulshreshtha, TMH, Revised first edition.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

**Reference Books:**

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015
3. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3rd edition, 2014.

R. C. Prasad

**Faculty**

V. K. Mehta  
Professor & Head EEE  
The Oxford College of Engg  
Dommanahalli, Hosur Road  
Bangalore - 560 080

**HOD**

IOA





**THE OXFORD COLLEGE OF ENGINEERING**  
**HOSUR ROAD, BOMMANAHALLI, BANGALORE - 68**  
**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**

Lesson Plan

Date: 12/02/2022

Subject code : 18CS81  
 Subject Title : INTERNET OF THINGS TECHNOLOGY  
 Course / Branch : BE/ ISE  
 Semester : VIII  
 Academic Year : 2022-24  
 Faculty Name : Ms. BAIRAVI S M

Unit	Topic No.	Date	Topic	Books Referred & Pages
I	1	12/2/24	<b>MODULE: I</b> What is IoT, Genesis of IoT	T1:
	2	12/2/24	IoT and Digitization ,IoT Impact	T1:6-23
	3	12/2/24	Convergence of IT and IoT ,IoT Challenges	T1:6-23
	4	16/2/24	IoT Network Architecture and Design	T1:24
	5	16/2/24	Drivers Behind New Network Architectures	T1:44
	6	23/2/24	Comparing IoT Architectures	T1:44
	7	23/2/24	A Simplified IoT Architecture	T1:72
	8	24/3/24	The Core IoT Functional Stack	T1:102
	9	24/3/24	IoT Data Management and Compute Stack.	T1:102
	10	24/3/24	IoT Data Management and Compute Stack.	T1:102
II	11	1/3/24	<b>MODULE: II Smart Objects: The "Things" in IoT</b>	T1:170
	12	1/3/24	Sensors, Actuators	T1:170
	13	1/3/24	Smart Objects	T1:203
	14	1/3/24	Sensor Networks	T1:213
	15	1/3/24	Connecting Smart Objects - Communications Criteria	T1:216
	16	1/3/24	Communications Criteria	T1:220
	17	8/3/24	IoT Access Technologies-IEEE 802.15.4	T1:228
	18	8/3/24	IoT Access Technologies- IEEE 802.15.4g & IEEE 802.15.4e	T1:231
	19	9/3/24	IoT Access Technologies IEEE 1901.2a & IEEE 802.11ah	T1:235
	20	9/3/24	IoT Access Technologies LoRaWAN & NB-IoT other LTE variations	T1:235
III	21	22/3/24	<b>MODULE: III</b> <b>IoT Network Layer – Introduction</b>	T1:242
			The Business Case for IP	T1:243
	22	22/3/24	The need for Optimization	T1:243
	23	22/3/24	Optimizing IP for IoT	T1:252
	24	22/3/24	Optimizing IP for IoT	T1:262
	25	23/3/24	Optimizing IP for IoT	T1:308
	26	23/3/24	Profiles and Compliances	T1:310
	27	23/3/24	<b>Application Protocols for IoT: The Transport Layer</b>	T1:313
	28	23/3/24	IoT Application Transport Methods	T1:324
	29	30/3/24	IoT Application Transport Methods	T1:372
IV	30	30/3/24	IoT Application Transport Methods	T1:391
	31	30/3/24	<b>MODULE: IV: Data and Analytics for IoT</b> An Introduction to Data Analytics for IoT	T1:393
	32	30/3/24	Machine Learning	T1:396
	33	30/3/24	Big Data Analytics Tools and Technology	T1:407
	34	30/3/24	Edge Streaming Analytics	T1:418
	35	30/3/24	Network Analytics	T1:422
	36	5/4/24	<b>Securing IoT: A Brief History of OT Security</b>	T1:423
	37	5/4/24	Common Challenges in OT Security	T1:492
	38	5/4/24	Common Challenges in OT Security	T1:499
	39	1/4/24	How IT and OT Security Practices and Systems Vary	T1:510
40	6/4/24	Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment	T1:514	
	41	6/4/24	<b>MODULE: V IoT Physical Devices and Endpoints –</b> Arduino UNO: Introduction to Arduino, Arduino UNO,	T1:515
	42	6/4/24	Installing the Software, Fundamentals of Arduino Programming.	T1:516
	43	12/4/24	IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi,	T1:526
	44	12/4/24	About the RaspberryPi Board: Hardware Layout,	T1:745
	45	13/4/24	Operating Systems on RaspberryPi, Configuring RaspberryPi,	



V	46	13/4/24	Programming RaspberryPi with Python	T1:745
	47	13/4/24	Wireless Temperature Monitoring System Using Pi. DS18B20 Temperature Sensor	T1:700
	48	19/4/24	Connecting Raspberry Pi via SSH, Accessing Temperature from DS18B20 sensors Remote access to RaspberryPi	T1:700
	49	26/4/24	Smart and Connected Cities, An IoT Strategy for Smarter Cities, Smart City IoT Architecture.	T1:708
	50	27/4/24	Smart City Security Architecture, Smart City Use-Case Examples.	T1:756
	51	3/5/24	Revision -1	
	52	9/5/24	Revision -2	

**TEXT BOOKS:**

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry, "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", 1st Edition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)

2. Srinivasa K G, "Internet of Things", CENGAGE Learning India, 2017


**REFERENCE BOOKS:**

1. Vijay Madiseti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014. (ISBN: 978-8173719547)

2. Raj Kamal, "Internet of Things: Architecture and Design Principles", 1st Edition, McGraw Hill Education, 2017. (ISBN: 978-9352605224)



Faculty



HOD



**CHILDREN'S EDUCATION SOCIETY (REGD.)**  
Administrative Office:  
1st Phase JP Nagar, Bengaluru – 560 078  
☎: 080-3041 0501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

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UGC Under Section 2(f), Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -30219601/602, Fax: 080 – 25730551/ 30219629 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxford.edu](http://www.theoxford.edu)

### Lesson Plan

Date:19.09.2023

Name : C A BINDYASHREE  
Subject code : 18CS744  
Subject Title : CRYPTOGRAPHY  
Course / Branch : B.E/ CSE  
Semester : VII – A sec

**Objective of Course:** Students should be able to:

- Define cryptography and its principles.
- Explain Cryptography algorithms.
- Illustrate Public and Private key cryptography.
- Explain Key management, distribution and certification.
- Explain authentication protocols.
- Tell about IPSec.

**PREREQUISITES:** A basic knowledge of Security, encryption and decryption.

Unit	Date	Topic No.	Topic	Books Referred & Pages
I	20/9/23	1.	Classical Encryption Techniques	T1: 28 - 30
	22/9/23	2.	Symmetric Cipher Model, Cryptography, Cryptanalysis and Brute-Force Attack,	T1: 30 - 34
	23/9/23	3.	Substitution Techniques, Caesar Cipher	T1:35 - 40
	25/9/23	4.	Monoalphabetic Cipher, Playfair Cipher, Hill Cipher, Polyalphabetic Cipher, One Time Pad.	T1:40 - 49
	26/9/23	5.	Block Ciphers and the data encryption standard: Traditional block Cipher structure, stream	T1: 62 - 64
	27/9/23	5.	Ciphers and block Ciphers, Motivation for the feistel Cipher	T1: 65 - 71

			structure, the feistel Cipher,	
	29/9/23	6.	The data encryption standard, DES encryption, DES decryption, A DES example, results, the avalanche effect	T1: 72-75
	3/9/23	7	The strength of DES, the use of 56-Bit Keys, the nature of the DES algorithm, timing attacks	T1: 82 - 85
	4/9/23	8	Block cipher design principles, number of rounds	T1:86 - 87
	6/10/23	9	Design of function F	T1:87–88
	9/10/23	10.	Key schedule algorithm.	T1:89 - 90
II	10/10/23		<b>Public-Key Cryptography and RSA:</b>	
		11.	Principles of public-key cryptosystems. Public-key cryptosystems.	T1: 257 - 259
	11/10/23	12.	Applications for public-key cryptosystems, requirements for public-key cryptosystems.	T1: 260 – 264
	13/10/23	13	Public-key cryptanalysis. The RSA algorithm, description of the algorithm,	T1:268 – 273
	14/10/23	14	Computational aspects, the security of RSA.	T1:274 - 280
	20/10/23	15.	Other Public-Key Cryptosystems: Diffie-Hellman key exchange,	T1: 289 – 290
	25/10/23	16	The algorithm	T1:298
	27/10/23	17.	Key exchange protocols,	T1: 299
	28/10/23	18.	Man in the middle attack,	T1: 300
	30/10/23	19	Elgamal Cryptographic system	T1: 300
	30/10/23	20.	Elgamal Cryptographic system	T1: 300
III	3/11/23		<b>Key Management- Introduction</b>	
		21.	Elliptic curve arithmetic, abelian groups,	T1:301- 303
	6/11/23	22.	Elliptic curves over real numbers, elliptic curves over $Z_p$ , elliptic curves over $GF(2^m)$ ,	T1:304 -309
	7/11/23	23.	Elliptic curve cryptography, Analog of Diffie-Hellman key exchange, Elliptic curve encryption/ decryption,	T1:310 – 311

	8/11/23	24.	Security of Elliptic curve cryptography, Pseudorandom number generation based on an asymmetric cipher,	T1:312 - 314
	10/11/23	25.	PRNG based on RSA. Key Management and Distribution: Symmetric key distribution using Symmetric encryption,	T1:401- 405
	13/11/23	26.	A key distribution scenario, Hierarchical key control, session key lifetime, a transparent key control scheme,	T1: 406 – 409
	15/11/23	27	Decentralized key control, controlling key usage, Symmetric key distribution using asymmetric encryption,	T1: 410 – 415
	17/11/23	28	Simple secret key distribution, secret key distribution with confidentiality and authentication,	T1: 416 – 419
	24/11/23	29	A hybrid scheme, distribution of public keys, public announcement of public keys,	T1: 420 – 422
	25/11/23	30.	Publicly available directory, public key	T1: 423 - 427
IV	27/11/23		<b>Authentication Applications:</b>	
		31.	X-509 certificates. Certificates, X-509 version 3	T1: 419 - 422
	28/11/23	32.	Public key infrastructure. User Authentication: Remote user Authentication principles	T1: 428 - 429
	29/11/23	33.	Mutual Authentication, one way Authentication, remote user Authentication using Symmetric encryption	T1: 436 – 437
IV	1/12/23	34.	Mutual Authentication, one way Authentication, Kerberos, Motivation, Kerberos version 4, Kerberos version 5	T1: 438 – 440
	4/12/23	35	Remote user Authentication using Asymmetric encryption, Mutual Authentication	T1:441 – 443
	5/12/23	36	One way Authentication. Electronic	T1: 444 – 450



			Mail Security: Pretty good privacy, notation, operational; description, S/MIME	
	6/12/23	37	RFC5322, Multipurpose internet mail extensions, S/MIME functionality	T1: 450 – 457
	8/12/23	38.	S/MIME messages, S/MIME certificate processing, enhanced security services	T1: 458 – 460
	9/12/23	39	Domain keys identified mail, internet mail architecture	T1: 461 – 464
	11/12/23	40	E-Mail threats, DKIM strategy, DKIM functional flow	T1: 621 – 623
	12/12/23	41	IP Security: IP Security overview	T1: 624 - 626
	13/12/23	42	Applications of IPsec, benefits of IPsec	T1: 627 - 630
	15/12/23	<b>43</b>	Routing applications, IPsec documents, IPsec services, transport and tunnel modes	T1: 631 - 632
<b>V</b>	18/12/23	44	IP Security policy, Security associations, Security associations database	<b>T1: 633 – 634</b>
	19/12/23	45	Security policy database, IP traffic processing, Encapsulating Security payload	T1: 635 – 636
	20/12/23	46	ESP format, encryption and authentication algorithms	T1: 637 – 638
	22/12/23	47	Padding, Anti replay service Transport and tunnel modes	T1: 639 – 640
	23/12/23	48	Combining security associations, authentication plus confidentiality	T1: 641 – 642
	26/12/23	49	Basic combinations of security associations	T1: 643
	30/12/23	50	Internet key exchange, key determinations protocol	T1: 644
	1/1/24	50	Header and payload formats, cryptographic suits	T1: 655
	2/1/24	51	Revision -Module 1,2&3	

	3/1/24	52	Revision -Module 4&5	
	5/1/24	53	Discussion on University QP's	

**Course Outcomes: After studying this course, students will be able to:**

- 1.Explain basic cryptographic algorithms to encrypt and decrypt the data.
2. Use symmetric and asymmetric cryptography algorithms to encrypt and decrypt the information.
3. Describe the mathematics associated with cryptography.
4. Apply concepts of modern algebra in cryptography algorithms.
5. Apply pseudo random sequence in stream cipher algorithms.
6. Explain authentication protocols and Tell about IPsec.

  
**Faculty**

  
**HOD(ISE)**

**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

**THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)**Department of Information Science & Engineering****LESSON PLAN****Faculty Name:S.Visalini****Academic Year:2023-24(Even)****SUB.CODE&Name: SOFTWARE TESTING(21IS63)****Year/Sem/Section:III/VI/B****COURSE OBJECTIVES** This course will enable the students to

CLO1. . Explain different testing techniques.

CLO 2. Differentiate the various testing techniques.

CLO 3. Apply suitable technique for designing of flow graph.

CLO 4. Analyze the problem and derive suitable test cases.

**COURSE OUTCOMES:**

<b>CO1</b>	Explain the significance of software testing and quality assurance in software development
<b>CO2</b>	Apply the concepts of software testing to assess the most appropriate testing method.
<b>CO3</b>	Analyze the importance of testing in software development.
<b>CO4</b>	Evaluate the suitable testing model to derive test cases for any given software
<b>CO5</b>	Develop appropriate document for the software artefact.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Refer ence Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/4/24	2 <sup>nd</sup> /9.55- 10.50AM	Basics of Software Testing: Humans, Errors and Testing	29/4/24	2 <sup>nd</sup> /9.55- 10.50AM	<b>T2:1-8</b> Ch. 1.1	Chalk and talk method/PPT
2.	30/4/24	3 <sup>rd</sup> /11:00- 11:55 AM	Software Quality, Requirements Behavior and Correctness,	30/4/24	3 <sup>rd</sup> /11:00- 11:55 AM	<b>T2:8- 13</b> Ch. 1.2,1.3	Chalk and talk method/PPT
3.	2/5/24	1 <sup>st</sup> /9.00- 9.55AM	Correctness versus Reliability	2/5/24	1 <sup>st</sup> /9.00- 9.55AM	<b>T2:15- 16</b>	Chalk and talk method/PPT

						<b>Ch1.4</b>	
4.	6/5/24	2 <sup>nd</sup> /9.55-10.50AM	Testing and Debugging	6/5/24	2 <sup>nd</sup> /9.55-10.50AM	<b>T2:17-26</b>	Chalk and talk method/PPT
5.	7/5/24	3rd/11:00-11:55 AM	Test Metrics	7/5/24	3rd/11:00-11:55 AM	<b>T2:27-33</b>	Chalk and talk method/PPT
6.	8/5/24	1st/9.00-9.55AM	Testing and Verification, Test-generation Strategies, Static Testing	8/5/24	1st/9.00-9.55AM	<b>T2:36, 39,41-44</b>	Chalk and talk method/PPT
7.	9/5/24	1st/9.00-9.55AM	Test cases, Insights from a Venn diagram	9/5/24	1st/9.00-9.55AM	T1:5-7 R1:42-46	Chalk and talk method/PPT
8.	13/5/24	2 <sup>nd</sup> /9.55-10.50AM	Identifying test cases:i)Functional Testing, Structural Testing,ii)The Functional vs Structural debate, iii)Test-generation Strategies,	13/5/24	2 <sup>nd</sup> /9.55-10.50AM	T1:7-9 T3:39-41	Chalk and talk method/PPT
9.	14/5/24	3rd/11:00-11:55 AM	Test Metrics, Error and fault taxonomies ,	14/5/24	3rd/11:00-11:55 AM	T3:27-33 T1:10-12	Chalk and talk method/PPT
10.	15/5/24	1st/9.00-9.55AM	Levels of testing, Testing and Verification, Static Testing.	15/5/24	1st/9.00-9.55AM	T3:41-44	Chalk and talk method/PPT
11.	16/5/24	1st/9.00-9.55AM	<b>Problem Statements:</b> The Triangle problem, the Next Date function Generalized pseudo code,	16/5/24	1st/9.00-9.55AM	T1:15-19	Chalk and talk method/Project based Learning
12.	20/5/24	2 <sup>nd</sup> /9.55-10.50AM	The commission problem, the SATM (Simple Automatic Teller Machine) problem,	20/5/24	2 <sup>nd</sup> /9.55-10.50AM	T1:26-30	Chalk and talk method/PPT
13.	21/5/24	3rd/11:00-11:55 AM	The currency converter, Saturn windshield wiper	21/5/24	3rd/11:00-11:55 AM	T1:30-32	Chalk and talk method/PPT
14.	22/5/24	1st/9.00-9.55AM	<b>Module 2:Functional Testing:</b> Boundary value analysis,	22/5/24	1st/9.00-9.55AM	T1:75-77	Chalk and talk method/PPT
15.	23/5/24	1st/9.00-9.55AM	Robustness testing, Worst-case testing,	23/5/24	1st/9.00-9.55AM	T1:78-79	Chalk and talk method/PPT
16.	25/5/24	2 <sup>nd</sup> /9.55-10.50AM	Robust Worst testing for triangle problem,	25/5/24	2 <sup>nd</sup> /9.55-10.50AM	T1:81	Chalk and talk method/PPT
17.	27/5/24	2 <sup>nd</sup> /9.55-10.50AM	Next date problem and commission problem,	27/5/24	2 <sup>nd</sup> /9.55-10.50AM	T1:82-85	Chalk and talk method/PPT
18.	28/5/24	3rd/11:00-11:55 AM	<b>Equivalence classes:</b> i) Equivalence test cases for the triangle problem,	28/5/24	3rd/11:00-11:55 AM	T1:89-95 R3:42-49	Chalk and talk method/PPT
19.	29/5/24	1st/9.00-	Next Date function, and the	29/5/24	1st/9.00-	T1:10	Chalk and talk

		<b>9.55AM</b>	commission problem		<b>9.55AM</b>	9-114	method/PPT
20.	30/5/24	<b>1st/9.00-9.55AM</b>	<b>Decision tables:</b> Test cases for the triangle problem, NextDate function, and the commission problem	30/5/24	<b>1st/9.00-9.55AM</b>	T1:10 3-108 R3:36-38	Chalk and talk method/PPT
21.	8/6/24	<b>3rd/11:00-11:55 AM</b>	Guidelines and observations.	8/6/24	<b>3rd/11:00-11:55 AM</b>	T1:11 4-115	Chalk and talk method/PPT
22.	10/6/24	<b>2nd/9.55-10.50AM</b>	<b>Module 3:</b> Structural Testing: Overview, Statement testing,	10/6/24	<b>2nd/9.55-10.50AM</b>	T2:21 1-215	Chalk and talk method/PPT
23.	11/6/24	<b>3rd/11:00-11:55 AM</b>	Branch testing, Condition testing	11/6/24	<b>3rd/11:00-11:55 AM</b>	T2:21 7-219	Chalk and talk method/PPT
24.	12/6/24	<b>1st/9.00-9.55AM</b>	Path testing: i)DD paths, ii)Test coverage metrics, iii)Metric based testing test coverage analyzers,	12/6/24	<b>1st/9.00-9.55AM</b>	T2:22 2-228	Chalk and talk method/PPT
25.	13/6/24	<b>1st/9.00-9.55AM</b>	Basis path testing: i)McCabe's basis path method ii)Essential complexity, guidelines and observations,	13/6/24	<b>1st/9.00-9.55AM</b>	T1:13 9-147	Chalk and talk method/PPT
26.	18/6/24	<b>3rd/11:00-11:55 AM</b>	Data –Flow testing: Definition-Use testing: i)du-paths for stocks, ii)du-paths for locks, iii)du-paths for total locks, iv)du-paths for sales, v)du-paths for commission, vi)Test coverage metrics.	18/6/24	<b>3rd/11:00-11:55 AM</b>	T2:23 5-236	Chalk and talk method/PPT
27.	19/6/24	<b>1st/9.00-9.55AM</b>	Slice Based Testing: i)Style and technique, ii) Guidelines and observations.	19/6/24	<b>1st/9.00-9.55AM</b>	T1:16 1-167	Chalk and talk method/PPT
28.	20/6/24	<b>1st/9.00-9.55AM</b>	Levels of Testing, Integration Testing: Traditional view of testing levels, Alternative life-cycle models	20/6/24	<b>1st/9.00-9.55AM</b>	T1:18 1-185	Chalk and talk method/PPT
29.	22/6/24	<b>1st/9.00-9.55AM</b>	The SATM system, Separating integration and system testing	22/6/24	<b>1st/9.00-9.55AM</b>	T1:18 6-199	Chalk and talk method/PPT
30.	24/6/24	<b>2nd/9.55-10.50AM</b>	A closer look at the SATM system, Decomposition-based integration: i)Top down Integration, ii) Bottom up Integration iii)Sandwich Integration.	24/6/24	<b>2nd/9.55-10.50AM</b>	T1:20 3-208	Chalk and talk method/PPT



31.	<b>25/6/24</b>	<b>3rd/11:00-11:55 AM</b>	Call graph-based: i)Pair wise Integration and ii)Neighborhood Integration, Path-based integrations: i)New and Extended concepts, ii) MM Paths in the SATM System iii) MM Path Complexity.	<b>25/6/24</b>	<b>3rd/11:00-11:55 AM</b>	T1:20 9-220	Chalk and talk method/PPT
32.	<b>26/6/24</b>	<b>1st/9.00-9.55AM</b>	Levels of Testing: Traditional view of testing levels	<b>26/6/24</b>	<b>1st/9.00-9.55AM</b>	T1:18 1-183	Chalk and talk method/PPT
33.	<b>27/6/24</b>	<b>1st/9.00-9.55AM</b>	Alternative life-cycle models,	<b>27/6/24</b>	<b>1st/9.00-9.55AM</b>	T1:18 3-186	Chalk and talk method/PPT
34.	<b>29/6/24</b>	<b>1st/9.00-9.55AM</b>	The SATM system, Separating integration and system testing.	<b>29/6/24</b>	<b>1st/9.00-9.55AM</b>	T1:18 6-199	Chalk and talk method/PPT
35.	<b>1/7/24</b>	<b>2nd/9.55-10.50AM</b>	The SATM system, Separating integration and system testing.	<b>1/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:18 6-199	Chalk and talk method/PPT
36.	<b>2/7/24</b>	<b>3rd/11:00-11:55 AM</b>	Integration Testing: A closer look at the SATM system	<b>2/7/24</b>	<b>3rd/11:00-11:55 AM</b>	T1:20 1-205	Chalk and talk method/PPT
37.	<b>8/7/24</b>	<b>2nd/9.55-10.50AM</b>	Decomposition-based, call graph-based, Path based integrations.	<b>8/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:20 5-221	Chalk and talk method/PPT
38.	<b>9/7/24</b>	<b>3rd/11:00-11:55 AM</b>	call graph-based	<b>9/7/24</b>	<b>3rd/11:00-11:55 AM</b>	T1:20 9-212	Chalk and talk method/PPT
39.	<b>10/7/24</b>	<b>1st/9.00-9.55AM</b>	Path based integrations	<b>10/7/24</b>	<b>1st/9.00-9.55AM</b>	T1:21 2-221	Chalk and talk method/PPT
40.	<b>11/7/24</b>	<b>1st/9.00-9.55AM</b>	Revision	<b>11/7/24</b>	<b>1st/9.00-9.55AM</b>		Chalk and talk method/PPT
41.	<b>13/7/24</b>	<b>2nd/9.55-10.50AM</b>	Module 5: System Testing: Threads,	<b>13/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:22 9-232	Chalk and talk method/PPT
42.	<b>15/7/24</b>	<b>2nd/9.55-10.50AM</b>	Requirement Specification,	<b>15/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:23 3-236	Chalk and talk method/PPT
43.	<b>15/7/24</b>	<b>2nd/9.55-10.50AM</b>	Finding Threads	<b>15/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:23 7-240	Chalk and talk method/PPT
44.	<b>16/7/24</b>	<b>3rd/11:00-11:55 AM</b>	Structural strategies for thread testing,	<b>16/7/24</b>	<b>3rd/11:00-11:55 AM</b>	T1:24 0-244	Chalk and talk method/PPT
45.	<b>18/7/24</b>	<b>1st/9.00-9.55AM</b>	SATM test threads	<b>18/7/24</b>	<b>1st/9.00-9.55AM</b>	T1:24 8-252	Chalk and talk method/PPT
46.	<b>18/7/24</b>	<b>1st/9.00-9.55AM</b>	System testing guidelines,	<b>18/7/24</b>	<b>1st/9.00-9.55AM</b>	T1:25 3-256	Chalk and talk method/PPT
47.	<b>22/7/24</b>	<b>2nd/9.55</b>	ASF testing example.	<b>22/7/24</b>	<b>2nd/9.55</b>	T1:25 7-259	Chalk and talk method/PPT
48.	<b>22/7/24</b>	<b>2nd/9.55</b>	Interaction Testing: Context of interaction	<b>22/7/24</b>	<b>2nd/9.55</b>	T1:26 1-263	Chalk and talk method/PPT

49.	23/7/24	3rd/11:00	A taxonomy of interactions, Interaction, composition, and determinism	23/7/24	3rd/11:00	T1:26 3-277	Chalk and talk method/PPT
50.	23/7/24	3rd/11:00	Client/Server Testing	23/7/24	3rd/11:00	T1:28 0-282	Chalk and talk method/PPT

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list(i)	31/5/24
2	CCE-2 from the above list(v)	2/7/24

#### Text Books:

1. Paul C. Jorgensen: Software Testing, A Craftsman"s Approach, 3rd Edition, Auerbach Publications, 2008
2. Aditya P Mathur: Foundations of Software Testing, Pearson Education, 2008.

#### Reference Book:

1. Mauro Pezze, Michal Young: Software Testing and Analysis – Process, Principles and Techniques, Wiley India, 2009.
2. Software testing Principles and Practices – Gopaldaswamy Ramesh, Srinivasan Desikan, 2 nd Edition, Pearson, 2007.
3. Software Testing – Ron Patton, 2nd edition, Pearson Education, 2004.
4. The Craft of Software Testing – Brian Marrick, Pearson Education, 1995.
5. Anirban Basu, Software Quality Assurance, Testing and Metrics, PHI, 2015.

  
Faculty

  
HOD(ISE)



**THE OXFORD COLLEGE OF ENGINEERING**  
**HOSUR ROAD, BOMMANAHALLI, BANGALORE - 68**  
**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**  
**Lesson Plan**

**Date:**

**Subject code** : 17CS53  
**Subject Title** : DATA BASE MANAGEMENT SYSTEMS  
**Course / Branch** : B.E/ Information science and Engineering  
**Semester** : V-A  
**Academic Year** : 2023-24 (Odd Semester)  
**Faculty Name** : Abidha T E

**Course Objective:**

- Provide a strong foundation in database concepts, technology, and practice.
- Practice SQL programming through a variety of database problems.
- Demonstrate the use of concurrency and transactions in database
- Design and build database applications for real world problems.

**Course Outcome:** Students will be able to

- Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
- Design and build GUI application to interact with databases.
- Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
- Master sound design principles for logical design of databases, including the E-R method and normalization approach
- Master the basics of query evaluation techniques and query optimization.
- Be familiar with the basic issues of transaction processing and concurrency control.

**PREREQUISITES:** Knowledge of requirements data, information and management.

Module	Topic No.	Date	Topic	Books Referred & Pages
I	1.	27/11/23	<b>Introduction to Databases:</b> i)Introduction ii)Characteristics of database approach	<b>T1:1.1 - 1.3</b>
	2.	28/11/23	<b>Advantages of using the DBMS approach</b> i)Controlling Redundancy ii)Restricting unauthorized access iii)Backup & Recovery iv) Multiple user interfaces v)Integrity constraints, <b>History of database applications</b> i)Hierarchical & Network systems ii)Relational DB iii)Complex DB	<b>T1:1.6,1.7</b>
	3.	28/11/23	<b>Overview of Database Languages and Architectures:</b> i)Data Models,	<b>T1:2.1</b>
	4.	04/12/23	<b>Schemas and Instances</b> i)Three schema architecture ii) Data independence,	<b>T1:2.2</b>

	5.	05/12/23	<b>Languages and interfaces :</b> i)DBMS Languages ii)DBMS Interfaces <b>The Database System environment</b> i)DBMS component modules ii)DB system utilities iii)Tools & Applications	<b>T1:2.3</b>
	6.	04/12/23	<b>Conceptual Data Modeling using Entities and Relationships:</b> i) Entity types	<b>T1:3.3</b>
	7.	07/12/23	<b>Conceptual Data Modeling using Entities and Relationships:</b> ii)Entity sets iii)Attributes iv) Roles v)structural constraints	<b>T1:3.3,3.4</b>
	8.	09/12/23	<b>Weak entity types</b> i)ER diagrams	<b>T1:3.5,3.6</b>
	9.	11/12/23	<b>Conceptual Data Modeling examples</b> i)Conceptual Design ii)Physical Design iii)Logical design	<b>T1:3.8</b>
	10.	12/12/23	i)Specialization ii) Generalization.	<b>T1:4.2</b>
<b>II</b>	11.	12/12/23	<b>Relational Model: Relational Model Concept</b> i)Domains, Attributes, tuples & Relations ii)Characteristics of Relation iii)Relational Model Notation	<b>T1:5.1</b>
	12.	14/12/23	<b>Relational Model Constraints and relational database schemas</b> i)Domain Constraints ii)Key constraints iii)Relational DB schema iii)Integrity	<b>T1:5.2</b>
	13.	18/12/23	<b>Update operations, transactions, and dealing with constraint violations</b> i)Insert operation ii)Delete operation iii)Update operation iv)Transaction concept	<b>T1:5.3</b>
	14.	19/12/23	<b>Relational Algebra: i)</b> Unary relational operations ii) Binary relational operations.	<b>T1:6.1 - 6.3</b>
	15.	19/12/23	<b>Additional relational operations</b> i)Aggregate function ii)Grouping iii)Recursive closure operation	<b>T1:6.4</b>
	16.	21/12/23	Examples of Queries in relational algebra.	<b>T1:6.5</b>
	17.	23/12/23	<b>Mapping Conceptual Design into a Logical Design: i)</b> Relational Database Design using ER-to-Relational mapping.	<b>T1:7.1</b>
	18.	26/12/23	<b>SQL:i)</b> SQL data definition and data types ii)Specifying constraints in SQL	<b>T1:8.1</b>
	19.	26/12/23	<b>Retrieval queries in SQL</b> i)INSERT ii)DELETE iii) UPDATE statements in SQL.	<b>T1:8.6</b>
	20.	01/01/24	<b>Additional features of SQL.</b> i) Grant & Revoke	<b>T1:8.9</b>
	21.	02/01/24	<b>SQL : Advances Queries: i)</b> More complex SQL retrieval queries ii)The Middle Tier	<b>T1:8.5</b>

III	22.	02/01/24	<b>Specifying constraints as assertions and action triggers</b> i)Assertion ii)Trigger	<b>T1:8.7</b>
	23.	04/01/24	<b>Views in SQL</b> i)Concepts ii)Specification iii)Implementations <b>Schema change statements in SQL.</b>	<b>T1:8.8</b>
	24.	08/01/24	<b>Database Application Development:</b> Accessing databases from applications,	<b>T2:6.1</b>
	25.	09/01/24	An introduction to JDBC, JDBC classes and interfaces,	<b>T2:6.2,6.3</b>
	26.	09/01/24	SQLJ, Stored procedures	<b>T2:6.4,6.5</b>
	27.	11/01/24	Case study: The internet Bookshop.	<b>T2:6.6</b>
	28.	13/01/24	<b>Internet Applications:</b> The three-Tier application architecture	<b>T2:7.5</b>
	29.	16/01/24	The presentation layer	<b>T2:7.6</b>
	30.	16/01/24	The Middle Tier	<b>T2:7.7</b>
IV	31.	18/01/24	<b>Normalization: Database Design Theory</b> i)Introduction to Normalization using Functional and Multivalued Dependencies ii)Informal design guidelines for relation schema	<b>T1:10.1</b>
	32.	22/01/24	<b>Functional Dependencies</b> i)Definition ii)Equivalence of sets iii)Minimal sets	<b>T1:10.2</b>
	33.	23/01/24	<b>Normal Forms based on Primary Keys:</b> i)Normalization of Relations ii)Practical use iii)Keys & Attributes iv)First NF <b>Second and Third Normal Forms:</b> i)Definiton of 2NF ii) Definiton of 3NF	<b>T1:10.3,10.4</b>
	34.	23/01/24	Boyce-Codd Normal Form	<b>T1:10.5</b>
	35.	25/01/24	<b>Multivalued Dependency and Fourth Normal Form:</b> i)Definition of MVD ii)Inference Rules iii)4NF iv)Nonadditive join Decomposition into 4NF	<b>T1:11.3</b>
	36.	01/02/24	Join Dependencies and Fifth Normal Form.	<b>T1:11.4</b>
	37.	05/02/24	<b>Normalization Algorithms:</b> i)Inference Rules ii)Equivalence iii)Minimal Cover	<b>T1:10.2,11.4</b>
	38.	06/02/24	<b>Properties of Relational Decompositions</b> i) Relational Decompositions ii)Dependency Preservation iii)Nonadditive <b>Algorithms for Relational Database Schema Design</b> i)Dependency Preservation ii)Nonadditive Join Decomposition	<b>T1:11.1</b>
	39.	06/02/24	i)Nulls ii)Dangling tuples iii)Alternate Relational Designs	<b>T1:11.2</b>



V	40.	08/02/24	Further discussion of Multivalued dependencies and 4NF <b>Other dependencies and Normal Forms</b> i)Template Dependencies ii)Arithmetic functions iii)Domain Key NF	<b>T1:11.3</b>
	41.	10/02/24	<b>Transaction Processing:</b> i)Introduction to Transaction Processing, ii)Transaction and System concepts	<b>T1:17.1,17.2</b>
	42.	12/02/24	<b>Desirable properties of Transactions</b> i)ACID Properties <b>Characterizing schedules based on recoverability</b> i)Schedules of transaction	<b>T1:17.3,17.4</b>
	43.	13/02/24	<b>Characterizing schedules based on Serializability</b> i)Serial & Nonserial schedule ii)uses <b>Transaction support in SQL</b> i)Dirty read ii)Nonrepeatable Read iii)Phantoms	<b>T1:17.5,17.6</b>
	44.	13/02/24	<b>Concurrency Control in Databases: Two-phase locking techniques for Concurrency control</b> i)types of Locks ii)Guaranteeing serializability	<b>T1:18.1</b>
	45.	15/02/24	<b>Concurrency control based on Timestamp ordering</b> i)Timestamps ii)Timestamp ordering algorithms	<b>T1:18.2</b>
	46.	19/02/24	<b>Multiversion Concurrency control techniques</b> i)Multiversion Technique based on timestamp ii)Multiversion 2phase locking <b>Validation Concurrency control techniques</b> i)Read phase ii)Validation phase iii)Write phase	<b>T1:18.3,18.4</b>
	47.	20/02/24	<b>Granularity of Data items and Multiple Granularity Locking</b> i)Granularity level consideration ii) Multiple Granularity Locking	<b>T1:18.5</b>
	48.	20/02/24	<b>Introduction to Database Recovery Protocols:</b> i)Recovery Concepts, ii)NO-UNDO/REDO recovery based on Deferred update	<b>T2:19.1,19.2</b>
	49.	22/02/24	<b>Recovery techniques based on immediate update</b> i)Undo/Redo recovery <b>Shadow paging</b>	<b>T2:19.3,19.4</b>
50.	24/02/24	Database backup and recovery from catastrophic failures	<b>T2:19.7</b>	
	51.	26/02/24	REVISION on MODULE 1 & 2	
	52.	27/02/24	REVISION on MODULE 3 & 4	
	53.	27/02/24	REVISION on MODULE 5	
	54.	29/02/24	VTU Question & Answers Discussion.	

### Self-study Topics (Out –of- Syllabus)

Sl. No.	Self –study Topics	Suggested Reference
1.	Example Database applications	R2 : 1-23
2.	ER to Relational mappings	R1 : 25-34

#### Assignment Topics

Sl. No.	Assignment Topics	Submission due on
1.	Create ER diagram for university database	
2.	Illustrate all the 5 normal forms with a sample database.	
3.	Mini project(Online applications)	

#### Home work Topics

Sl. No.	Homework Topics	Submission due on
1.	E-R diagrams	
2.	Simple and complex SQL queries	
3.	Normal forms	

#### Quiz / Class Test Topics:

Sl. No.	Topics	Submission due on
1.	MODULE 1, MODULE 2	
2.	MODULE 3, MODULE 4	
3.	MODULE 5.	

#### Students Feedback about the course from Last Year:

1. Difficulty in solving SQL queries.

#### Action Plan proposed to accommodate the Feedback:

1. Tutorial classes planned for solving more SQL queries.
2. For weak students more concentration on solving frequently asked questions from VTU Previous year question paper

#### Text Books:

1. Database systems Models, Languages, Design and Application Programming, Ramez Elmasri and Shamkant B. Navathe, 6th Edition, Pearson.
2. Database management systems, Ramakrishnan, and Gehrke, 3rd Edition, 2014, McGraw Hill

#### Reference Books:

1. Silberschatz Korth and Sudharshan: Database System Concepts, 6th Edition, Mc-Graw Hill, 2013.
2. Coronel, Morris, and Rob, Database Principles Fundamentals of Design, Implementation and Management, Cengage Learning 2012.



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**CHILDREN'S EDUCATION SOCIETY (Regd.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### **DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**

#### **LESSON PLAN**

**Faculty Name: Indu K S**

**Academic Year: 2023-24 EVEN**

**SUB.CODE & Name: BCS403 DATABASE MANAGEMENT SYSTEM**

**Year/Sem/Section: II/IV/A**

**COURSE OBJECTIVES** This course will enable the students to  
 CLO1.To Provide a strong foundation in database concepts, technology, and practice.  
 CLO2.To Practice SQL programming through a variety of database problems.  
 CLO3.To Understand the relational database design principles.  
 CLO4. To demonstrate the use of concurrency and transactions in database.  
 CLO5. To Design and build database applications for real world problems.  
 CLO6.To become familiar with database storage structures and access techniques.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Describe the basic elements of a relational database management system
<b>CO2</b>	Design entity relationship for the given scenario.
<b>CO3</b>	Apply various Structured Query Language (SQL) statements for database manipulation.
<b>CO4</b>	Analyse various normalization forms for the given application.
<b>CO5</b>	Develop database applications for the given real world problem.
<b>CO6</b>	Understand the concepts related to NoSQL databases.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/04/24	2	Introduction to Databases: Introduction,	22/04/24	2	Textbook 1	Chalk and board
2.	24/04/24	2	Characteristics of database approach	24/04/24	2	Textbook 1	Chalk and board
3.	25/04/24	1	Advantages of using	25/04/24	1	Textbook 1	Chalk and

			the DBMS approach				board
4.	26/04/24	3	History of database applications.	26/04/24	3	Textbook 1	Chalk and board
5.	2/05/24	1	Overview of Database Languages and Architectures: Data Models	2/05/24	1	Textbook 1	Chalk and board
6.	3/05/24	3	Schemas, and Instances	3/05/24	3	Textbook 1	Chalk and board
7.	6/05/24	2	Three schema architecture and data independence, database languages, and interfaces,	6/05/24	2	Textbook 1	Chalk and board
8.	8/05/24	2	The Database System environment.	8/05/24	2	Textbook 1	Chalk and board
9.	9/05/24	1	Conceptual Data Modelling using Entities and Relationships: Entity types, Entity sets and structural constraints,	9/05/24	1	Textbook 1	Chalk and board
10.	13/05/24	2	Weak entity types, ER diagrams, Specialization and Generalization.	13/05/24	2	Textbook 1	Chalk and board
11.	15/05/24	2	Relational Model: Relational Model Concepts	15/05/24	2	Textbook 1	Chalk and board
12.	16/05/24	1	Relational Model Constraints and relational database schemas	16/05/24	1	Textbook 1	Chalk and board
13.	17/05/24	3	Update operations, transactions, and dealing with constraint violations.	17/05/24	3	Textbook 1	Chalk and board
14.	20/05/24	2	Relational Algebra: Unary and Binary relational operations	20/05/24	2	Textbook 1	Chalk and board
15.	22/05/24	2	Additional relational operations (aggregate, grouping, etc.)	22/05/24	2	Textbook 1	Chalk and board
16.	23/05/24	1	Examples of Queries in relational algebra	23/05/24	1	Textbook 1	Chalk and board
17.	27/05/24	2	Mapping Conceptual Design into a Logical Design: Relational Database Design using ER-to-	27/05/24	2	Textbook 1	Chalk and board



			Relational mapping.				
18.	29/05/24	2	Normalization: Database Design Theory – Introduction to Normalization using Functional and Multivalued Dependencies	29/05/24	2	Textbook 1	Chalk and board
19.	30/05/24	1	Informal design guidelines for relation schema	30/05/24	1	Textbook 1	Chalk and board
20.	31/05/24	3	Functional Dependencies	31/05/24	3	Textbook 1	Chalk and board
21.	03/06/24	2	Normal Forms based on Primary Keys	03/06/24	2	Textbook 1	Chalk and board
22.	05/06/24	2	Second and Third Normal Forms	05/06/24	2	Textbook 1	Chalk and board
23.	06/06/24	1	Boyce-Codd Normal Form	06/06/24	1	Textbook 1	Chalk and board
24.	07/06/24	3	Multivalued Dependency and Fourth Normal Form	07/06/24	3	Textbook 1	Chalk and board
25.	13/06/24	1	Join Dependencies and Fifth Normal Form	13/06/24	1	Textbook 1	Chalk and board
26.	14/06/24	3	SQL: SQL data definition and data types	14/06/24	3	Textbook 1	Chalk and board
27.	19/06/24	2	Schema change statements in SQL	19/06/24	2	Textbook 1	Chalk and board
28.	20/06/24	1	specifying constraints in SQL	20/06/24	1	Textbook 1	Chalk and board
29.	21/06/24	3	retrieval queries in SQL	21/06/24	3	Textbook 1	Chalk and board
30.	24/06/24	2	INSERT, DELETE, and UPDATE statements in SQL	24/06/24	2	Textbook 1	Chalk and board
31.	26/06/24	2	Additional features of SQL	26/06/24	2	Textbook 1	Chalk and board
32.	27/06/24	1	SQL: Advanced Queries: More complex SQL retrieval queries	27/06/24	1	Textbook 1	Chalk and board
33.	28/06/24	3	Specifying constraints as assertions and action triggers	28/06/24	3	Textbook 1	Chalk and board
34.	01/07/24	2	Views in SQL	01/07/24	2	Textbook 1	Chalk and board
35.	03/07/24	2	Transaction	03/07/24	2	Textbook 1	Chalk and

			Processing: Introduction to Transaction Processing				board
36.	04/07/24	1	Transaction and System concepts	04/07/24	1	Textbook 1	Chalk and board,PPT
37.	05/07/24	3	Desirable properties of Transactions,	05/07/24	3	Textbook 1	Chalk and board,PPT
38.	08/07/24	2	Characterizing schedules based on recoverability	08/07/24	2	Textbook 1	Chalk and board,PPT
39.	10/07/24	2	Characterizing schedules based on Serializability	10/07/24	2	Textbook 1	Chalk and board,PPT
40.	11/07/24	1	Transaction support in SQL	11/07/24	1	Textbook 1	Chalk and board,PPT
41.	12/07/24	3	Concurrency Control in Databases: Two- phase locking techniques for Concurrency control	12/07/24	3	Textbook 1	Chalk and board,PPT
42.	15/07/24	2	Concurrency control based on Timestamp ordering, Multiversion Concurrency control techniques	15/07/24	2	Textbook 1	Chalk and board,PPT
43.	18/07/24	1	Validation Concurrency control techniques	18/07/24	1	Textbook 1	Chalk and board,PPT
44.	19/07/24	3	Granularity of Data items and Multiple Granularity Locking	19/07/24	3	Textbook 1	Chalk and board,PPT
45.	22/07/24	2	NOSQL Databases and Big Data Storage Systems: Introduction to NOSQL Systems	22/07/24	2	Textbook 1	Chalk and board,PPT
46.	24/07/24	2	The CAP Theorem, Document-Based NOSQL Systems and MongoDB	24/07/24	2	Textbook 1	Chalk and board,PPT
47.	25/07/24	1	NOSQL Key-Value Stores, Column-Based or Wide Column NOSQL Systems	25/07/24	1	Textbook 1	Chalk and board,PPT
48.	26/07/24	3	NOSQL Graph Databases and Neo4j	26/07/24	3	Textbook 1	Chalk and board,PPT
49.	01/08/24	1	REVISION	01/08/24	1		
50.	02/08/24	3	REVISION	02/08/24	3		
51.	05/08/24	2	REVISION	05/08/24	2		

52.	07/08/24	2	REVISION	07/08/24	2		
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### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	<b>08/06/24</b>
2	Quiz	<b>27/07/24</b>

**Text Books:**

1. 1. Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, 7th Edition, 2017, Pearson.

**Reference Book:**

1. Database management systems, Ramakrishnan, and Gehrke, 3rd Edition, 2014, McGraw Hill



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THE OXFORD COLLEGE OF ENGINEERING  
HOSUR ROAD, BOMMANAHALLI, BANGALORE - 68  
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Lesson Plan

Date: 11/06/2023

**Subject code** : BCS306A.  
**Subject Title** : Object Oriented Programming with Java  
**Course / Branch** : B.E/ISE  
**Semester** : III  
**Academic Year** : 2023-24 (Odd)  
**Faculty Name** : KARTHIK S L

**COURSE OUTCOMES:**

1. Demonstrate proficiency in writing simple programs involving branching and looping structures.
- 2 Design a class involving data members and methods for the given scenario
3. Apply the concepts of inheritance and interfaces in solving real world problems.
4. Use the concepts of packages and exception handling in solving complex problems
5. Apply the concepts of Multithreading, auto boxing and enumeration in program development

**PREREQUISITE: Basic Knowledge of C programming language and structures**

<b>Module</b>	<b>Topic No.</b>	<b>Date</b>	<b>Topic</b>	<b>Books Referred &amp; Pages</b>
<b>I</b>	1.	15/10/23	<b>An Overview of Java: Object-Oriented Programming (Two Paradigms, Abstraction, The Three OOP Principles), Using Blocks of Code, Lexical Issues (Whitespace, Identifiers, Literals, Comments, Separators, The Java Keywords).</b>	<b>T1: 15-21</b> R1:150-160
	2.	15/10/23	<b>Data Types, Variables, and Arrays: The Primitive Types (Integers, Floating-Point Types, Characters, Booleans), Variables, Type Conversion and Casting, Automatic Type Promotion in Expressions, Arrays, Introducing Type Inference with Local Variables.</b>	<b>T1: 21-27</b> R1:160-165
	3.	15/10/23	<b>Operators: Arithmetic Operators, Relational Operators, Boolean Logical Operators, The Assignment Operator</b>	<b>T1 : 27-31</b> R1:170-175
	4.	16/10/23	<b>The ? Operator, Operator Precedence, Using Parentheses</b>	<b>T1: 31-32</b> R1:175-180
	5.	22/10/23	<b>Control Statements: Java's Selection Statements (if, The Traditional switch), Iteration Statements</b>	<b>T1 : 33-33</b> R1:180-185

			<b>(while, do-while, for, The For-Each Version of the for Loop</b>	
	6.	22/10/23	<b>Control Statements: Java's Selection Statements (if, The Traditional switch), Iteration Statements (while, do-while, for, The For-Each Version of the for Loop-Continue</b>	<b>T1: 33-36</b> R1:190-194
	7.	22/10/23	<b>Local Variable Type Inference in a for Loop, Nested Loops), Jump Statements (Using break, Using continue, return).</b>	<b>T1: 36-39</b> R1:195-205
<b>II</b>	8	23/10/23	<b>Introducing Classes: Class Fundamentals</b>	<b>T1:39-45</b> R1:200-205
	9.	29/10/23	<b>Declaring Objects</b>	<b>T1:47-47</b> R1:205-210
	10.	29/10/23	<b>Assigning Object Reference Variables</b>	<b>T1:48-56</b> R1:210-215
	11.	29/10/23	<b>Introducing Methods, Constructors</b>	<b>T1:57-69</b>
	12.	06/11/23	<b>The this Keyword, Garbage Collection.</b>	<b>T1:69-72</b>
	13.	06/11/23	<b>Methods and Classes: Overloading Methods</b>	<b>T1:73-73</b>
	14.	06/11/23	<b>Objects as Parameters</b>	<b>T1:73-77</b>
	15.	07/11/23	<b>Argument Passing, Returning Objects</b>	<b>T1:77-80</b>
	16	13/11/23	<b>Recursion, Access Control</b>	<b>T1:80-103</b>
	17.	13/11/23	<b>Understanding static</b>	<b>T1:105-109</b>
	18.	13/11/23	<b>Introducing final</b>	<b>T1:111-121</b>
	19.	14/11/23	<b>Introducing Nested</b>	<b>T1:121-121</b>
	20.	20/11/23	<b>Inner Classes</b>	<b>T1:122-128</b>
<b>III</b>	21.	20/11/23	<b>Inheritance: Inheritance Basics</b>	<b>T1:130-132</b>
	22.	20/11/23	<b>Using super, Creating a Multilevel Hierarchy</b>	<b>T1:132-134</b>
	23.	21/11/23	<b>When Constructors Are Executed, Method Overriding</b>	<b>T1:134-138</b>
	24.	03/01/24	<b>When Constructors Are Executed, Method Overriding-continue</b>	<b>T1:141-143</b>
	25.	03/01/24	<b>Dynamic Method Dispatch, Using Abstract Classes,</b>	<b>T1:157-166</b>
	26.	03/01/24	<b>Using final with Inheritance,</b>	<b>T1:167-170</b>



	27.	04/01/24	<b>Local Variable Type Inference and Inheritance, The Object Class.</b>	<b>T1:171-174</b>
	28.	10/01/24	<b>Interfaces: Interfaces, Default Interface Methods</b>	<b>T1:177-181</b>
	29.	10/01/24	<b>Use static Methods in an Interface</b>	<b>T1:183-185</b>
	30.	10/01/24	<b>Private Interface methods</b>	<b>T1:190-202</b>
<b>IV</b>	31.	11/01/24	<b>Packages and Member Access, Importing Packages.</b>	<b>T1:205-206 R5:220-225</b>
	32.	17/01/24	<b>Exceptions: Exception-Handling Fundamentals, Exception Types, Uncaught Exceptions, Using try and catch</b>	<b>T1:206-209</b>
	33.	17/01/24	<b>Multiple catch Clauses, Nested try Statements, throw</b>	<b>T1:211-216</b>
	34.	17/01/24	<b>throws, finally, Java's Built-in Exceptions</b>	<b>T1:217-219</b>
	35.	18/01/24	<b>Creating Your Own Exception Subclasses, Chained Exceptions.</b>	<b>T1:221-222</b>
<b>V</b>	36.	24/01/24	<b>Multithreaded Programming: The Java Thread Model,</b>	<b>T1:255-264</b>
	37.	24/01/24	<b>The Main Thread, Creating a Thread,</b>	<b>T1:285-288</b>
	38.	24/01/24	<b>Creating Multiple Threads, Using isAlive and join(),</b>	<b>T1:288-292</b>
	39.	25/01/24	<b>Thread Priorities, Synchronization, Interthread</b>	<b>T1:292-293</b>
	40.	31/01/24	<b>Communication, Suspending, Resuming, and Stopping Threads, Obtaining a Thread's State</b>	<b>T1:296-299</b>
	41.	31/01/24	<b>Enumerations, Type Wrappers and Autoboxing: Enumerations (Enumeration Fundamentals</b>	<b>T1:300-306</b>
	42.	31/01/24	<b>The values and valueOf() Methods),</b>	<b>T1:306-309</b>
	43.	01/02/24	<b>Type Wrappers (Character, Boolean, The Numeric Type Wrappers),</b>	<b>T1:312-312</b>
	44.	07/02/24	<b>Autoboxing</b>	<b>T1:359-364</b>
	45.	07/02/24	<b>Autoboxing and Methods</b>	<b>T1:365-369</b>
46.	07/02/24	<b>Autoboxing/Unboxing</b>	<b>T1:370-373</b>	

47.	08/02/24	<b>Occurs</b> in Autoboxing/Unboxing <b>Boolean</b> and Character Values).	<b>T1:374-374</b>
48.	09/02/24	Revision	<b>T1:375-375</b>
49.	10/02/24	Revision	<b>T1:376-384</b>
50.	10/02/24	Revision	

### **SELF-STUDY TOPICS (NOT INCLUDED IN SYLLABUS)**

<b>Sl. No.</b>	<b>Self –study Topics</b>	<b>Suggested Reference</b>
1.	Structures & Procedure–Oriented Programming system	R1 & R2.
2.	Applet functions	R2.

### **ASSIGNMENT TOPICS**

<b>Sl. No.</b>	<b>Assignment Topics</b>	<b>Submission due on</b>
1.	Classes and objects& Inheritance	20/04/23
2.	Programs based on Exception handling and Applets	25/05/23
3.	Character Extraction, String Comparison,	26/06/23

### **TEXT BOOKS:**

Java: The Complete Reference, Twelfth Edition, by Herbert Schildt, November 2021, McGraw-Hill, ISBN: 9781260463422

### **REFERENCE BOOKS:**

- 1.Programming with java, 6<sup>th</sup> Edition, By E Balagurusamy, Mar-2019, McGraw Hill, ISBN: 9781260463422
- 2.Thinking in Java, Fourth Edition. By Bruce Eckel, Prentice Hall, 2006



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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### Name of the Department

### LESSON PLAN

**Faculty Name: Dr. K THARAKA RAMI REDDY**

**Academic Year: 2023-24**

**SUB.CODE & Name: 22MBA15/ MARKETING MANAGEMENT**

**Year/Sem/Section: 1<sup>st</sup> Year/ 1<sup>st</sup> Semester/ A- Section**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To make students understand the fundamental concepts of marketing and environment in which marketing system operates.

CLO2: To gain knowledge on consumer buying behaviour and influencing factors

CLO3: To describe major bases for segment marketing, target marketing, and market positioning.

CLO4: To develop a Conceptual framework, covering basic elements of the marketing mix.

CLO5: To understand fundamental premise underlying market driven strategies and hands on practical approach.

**COURSE OUTCOMES:** At the end of the course the student will be able to:

CO1	Comprehend the concepts of Marketing Management
CO2	Gain knowledge on consumer behaviour and buying process
CO3	Understand concept of Product and Brand Management, Branding and Pricing strategies
CO4	Identify marketing channels and the concept of product distribution, techniques of sales promotion
CO5	Simply ideas into a viable marketing plan for various modes of marketing

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	12/02/24	1	Introduction to Marketing: Importance of marketing, Definitions of market and marketing, Types of Needs.	12/02/24	1	T1, R2	Smart board , ppt



2.	13/02/24	3	Elements of Marketing Concept, Functions of Marketing,	13/02/24	3	T1, R2	Smart board , ppt
3.	14/02/24	3	evolution of marketing , Marketing V/s Selling	14/02/24	3	T1, R2	Smart board , ppt
4.	16/02/24	3	Customer Value and Satisfaction, 4P's of Marketing	16/02/24	3	T1, R2	Smart board , ppt
5.	19/02/24	1	Marketing Environment	19/02/24	1	T1, R2	Smart board , ppt
6.	20/02/24	3	Marketing Environment	20/02/24	3	T1, R2	Smart board , ppt
7.	21/02/24	3	Techniques used in environment analysis, Characteristics (Micro and Macro), Marketing to the 21st century customer.	21/02/24	3	T1, R2	Smart board , ppt
8.	23/02/24	3	Analysing Consumer Behaviour: Meaning and Characteristics, Importance of consumer behaviour	23/02/24	3	T1, R2	Smart board , ppt
9.	24/02/24	1	Factors influencing Consumer Behaviour	24/02/24	1	T1, R2	Smart board , ppt
10	26/02/24	3	Consumer characteristics influencing buying behaviour	26/02/24	3	T1, R2	Smart board , ppt
11	27/02/24	3	personal factors and cultural factors	27/02/24	3	T1, R2	Smart board , ppt
12	28/02/24	3	Consumer Buying Decision Process, Buying Roles,	28/02/24	3	T1, R2	Smart board , ppt
13	01/03/24	1	Buying Motives	01/03/24	1	T1, R2	Smart board , ppt
14	04/03/24	3	The black box model of consumer behaviour.	04/03/24	3	T1, R2	Smart board , ppt
15	05/03/24	3	Psychological factors consumer	05/03/24	3	T1, R2	Smart board , ppt
16	06/03/24	3	Psychological factors consumer	06/03/24	3	T1, R2	Smart board , ppt
17	09/03/24	1	Product management and Pricing: Importance and primary objective of product management	09/03/24	1	T1, R2	Smart board , ppt
18	11/03/24	3	product levels, product hierarchy	11/03/24	3	T1, R2	Smart board , ppt
19	12/03/24	3	Classification of products ,product mix, product mix strategies	12/03/24	3	T1, R2	Smart board , ppt
20	18/03/24	3	Managing Product Life Cycle, New Product Development	18/03/24	3	T1, R2	Smart board , ppt
21	19/03/24	1	packing as a marketing tool, Role of labeling in packing, Concept of Branding, Brand Equity	19/03/24	1	T1, R2	Smart board , ppt
22	20/03/24	3	branding strategies, selecting logo, brand extension- effects	20/03/24	3	T1, R2	Smart board , ppt
23	22/03/24	3	Introducing to pricing, Significance of pricing	22/03/24	3	T1, R2	Smart board , ppt
24	25/03/24	3	factor influencing pricing, objectives	25/03/24	3	T1, R2	Smart



							board , ppt
25	26/03/24	1	Pricing Strategies, Value based Pricing ,Cost based Pricing, Market based Pricing, Competitor based Pricing, Pricing Procedure	26/03/24	1	T1, R2	Smart board , ppt
26	27/03/24	3	Case study	27/03/24	3	T1, R2	Smart board , ppt
27	30/03/24	3	<b>Distribution and Promotion:</b> Roles and purpose of Marketing Channels, Factors Affecting Channel Choice	30/03/24	3	T1, R2	Smart board , ppt
28	01/04/24	3	Channel Design	01/04/24	3	T1, R2	Smart board , ppt
29	02/04/24	1	Channel Management Decision, Channel Conflict, Designing a physical Distribution System	02/04/24	1	T1, R2	Smart board , ppt
30	03/04/24	3	Promotions-Marketing communications- IMC- objectives, steps in developing effective communication.	03/04/24	3	T1, R2	Smart board , ppt
31	05/04/24	3	Advertising: Advertising Objectives	05/04/24	3	T1, R2	Smart board , ppt
32	08/04/24	3	Advertising Budget, Advertising Copy	08/04/24	3	T1, R2	Smart board , ppt
33	10/04/24	1	AIDA model	10/04/24	1	T1, R2	Smart board , ppt
34	12/04/24	3	Traditional Vs Modern Media- Online and Mobile Advertising	12/04/24	3	T1, R2	Smart board , ppt
35	13/04/24	3	social media for Advertising. Push-pull strategies of promotion.	13/04/24	3	T1, R2	Smart board , ppt
36	15/04/24	3	Market segmentation, Targeting and Brand Positioning: Concept of Market Segmentation, Benefits	15/04/24	3	T1, R2	Smart board , ppt
37	16/04/24	1	Requisites of Effective Segmentation,	16/04/24	1	T1, R2	Smart board , ppt
38	22/04/24	3	Bases for Segmenting Consumer Markets,	22/04/24	3	T1, R2	Smart board , ppt
39	23/04/24	3	Market Segmentation Strategies. Types of Segmentation	23/04/24	3	T1, R2	Smart board , ppt
40	24/04/24	3	Targeting -Bases for identifying target Customer, Target Marketing strategies	24/04/24	3	T1, R2	Smart board , ppt
41	26/04/24	1	Positioning - Meaning, Tasks involved in Positioning.	26/04/24	1	T1, R2	Smart board , ppt
42	27/04/24	3	Monitoring brands performance and positioning	27/04/24	3	T1, R2	Smart board , ppt
43	29/04/24	3	Product Differentiation Strategies.	29/04/24	3	T1, R2	Smart board , ppt
44	30/04/24	3	Emerging Trends in Marketing: Marketing Planning. Concepts of B2B	30/04/24	3	T1, R2	Smart board , ppt



			marketing, Service Marketing, Digital and social media Marketing				
45	03/05/24	1		03/05/24	1	T1, R2	Smart board , ppt
46	06/05/24	3	Green Marketing, Event Marketing, Marketing Audit,	06/05/24	3	T1, R2	Smart board , ppt
47	07/05/24	3	Sponsorship, Cause Related Marketing	07/05/24	3	T1, R2	Smart board , ppt
48	08/05/24	3	Marketing for Non-Profit Organizations, Relationship marketing	08/05/24	3	T1, R2	Smart board , ppt
49	11/05/24	1	Marketing Strategies for Leaders, Challengers, Followers and Startups.	11/05/24	1	T1, R2	Smart board , ppt
50	13/05/24	3	Social Responsibility of marketing	13/05/24	3	T1, R2	Smart board , ppt
51	14/05/24	3	Revision on Module 2	14/05/24	3	T1, R2	Smart board , ppt
52	15/05/24	3	Revision on Module 2	15/05/24	3	T1, R2	Smart board , ppt
53	17/05/24	1	Revision on Module 3	17/05/24	1	T1, R2	Smart board , ppt
54	24/05/24	3	Revision on Module 5	24/05/24	3	T1, R2	Smart board , ppt
55	25/05/24	3	Revision on Module 6	25/05/24	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-Integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

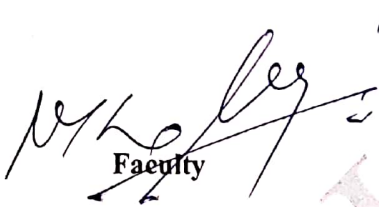
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list: Assignment	30/03/2024
2	CCE-2 from the above list: Class Room Presentations	29,30/04/2024

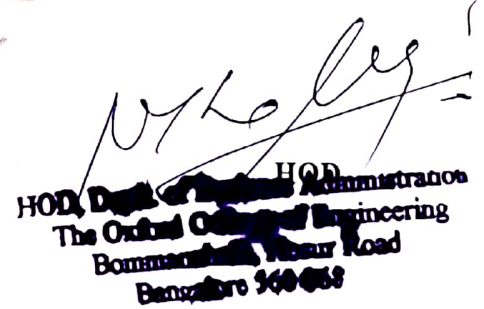
**Text Books:**

1. Marketing Management- Indian Context, Global Perspective by Ramaswamy & Namakumari by SAGE publication, 6th Edition.
2. Marketing Management: A South Asian Perspective by Kotler, Keller, Koshy & Jha by Pearson publication, Latest Edition

**Reference Book:**

1. Marketing by Lamb, Hair, Mc Danniel by Cengage Learning, Latest edition.
2. Fundamentals of Marketing Management, Etzel M J B J Walker & William J Stanton by Tata Macgraw Hill, Latest edition.

  
Faculty

  
HOD, Dept. of Business Administration  
The Oxford College of Engineering  
Bommasandra, Mysur Road  
Bangalore 560 069



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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## **THE OXFORD COLLEGE OF ENGINEERING**

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**Name of the Department: MBA**

### **LESSON PLAN**

**Faculty Name: DR. K THARAKA RAMI REDDY**

**Academic Year: 2023-24**

**SUB.CODE & Name: 22MBA25/ STRATEGIC MANAGEMENT**

**Year/Sem/Section: 1<sup>st</sup> Year/ 2<sup>nd</sup> Sem/ B-Section:**

**COURSE OBJECTIVES** This course will enable the students to  
 CLO1: To provide insights into the core concepts of strategic management.  
 CLO2: To evaluate various business strategies in dynamic market environments.  
 CLO3: To gain insights into various strategic management models.

**COURSE OUTCOMES:** At the end of the course the student will be able to :

<b>CO1</b>	Students should get clear idea about the concept of Strategic Management, its relevance, Characteristics, process nature and purpose.
<b>CO2</b>	Student to acquire an understanding of how firms successfully institutionalize a strategy and create an organizational structure for domestic and overseas operations and gain competitive advantage.
<b>CO3</b>	To give the students an insight on strategy at different levels of an organization to gain competitive advantage.
<b>CO4</b>	To help students understand the strategic drive in multinational firms and their decisions in different markets.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedago (as per the syllabi)
	Date	Hr		Date	Hr		
1.	Mon, 15-07-2024	3	Meaning of strategy and strategic management	Mon, 15-07-2024	3	T1, R2	Smar board ppt
2.	Tue, , 16-07-2024	5	Stages of strategic management	Tue, , 16-07-2024	5	T1, R2	Smar board ppt
3.	Thu,18-07-2024	2	strategic management model	Thu,18-07-2024	2	T1, R2	Smar board





							ppt
4.	Fri, 19-07-2024	5	benefits of strategic management,	Fri, 19-07-2024	5	T1, R2	Smart board , ppt
5.	Mon, 22-07-2024	3	key terms in strategic management Competitive advantage,	Mon, 22-07-2024	3	T1, R2	Smart board , ppt
6.	Tue, , 23-07-2024	5	strategists, vision, mission	Tue, , 23-07-2024	5	T1, R2	Smart board , ppt
7.	Thu,25-07-2024	2	long term objectives, strategies, annual objectives and policies.	Thu,25-07-2024	2	T1, R2	Smart board , ppt
8.	Fri, 26-07-2024	5	The process of performing an external audit	Fri, 26-07-2024	5	T1, R2	Smart board , ppt
9.	Sat, 27-07-2024	3	Nature of an external audit	Sat, 27-07-2024	3	T1, R2	Smart board , ppt
10.	Mon, 29-07-2024	3	key external forces	Mon, 29-07-2024	3	T1, R2	Smart board , ppt
11.	Tue, , 30-07-2024	5	industry analysis	Tue, , 30-07-2024	5	T1, R2	Smart board , ppt
12.	Thu,01-08-2024	2	industry analysis	Thu,01-08-2024	2	T1, R2	Smart board , ppt
13.	Fri, 02-08-2024	5	industry analysis	Fri, 02-08-2024	5	T1, R2	Smart board , ppt
14.	Mon, 05-08-2024	3	competitive forces	Mon, 05-08-2024	3	T1, R2	Smart board , ppt
15.	Tue, , 06-08-2024	2	competitive analysis-porter's five forces model	Tue, , 06-08-2024	2	T1, R2	Smart board , ppt
16.	Thu,08-08-2024	2	key success factors	Thu,08-08-2024	2	T1, R2	Smart board , ppt
17.	Fri, 09-08-2024	5	Nature of internal audit	Fri, 09-08-2024	5	T1, R2	Smart board , ppt
18.	Sat, 10-08-2024	3	key internal forces	Sat, 10-08-2024	3	T1, R2	Smart board , ppt
19.	Mon, 12-08-2024	3	process of performing internal audit	Mon, 12-08-2024	3	T1, R2	Smart board , ppt
20.	Tue, , 13-08-2024	5	Resource Based View(RBV)	Tue, , 13-	5	T1, R2	Smart

				08-2024			board , ppt
21	Fri,16-08-2024	5	Integrating strategy and culture	Fri,16-08-2024	5	T1, R2	Smart board , ppt
22	Mon, 19-08-2024	3	SWOT analysis	Mon, 19-08-2024	3	T1, R2	Smart board , ppt
23	Fri, , 23-08-2024	2	Value chain analysis	Fri, , 23-08-2024	2	T1, R2	Smart board , ppt
24	Sat,24-08-2024	3	Bench marking	Sat,24-08-2024	3	T1, R2	Smart board , ppt
25	Mon, 26-08-2024	3	Internal factor evaluation matrix	Mon, 26-08-2024	3	T1, R2	Smart board , ppt
26	Tue, , 27-08-2024	5	The business vision and mission	Tue, , 27-08-2024	5	T1, R2	Smart board , ppt
27	Thu,08-29-2024	2	process of developing vision and mission	Thu,08-29-2024	2	T1, R2	Smart board , ppt
28	Fri, 30-08-2024	5	importance of vision and mission statement	Fri, 30-08-2024	5	T1, R2	Smart board , ppt
29	Sat, 31-08-2024	3	characteristics of mission statement	Sat, 31-08-2024	3	T1, R2	Smart board , ppt
30	Mon, 02-09-2024	3	long term objectives	Mon, 02-09-2024	3	T1, R2	Smart board , ppt
31	Tue, , 03-09-2024	5	types of strategies, levels of strategies	Tue, , 03-09-2024	5	T1, R2	Smart board , ppt
32	Thu,05-09-2024	2	integration strategies, intensive strategies	Thu,05-09-2024	2	T1, R2	Smart board , ppt
33	Fri, 06-09-2024	5	diversification strategies, defensive strategies	Fri, 06-09-2024	5	T1, R2	Smart board , ppt
34	Mon, 09-09-2024	3	Porters generic strategies, Blue Ocean Strategy	Mon, 09-09-2024	3	T1, R2	Smart board , ppt
35	Tue, , 10-09-2024	5	Nature of strategy implementation	Tue, , 10-09-2024	5	T1, R2	Smart board , ppt
36	Thu,12-09-2024	2	annual objectives	Thu,12-09-2024	2	T1, R2	Smart board , ppt



37	Fri, 13-09-2024	5	policies,	Fri, 13-09-2024	5	T1, R2	Smart board , ppt
38	Mon, 14-09-2024	3	resource allocation	Mon, 14-09-2024	3	T1, R2	Smart board , ppt
39	Fri, 20-09-2024	5	managing conflicts	Fri, 20-09-2024	5	T1, R2	Smart board , ppt
40	Mon, 23-09-2024	3	restructuring, reengineering and e-engineering	Mon, 23-09-2024	3	T1, R2	Smart board , ppt
41	Tue, , 24-09-2024	5	linking performance and pay to strategies	Tue, , 24-09-2024	5	T1, R2	Smart board , ppt
42	Thu,26-09-2024	2	creating a strategy-supportive culture	Thu,26-09-2024	2	T1, R2	Smart board , ppt
43	Fri, 27-09-2024	5	operations concerns in implementing strategies	Fri, 27-09-2024	5	T1, R2	Smart board , ppt
44	Sat, 28-09-2024	3	The process of evaluating strategies	Sat, 28-09-2024	3	T1, R2	Smart board , ppt
45	Mon, 30-09-2024	3	strategy evaluation framework	Mon, 30-09-2024	3	T1, R2	Smart board , ppt
46	Tue, , 01-10-2024	5	strategy evaluation framework	Tue, , 01-10-2024	5	T1, R2	Smart board , ppt
47	Thu,03-10-2024	2	balanced score card	Thu,03-10-2024	2	T1, R2	Smart board , ppt
48	Fri, 04-10-2024	5	characteristics of an effective evaluation system	Fri, 04-10-2024	5	T1, R2	Smart board , ppt
49	Mon, 07-10-2024	3	contingency planning	Mon, 07-10-2024	3	T1, R2	Smart board , ppt
50	Tue, , 08-10-2024	5	CASE STUDY	Tue, , 08-10-2024	5	T1, R2	Smart board , ppt
51	Thu,10-10-2024	2	CASE STUDY	Thu,10-10-2024	2		Class Room Discussion
52	Mon, 14-10-2024	3	CASE STUDY	Mon, 14-10-2024	3		Class Room Discussion
53	Tue, , 19-10-2024	5	CASE STUDY	Tue, , 19-10-2024	5		Class Room Discussion

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

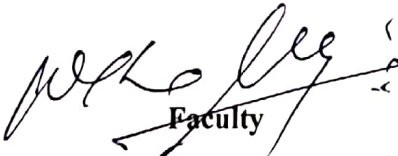
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list: Assignment	30-08-2024
2	CCE-2 from the above list	10,14,19-Oct-2024


### Text Books:

1. Strategic Management Fred R. David Prentice Hall India Publication.

### Reference Book:

1. Crafting and Executing Strategy: The Quest for Competitive Advantage – Concepts and Cases  
Arthur A. Thompson Jr. Margaret A. Peteraf John E. Gamble, A. J. Strickland III, Arun K. Jain, McGraw Hill Education, 16/e 2016
2. Contemporary Strategy Analysis, Robert M. Grant, Wiley India, 10e

  
Faculty

  
HOD, Dept. of Business Administration  
The O. J. S. College of Engineering  
Bommasandra, Hosur Road  
Bangalore 560 068



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### Name of the Department

### LESSON PLAN

**Faculty Name: Dr. K THARAKA RAMI REDDY**

**Academic Year: 2023-24**

**SUB.CODE & Name: 22MBAHR303/ Recruitment & Selection**

**Year/Sem/Section: 2<sup>nd</sup> / 3<sup>rd</sup>**

**COURSE OBJECTIVES** This course will enable the students to

**CLO1:** To recite the theories and various steps involved in Recruitment and Selection

**CLO2:** To describe and explain in her/his own words, the relevance and importance of Recruitment and Selection in the Organization

**CLO3:** To apply and solve the workplace problems through Recruitment and Selection intervention

**CLO4:** To classify and categorize in differentiating between the best method to be adopted by organization related to Recruitment and Selection

**CLO5:** To compare and contrast different approaches of Recruitment and Selection framework for solving the complex issues and problem

**CLO6:** To design and develop an original framework and framework in dealing with the problems in the organization

### **COURSE OUTCOMES:**

<b>CO1</b>	Gain the practical insight of various principles and practices of recruitment and selection
<b>CO2</b>	Acquire knowledge of latest conceptual framework used in recruitment and selection process and procedure applied in various industries
<b>CO3</b>	. Illustrate the application of recruitment and selection tools and techniques in various sectors.
<b>CO4</b>	Develop a greater understanding about strategies for workforce planning and assessment, analyse the hiring management system followed in various industries.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	Fri, Dec 1, 2023	4	<b>Workforce Planning and Recruitment Analytics: Concept of Work,</b>	Fri, Dec 1, 2023	4	T1, R2	Smart board , ppt
2.	Mon, Dec 4, 2023	5	<b>Organisation's Work and Jobs; Millennials at the work place; Key</b>	Mon, Dec 4, 2023	5	T1, R2	Smart board , ppt





			Characteristicsof Millennials;				
3.	Tue, Dec 5, 2023	3	Types of Millennial; The Evolution of Work Structure; Organising the Work;	Tue, Dec 5, 2023	3	T1, R2	Smart board , ppt
4.	Wed, Dec6, 2023	2	Strategic Job Redesign and Its Benefits; Strategic Issues in Recruitment; What make Bad Recruitment;	Wed, Dec6, 2023	2	T1, R2	Smart board , ppt
5.	Thu, Dec 7, 2023	6	Overview of the Hiring Process; Recruitment Metrics; Factors Affecting Recruitment;	Thu, Dec 7, 2023	6	T1, R2	Smart board , ppt
6.	Fri, Dec 8, 2023	4	Recruitment Strategy: An Internal Approach	Fri, Dec 8, 2023	4	T1, R2	Smart board , ppt
7.	sat , Dec 9, 2023	5	Recruitment Strategy: An External Approach;.	sat , Dec 9, 2023	5	T1, R2	Smart board , ppt
8.	Mon, Dec11, 2023	5	Legal and Ethical Considerations; Organisational Best Practices	Mon, Dec11, 2023	5	T1, R2	Smart board , ppt
9.	Tue, Dec 12, 2023	3	<b>Job Analysis, Job Description and Job Design:</b> Identify the Job to Examine; Determine Appropriate Information Sources and Collect Job-Related Data;	Tue, Dec 12, 2023	3	T1, R2	Smart board , ppt
10	Wed, Dec13, 2023	2	Job Description; Competency and Competency Ice Berg Model;	Wed, Dec13, 2023	2	T1, R2	Smart board , ppt
11	Thu, Dec 14, 2023	6	Why Competency Based Recruitment;	Thu, Dec 14, 2023	6	T1, R2	Smart board , ppt
12	Fri, Dec 15, 2023	4	Sources of Recruitment	Fri, Dec 15, 2023	4	T1, R2	Smart board , ppt
13	Mon, Dec 18, 2023	5	Different steps of job search;	Mon, Dec 18, 2023	5	T1, R2	Smart board , ppt
14	Tue, Dec 19, 2023	3	Motivational Job Specification;	Tue, Dec 19, 2023	3	T1, R2	Smart board , ppt
15	Wed, Dec20, 2023	2	Creation of Functional Specification;	Wed, Dec20, 2023	2	T1, R2	Smart board , ppt
16	Thu, Dec 21, 2023	6	Creation of Behavioural Specification;	Thu, Dec 21, 2023	6	T1, R2	Smart board , ppt
17	Fri, Dec 22, 2023	4	Employer branding;	Fri, Dec 22, 2023	4	T1, R2	Smart board , ppt
18	sat , Dec 23, 2023	3	Social Media; Job Design.	sat , Dec 23, 2023	3	T1, R2	Smart board , ppt
19	Tue, Dec 26, 2023	3	Job Evaluation: The Job Evaluation Process;	Tue, Dec 26, 2023	3	T1, R2	Smart board , ppt
20	Wed, Dec27, 2023	2	Obtain Job KSAOs, Qualifications, Working Conditions, and Essential Duties;	Wed, Dec27, 2023	2	T1, R2	Smart board , ppt
21	Thu, Dec 28,	6	Examine Compensable Factors Using	Thu, Dec	6	T1, R2	Smart

	2023		the Rating/Weighting Evaluation Method;	28, 2023			board , ppt
22	Fri, Dec 29, 2023	4	Determine Overall Job Value;	Fri, Dec 29, 2023	4	T1, R2	Smart board , ppt
23	Sat, Dec 30, 2023	2	Hay Group—Pioneer in Job Evaluation;.	Sat, Dec 30, 2023	2	T1, R2	Smart board , ppt
24	Mon, Jan 1, 2024	5	Determining Compensation using Job Evaluation Data;	Mon, Jan 1, 2024	5	T1, R2	Smart board , ppt
25	Tue, Jan 2, 2024	3	Legal and Ethical Considerations for Job Evaluation;	Tue, Jan 2, 2024	3	T1, R2	Smart board , ppt
26	Wed, Jan3, 2024	2	Online Salary Survey	Wed, Jan3, 2024	2	T1, R2	Smart board , ppt
27	Thu, Jan 4, 2024	6	Case study	Thu, Jan 4, 2024	6	T1, R2	Smart board , ppt
28	Fri, Jan 5 , 2024	4	Case study	Fri, Jan 5 , 2024	4	T1, R2	Smart board , ppt
29	Thu, Jan 11, 2024	6	Case study	Thu, Jan 11, 2024	6	T1, R2	Smart board , ppt
30	Fri, Jan 12, 2024	4	Selection and Interview Strategy: Interview Strategy and Process;	Fri, Jan 12, 2024	4	T1, R2	Smart board , ppt
31	Sat, Jan 13, 2024	6	Millennials shaping the Recruitment landscape in organizations;	Sat, Jan 13, 2024	6	T1, R2	Smart board , ppt
32	Tue, Jan 16, 2024	3	Strategies for R&s Generation Y into the workforce Developing Effective.	Tue, Jan 16, 2024	3	T1, R2	Smart board , ppt
33	Wed, Jan17, 2024	2	Interviewers;	Wed, Jan17, 2024	2	T1, R2	Smart board , ppt
34	Thu, Jan 18, 2024	6	Interviewing Techniques;	Thu, Jan 18, 2024	6	T1, R2	Smart board , ppt
35	Fri, Jan 19 , 2024	4	Legal and Ethical Considerations in the Interview Process;	Fri, Jan 19 , 2024	4	T1, R2	Smart board , ppt
36	Mon, Jan22, 2024	5	The overall BEI Process;	Mon, Jan22, 2024	5	T1, R2	Smart board , ppt
37	Tue, Jan 23, 2024	3	The overall BEI Process	Tue, Jan 23, 2024	3	T1, R2	Smart board , ppt
38	Wed, Jan 24, 2024	2	Assessment Centre's;	Wed, Jan 24, 2024	2	T1, R2	Smart board , ppt
39	Thu, Jan 25, 2024	6	Simulations	Thu, Jan 25, 2024	6	T1, R2	Smart board , ppt
40	Sat, Jan 27, 2024	4	Simulations	Sat, Jan 27, 2024	4	T1, R2	Smart board , ppt
41	Mon, Jan29, 2024	5	Testing and Assessment: Testing in Occupational Selection;	Mon, Jan29, 2024	5	T1, R2	Smart board , ppt
42	Tue, Jan 30, 2024	3	Test related to Assessment of Knowledge, Skills, and Abilities;	Tue, Jan 30, 2024	3	T1, R2	Smart board , ppt
43	Wed, Jan 31, 2024	2	Personality Assessment;	Wed, Jan 31, 2024	2	T1, R2	Smart board , ppt



44	Thu, Feb 1, 2024	6	The Birkman method and MBTI® comparison	Thu, Feb 1, 2024	6	T1, R2	Smart board , ppt
45	Fri, Feb 2, 2024	4	The Birkman method and MBTI® comparison	Fri, Feb 2, 2024	4	T1, R2	Smart board , ppt
46	Mon, Feb 5, 2024	5	FIRO-B	Mon, Feb 5, 2024	5	T1, R2	Smart board , ppt
47	Tue, Feb 6, 2024	3	Honesty and Integrity Assessment;	Tue, Feb 6, 2024	3	T1, R2	Smart board , ppt
48	Wed, Feb 7, 2024	2	Various Non-Interviewing Methods;	Wed, Feb 7, 2024	2	T1, R2	Smart board , ppt
49	Mon, Feb12, 2024	5	Graphology; Skills Assessment; Games and Group Activity for Leadership Assessment;	Mon, Feb12, 2024	5	T1, R2	Smart board , ppt
50	Tue, Feb 13, 2024	3	Administration of Tests and Assessments;	Tue, Feb 13, 2024	3	T1, R2	Smart board , ppt
51	Wed, Feb14 , 2024	2	Key Interviewer Skills.	Wed, Feb14 , 2024	2	T1, R2	Smart board , ppt
52	Thu, Feb 15, 2024	6	Making the Hire;	Thu, Feb 15, 2024	6	T1, R2	Smart board , ppt
53	Fri, Feb 16, 2024	4	Assessment of Candidate and Job Fit:	Fri, Feb 16, 2024	4	T1, R2	Smart board , ppt
54	Mon, Feb19, 2024	5	Unique Recruitment strategies;	Mon, Feb19, 2024	5	T1, R2	Smart board , ppt
55	Tue, Feb 20, 2024	3	Biodata and Application Forms	Tue, Feb 20, 2024	3	T1, R2	Smart board , ppt
56	Wed, Feb21 , 2024	2	Implications of Using Social Media Content in Hiring decisions	Wed, Feb21 , 2024	2	T1, R2	Smart board , ppt
57	Thu, Feb 22, 2024	6	Background Checks; Reference Checks	Thu, Feb 22, 2024	6	T1, R2	Smart board , ppt
58	Fri, Feb 23, 2024	4	Pre-employment Testing;	Fri, Feb 23, 2024	4	T1, R2	Smart board , ppt
59	Sat, Feb 24, 2024	5	Making a Job Offer;	Sat, Feb 24, 2024	5	T1, R2	Smart board , ppt
60	Mon, Feb26, 2024	5	Transitioning from Job Candidate to Employee;	Mon, Feb26, 2024	5	T1, R2	Smart board , ppt
61	Tue, Feb 27, 2024	3	Induction;	Tue, Feb 27, 2024	3	T1, R2	Smart board , ppt
62	Wed, Feb28 , 2024	2	Placement.	Wed, Feb28 , 2024	2	T1, R2	Smart board , ppt
63	Thu, Feb 29, 2024	6	Case Study	Thu, Feb 29, 2024	6	T1, R2	Smart board , ppt
64	Fri March 1, 2024	4	Case Study	Fri March 1, 2024	4	T1, R2	Smart board , ppt

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

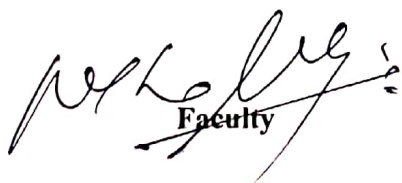
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list: Assignment-1	29/02/2023
2	CCE-2 from the above list: Class Presentations:	January, 29,30 & 31. 2024

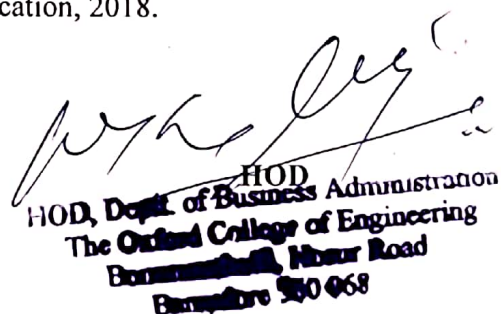
### Text Books:

- 1 How to Recruit, Incentives and Retain Millennials., Rohtak, Sage Publications, 2019.
2. Recruitment and Selection- Strategies for Workforce Planning & Assessment, Carrie A. Picardi, Sage Publication, 2019.

### Reference Book:

1. Human Resource Management, R. C. Sharma, Sage Publication, 2019.
2. Human Resource Management, Amitabha Sengupta, Sage Publication, 2018.

  
Faculty

  
HOD  
HOD, Dept. of Business Administration  
The Oxford College of Engineering  
Bommasandra, Hosur Road  
Bangalore 560 068



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Name of the Department: MBA**

### **LESSON PLAN**

**Faculty Name: DR. K THARAKA RAMI REDDY**

**Academic Year: 2023-24**

**SUB.CODE & Name: 22MBAMM403/ STRATEGIC BRAND MANAGEMENT**

**Year/Sem/Section: 2<sup>nd</sup> Year/ 4<sup>th</sup> Sem/ B-Section:**

**COURSE OBJECTIVES** This course will enable the students to  
**CLO1:** To appreciate the relationship between corporate strategy and Brand Management.  
**CLO2:** To explore the various issues related to Brand Management, brand association, brand identity, brand architecture, leveraging brand assets, brand portfolio management.  
**CLO3:** To develop familiarity and competence with the strategies and tactics involved in building, leveraging and defending strong brands in different sectors.

**COURSE OUTCOMES:** At the end of the course the student will be able to :

<b>CO1</b>	Comprehend & correlate all the management functions to brand creation
<b>CO2</b>	Ability to develop the branding strategies
<b>CO3</b>	Demonstrate their acumen in applying managerial and behavioural concepts in creating brand equity
<b>CO4</b>	Ability to analyse the global brands and their SWOT.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	Tue, 11-06-2024	1	<b>Introduction:</b> Meaning of Brand, Concepts	Tue, 11-06-2024	1	T1, R2	Smart board , ppt
2.	Wed, 12-06-2024	4	Evolution of Brands, Functions of Brand to consumer, Role of Brand-Advantages of Brand	Wed, 12-06-2024	4	T1, R2	Smart board , ppt
3.	Thu, 13-06-	5	Product Vs Brand	Thu, 13-	5	T1, R2	Smart





	2024			06-2024			board , ppt
4.	Fri, 14-06-2024	1	<b>Branding-</b> Meaning, Creation of Brands through goods, services, people, Organization, Retail stores, places, online, entertainment, ideas,	Fri, 14-06-2024	1	T1, R2	Smart board , ppt
5.	Tue, 18-06-2024	1	<b>Branding-</b> Meaning, Creation of Brands through goods, services, people, Organization, Retail stores, places, online, entertainment, ideas,	Tue, 18-06-2024	1	T1, R2	Smart board , ppt
6.	Wed, 19-06-2024	4	challenges to Brand builders. <b>Brand Management-</b> Meaning & Definition.	Wed, 19-06-2024	4	T1, R2	Smart board , ppt
7.	Thu, 20-06-2024	5	Strategic Brand Management Process-Meaning, Steps in Brand Management Process, Strong Indian Brands	Thu, 20-06-2024	5	T1, R2	Smart board , ppt
8.	Fri, 21-06-2024	1	<b>Meaning, Model of CBBE:</b> Brand Equity: Meaning, Sources	Fri, 21-06-2024	1	T1, R2	Smart board , ppt
9.	Sat 22-06-2024	4	Steps in Building Brands, Brand building blocks Resonance, Judgments, Feelings, performance, imagery, salience	Sat 22-06-2024	4	T1, R2	Smart board , ppt
10	Tue, 25-06-2024	1	Steps in Building Brands, Brand building blocks Resonance, Judgments, Feelings, performance, imagery, salience	Tue, 25-06-2024	1	T1, R2	Smart board , ppt
11	Wed, 26-06-2024	4	Brand Building David Aaker's Brand Equity Model Implications	Wed, 26-06-2024	4	T1, R2	Smart board , ppt
12	Thu, 27-06-2024	5	Brand Identity & Positioning: Meaning of Brand identity, Need for Identity &	Thu, 27-06-2024	5	T1, R2	Smart board , ppt
13	Fri, 28-06-2024	1	Positioning, Dimensions of brand identity, Brand identity prism.	Fri, 28-06-2024	1	T1, R2	Smart board , ppt
14	Sat 29-v-2024	4	Brand positioning: Meaning, Point of parity & Point of difference,	Sat 29-v-2024	4	T1, R2	Smart board , ppt
15	Tue, 02-07-2024	1	positioning guidelines, Brand Value: Definition, Core Brand values, Brand mantras, Internal branding.	Tue, 02-07-2024	1	T1, R2	Smart board , ppt
16	Wed, 03-07-2024	4	<b>Meaning of Brand Knowledge:</b> Dimensions of Brand Knowledge	Wed, 03-07-2024	4	T1, R2	Smart board , ppt

17	Thu, 04-07-2024	5	Dimensions of Brand Knowledge.	Thu, 04-07-2024	5	T1, R2	Smart board , ppt
18	Fri, 05-07-2024	1	Meaning of Leveraging Secondary Brand Knowledge	Fri, 05-07-2024	1	T1, R2	Smart board , ppt
19	Tue, 09-07-2024	1	Conceptualizing the leverage process	Tue, 09-07-2024	1	T1, R2	Smart board , ppt
20	Wed, 10-07-2024	4	Criteria for choosing brand elements,.	Wed, 10-07-2024	4	T1, R2	Smart board , ppt
21	Thu, 11-07-2024	5	options & tactics for brand elements-Brand name, Naming guidelines, Naming procedure, Awareness,	Thu, 11-07-2024	5	T1, R2	Smart board , ppt
22	Fri, 12-07-2024	1	options & tactics for brand elements-Brand name, Naming guidelines, Naming procedure, Awareness	Fri, 12-07-2024	1	T1, R2	Smart board , ppt
23	Sat,13-07-2024	4	Brand Associations, Logos & Symbols & their benefits, Characters & Benefits, Slogans & Benefits, Packaging. Leveraging Brand Knowledge	Sat,13-07-2024	4	T1, R2	Smart board , ppt
24	Tue, 23-07-2024	1	Brand hierarchy, Branding strategy	Tue, 23-07-2024	1	T1, R2	Smart board , ppt
25	Wed, 24-07-2024	4	Brand extension and brand transfer,	Wed, 24-07-2024	4	T1, R2	Smart board , ppt
26	Thu, 25-07-2024	5	Managing Brands overtime. Brand Architecture and brand consolidation.	Thu, 25-07-2024	5	T1, R2	Smart board , ppt
27	Fri, 26-07-2024	1	Brand Imitations: Meaning of Brand Imitation, Kinds of imitation.	Fri, 26-07-2024	1	T1, R2	Smart board , ppt
28	Sat,27-07-2024	4	Factors affecting Brand Imitation, Imitation Vs Later market entry,	Sat,27-07-2024	4	T1, R2	Smart board , ppt
29	Tue, 30-07-2024	1	First movers advantages, Free rider effects,.	Tue, 30-07-2024	1	T1, R2	Smart board , ppt
30	Wed, 31-07-2024	4	Benefits for later entrants, Imitation Strategies	Wed, 31-07-2024	4	T1, R2	Smart board , ppt
31	Thu, 01-08-2024	5	Establishing brand Equity Management Systems. Methods for measuring Brand Equity-Quantitative Techniques	Thu, 01-08-2024	5	T1, R2	Smart board , ppt
32	Fri, 02-07-2024	1	Establishing brand Equity Management Systems. Methods for measuring Brand Equity-Quantitative Techniques	Fri, 02-07-2024	1	T1, R2	Smart board , ppt



33	Tue, 06-08-2024	1	Quantitative Techniques	Tue, 06-08-2024	1	T1, R2	Smart board , ppt
34	Wed, 07-08-2024	4	Making Brands go Global: Geographic extension	Wed, 07-08-2024	4	T1, R2	Smart board , ppt
35	Thu, 08-08-2024	5	sources of opportunities for global brand, single name to global brand, consumers & globalization	Thu, 08-08-2024	5	T1, R2	Smart board , ppt
36	Fri, 09-08-2024	1	conditions favoring marketing barriers to globalization	Fri, 09-08-2024	1	T1, R2	Smart board , ppt
37	Sat, 10-08-2024	4	managerial blockages	Sat, 10-08-2024	4	T1, R2	Smart board , ppt
38	Tue, 13-08-2024	1	<b>Global branding:</b> Organization for a global brand	Tue, 13-08-2024	1	T1, R2	Smart board , ppt
39	Wed, 14-08-2024	4	pathways to globalization	Wed, 14-08-2024	4	T1, R2	Smart board , ppt
40	Fri, 16-08-2024	1	Luxury Brand Management: Luxury definition and relativity, luxury goods and luxury brands	Fri, 16-08-2024	1	T1, R2	Smart board , ppt
41	Thu, 22-08-2024	5	basic psychological phenomena associated with luxury purchase	Thu, 22-08-2024	5	T1, R2	Smart board , ppt
42	Fri, 23-08-2024	1	, luxury marketing mix	Fri, 23-08-2024	1	T1, R2	Smart board , ppt
43	Tue, 27-08-2024	1	luxury retail	Tue, 27-08-2024	1	T1, R2	Smart board , ppt
44	Wed, 28-08-2024	4	international luxury markets	Wed, 28-08-2024	4	T1, R2	Smart board , ppt
45	Thu, 29-08-2024	5	historical leaders and emerging countries.	Thu, 29-08-2024	5	T1, R2	Smart board , ppt
46	Fri, 30-08-2024	1	Case Study	Fri, 30-08-2024	1	T1, R2	Smart board , ppt
47	Tue, 03-09-2024	1	Case Study	Tue, 03-09-2024	1	T1, R2	Smart board , ppt
48	Wed, 04-09-2024	4	Case Study	Wed, 04-09-2024	4	T1, R2	Smart board , ppt
49	Thu, 05-09-2024	5	Case Study	Thu, 05-09-2024	5	T1, R2	Smart board , ppt
50	Fri, 06-09-2024	1	Case Study	Fri, 06-09-2024	1	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

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- ii) Seminars
- iii) Oral/Online Quizzes
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- xii) Industrial / Social / Rural projects
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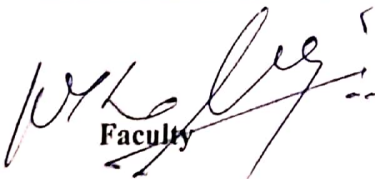
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list: Assignment	15-07-2024
2	CCE-2 from the above list	10.11.12.13.14-Sept-2024

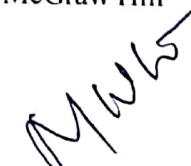
**Text Books:**

1. Strategic Brand Management, Building Measuring & Managing, Kevin Lane Keller, Pearson Education Latest Edition

**Reference Book:**

1. Strategic Brand Management Jean, Noel, Kapferer Kogan Page India, Latest Edition
2. Brand Building and Advertising Concepts and Cases, M B Parameswaran Tata McGraw Hill Publication Latest Edition.

  
Faculty

  
HOD, Dept. of Business Administration  
The Oxford College of Engineering  
Bommasandra, Hosur Road  
Bangalore 560 087



1.	25/04/24	2	Big Data and Analytics Example Applications, Basic Nomenclature, Analysis Process Model, Analytical Model Requirements	25/04/24	2	T1, R2	Smart board , pp
2.	26/04/24	1,4	Types of Data, Sources, Sampling, Types of Data Elements	26/04/24	1,4	T1, R2	Smart board , ppt
3.	27/04/24	3	Data Exploration, Exploratory Statistical, Analysis,	27/04/24	3	T1, R2	Smart board , ppt
4.	2/05/24	2	Missing Values, Outlier Detection and Treatment	2/05/24	2	T1, R2	Smart board , ppt

5.	03/05/24	2	Standardizing Data Labels, Categorization	03/05/24	2	T1, R2	Smart board , ppt
6.	09/05/24	1,4	Hadoop's Parallel World,Data discovery, Open source technology for Big Data Analytics	09/05/24	1,4	T1, R2	Smart board , ppt
7.	11/05/24	3	Cloud and Big Data	11/05/24	3	T1, R2	Smart board , ppt
8.	16/05/24	2	Mobile Business Intelligence and Big Data, Crowd Sourcing Analytics	16/05/24	2	T1, R2	Smart board , ppt
9.	17/05/24	2	Inter- and Trans  Firewall Analytics	17/05/24	2	T1, R2	Smart board , ppt
10	22 and 23	1,4	<b>CIE-1</b>	22 and 23	1,4	T1, R2	Smart board , ppt
11	24/05/24	3	Data, Data Storage and Analysis	24/05/24	3	T1, R2	Smart board , ppt
12	25/05/24	2	Comparison with Other Systems, RDBMS, Grid Computing	25/05/24	2	T1, R2	Smart board , ppt
13	30/05/24	2	Volunteer Computing,	30/05/24	2	T1, R2	Smart board , ppt
14	31/05/24	1,4	A Brief History of Hadoop, Apache  Hadoop and the Hadoop Ecosystem Hadoop Releases	31/05/24	1,4	T1, R2	Smart board , ppt
15	06/06/24	3	The Hadoop Distributed File system The Design of HDFS, HDFS Concepts, Blocks, Namenodes and Datanodes, HDFS Federation, HDFS High Availability, Interface,	06/06/24	3	T1, R2	Smart board , ppt
16	07/06/24	2	Basic Filesystem Operations, Hadoop Filesystems Interfaces, The Java Interface, Reading Data from a Hadoop URL	07/06/24	2	T1, R2	Smart board , ppt
17	08/06/24	3	Reading Data Using the FileSystem API	08/06/24	3	T1, R2	Smart board , ppt
18	13/06/24	Filesystem, Deleting Data Data Flow Anatomy of a File Read, Weather Dataset,Data Format, Analysing					
19	14/06/24						
20	20/06/24						
21	21 and 22	3	<b>CIE-2</b>	21 and 22	3	T1, R2	Smart board , ppt
22	27/06/24	2	Flow, Combiner functions, Running a Distributed	27/06/24	2	T1, R2	Smart board , ppt

23	28/06/24	1,4	The Configuration API, Combining Resources, Variable Expansion,	28/06/24	1,4	T1, R2	Smart board , ppt
24	29/06/24	Generic Options Parser, Tool and Tool Runner, Writing a Unit Test, Mapper, Reducer, Running Locally on Test Data, Running a Job in a Local Job Runner, Testing the Driver, Running on a Cluster, Packaging,				T1, R2	Smart board , ppt
25	04/07/24					T1, R2	Smart board , ppt
26	05/07/24					T1, R2	Smart board , ppt
27	11/07/24	3	MapReduce Web UI, Retrieving the Results	11/07/24	3	T1, R2	Smart board , ppt
28	12/07/24	2	Debugging a Job, Hadoop Logs, Remote	12/07/24	2	T1, R2	Smart board , ppt
29	13/07/24	1,4	Development Environment, Managing Configuration	13/07/24	1,4	T1, R2	Smart board , ppt
30	25 and 26		CIE-3	25 and 26		T1, R2	Smart

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

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- ii) Seminars
- iii) Oral/Online Quizzes
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Sr. No.	CCE Component	Submission due Date
1	Assignment	09/05/24
2	Case Study	12/07/24

#### Text Books:

1. Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications" Wiley
2. Tom White, "Hadoop: The Definitive Guide", 3rd Edition, O'reilly, 2012

#### Reference Book:

1. Chris Eaton, Dirk deRoos et al., "Understanding Big data", McGraw Hill, 2012.
2. Vignesh Prajapati, "Big Data Analytics with R and Hadoop", Packet Publishing 2013.
3. Tom Plunkett, Brian Macdonald et al., "Oracle Big Data Handbook", Oracle Press, 2014



Mangy Anirant  
Faculty

  
HOD  
The Oxford  
Department of MCA  
The Oxford College of Engineering  
Morus Road, BANGALORE -

IOAC



Administrative Office:  
1st Phase JP Nagar, Bengaluru – 560 078  
) : 080-61754501 – 502 Fax: 080-2654 8658

## THE OXFORD COLLEGE OF ENGINEERING

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Bommanahalli, Hosur Road, Bangalore –560068 080 -61754601/602, Fax: 080 – 25730551 E-mail: engprincipal@theoxford.edu Web: www.theoxfordengg.org

### DEPARTMENT OF MASTER OF COMPUTER APPLICATION LESSON PLAN

Faculty Name: ASHOK B P  
Academic Year: 2023-2024  
SubCode & Name: 22MCA414-SOFTWARE PROJECT MANAGEMENT  
Year/Sem/Section: 2/4/A&B

#### COURSE OBJECTIVES This course will enable the students to

- CL01 Apply the practices and methods for successful software project management
- CL02 Identify techniques for requirements, policies and decision making for effective resource management
- CL03 Illustrate the evaluation techniques for estimating cost, benefits, schedule and risk
- CL04 Devise a framework for software project management plan for activities, risk, monitoring and control
- CL05 Design a framework to manage people

#### COURSE OUTCOMES

- CO1 Apply theoretical concepts for projects management
- CO2 Planning for resources allocation with case studies
- CO3 Solving problems related to risk identification, cost based analysis, etc.
- CO4 Managing and working in team
- CO5 Design a framework to manage people

SINo	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the
	Date	Hr		Date	Hr		
1	4/25/2024	2	Introduction to software project management	4/25/2024	2	T1 1 TO 3	Smart board ppt
2	4/26/2024	1	Introduction, Why is Software Project Management important?	4/26/2024	1	T1 4 TO 5	Smart board ppt
3	4/26/2024	3	What is a Project?, Contract Management,	4/26/2024	3	T1 4 TO 5	Smart board ppt
4	4/27/2024	3	Activities Covered by Software Project Management	4/27/2024	3	T1 8 TO 9	Smart board ppt
5	5/2/2024	2	Plans, Methods and Methodologies,	5/2/2024	2	T1 47 TO 66	Smart board ppt
6	5/3/2024	1	Some ways of categorizing software projects, Stakeholders,	5/3/2024	1	T1 47 TO 66	Smart board ppt
7	5/3/2024	3	Setting Objectives Business Case	5/3/2024	3	T1 21 TO 22	Smart board ppt
8	5/9/2024	2	Project Success and Failure, What is Management?	5/9/2024	2	T1 24 TO 25	Smart board ppt

9	5/16/2024	2	Management Control	5/16/2024	2	T1 29 TO 30	Smart board ppt
10	5/17/2024	1	Traditional versus Modern Project Management Practices	5/17/2024	1	T1 32 TO 35	Smart board ppt
11	5/17/2024	3	Project evaluation & finance	5/17/2024	3	T1 41 TO 43	Smart board ppt
12	5/23/2024	2	Evaluation of Individual Projects	5/23/2024	2	T1 126	Smart board ppt
13	5/24/2024	1	Cost Benefit Evaluation Techniques	5/24/2024	1	T1 126 TO 128	Smart board ppt
14	5/24/2024	3	Risk Evaluation, Programme Management	5/24/2024	3	T1 134 TO 135	Smart board ppt
15	5/25/2024	2	Managing allocation of Resources within Programmes	5/25/2024	2	T1 135	Smart board ppt
16	5/30/2024	2	Financial Accounting –An overview	5/30/2024	2	T1 135	Smart board ppt
17	5/31/2024	1	Accounting concepts, Principles & Standards	5/31/2024	1	T1 134	Smart board ppt
18	5/31/2024	3	Ledger posting, Trial balance	5/31/2024	3	T1 145	Smart board ppt
19	6/6/2024	2	Ledger posting, Trial balance	6/6/2024	2	T1 155	Smart board ppt
20	6/7/2024	1	Profit and Loss account Balance sheet	6/7/2024	1	T1 157	Smart board ppt
21	6/7/2024	3	Activity planning	6/7/2024	3	T1 160	Smart board ppt
22	6/8/2024	3	Objectives of Activity Planning	6/8/2024	3	T1 162	Smart board ppt
23	6/13/2024	2	When to Plan, Project Schedules	6/13/2024	2	T1 165	Smart board ppt
24	6/14/2024	1	Sequencing and Scheduling Activities,	6/14/2024	1	T1 202	Smart board ppt
25	6/14/2024	3	Network Planning Models, Forward Pass – Backward Pass	6/14/2024	3	T1 202	Smart board ppt
26	6/20/2024	2	Network Planning Models, Forward Pass – Backward Pass	6/20/2024	2	T1 205	Smart board ppt
27	6/21/2024	1	Identifying critical path, Activity Float Shortening Project Duration	6/21/2024	1	T1 215	Smart board ppt
28	6/21/2024	3	Activity on Arrow Networks	6/21/2024	3	T1 216	Smart board ppt
29	6/22/2024	3	Risk Management, Nature of Risk, Categories of Risk	6/22/2024	3	T1 222	Smart board ppt
30	6/27/2024	2	A framework for dealing with Risk, Risk Identification, Risk analysis and prioritization, risk planning and risk monitoring	6/27/2024	2	T1 233 T1 233	Smart board ppt



6/28/2024	1	Monitoring and control	6/28/2024	1	T1 234	Smart board ppt
6/28/2024	3	Creating the Framework	6/28/2024	3	T1 239	Smart board ppt
6/29/2024	3	Collecting the Data, Review	6/29/2024	3	T1 243	Smart board ppt
7/4/2024	2	Project Termination Review	7/4/2024	2	T1 246	Smart board ppt
7/5/2024	1	Visualizing Progress,	7/5/2024	1	T1 249	Smart board ppt
7/5/2024	3	Cost Monitoring, Earned Value Analysis	7/5/2024	3	T1 249	Smart board ppt
7/11/2024	3	Prioritizing Monitoring	7/11/2024	3	T1 252	Smart board ppt
7/12/2024	1	Getting Project Back To Target	7/12/2024	1	T1 255	Smart board ppt
7/12/2024	3	Change Control	7/12/2024	3	T1 253	Smart board ppt
7/13/2024	3	Software Configuration Management	7/13/2024	3	T1 255	Smart board ppt
7/18/2024	2	MANAGING PEOPLE AND WORKING IN TEAMS	7/18/2024	2	T1 264	Smart board ppt
7/19/2024	1	Introduction, Understanding Behavior	7/19/2024	1	T1 264	Smart board ppt
7/19/2024	3	Organizational Behavior: A Background	7/19/2024	3	T1 265	Smart board ppt
7/25/2024	2	Selecting the Right Person for the Job	7/25/2024	2	T1 268	Smart board ppt
7/26/2024	1	Instruction in the Best Methods,	7/26/2024	1	T1 273	Smart board ppt
7/26/2024	3	Motivation,	7/26/2024	3	T1 284	Smart board ppt
7/27/2024	3	The Oldham –Hackman Job Characteristics Model	7/27/2024	3	T1 285	Smart board ppt

**Continuous and Comprehensive Evaluation (CCE)**

Faculty can choose any two of the following

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations

- xj) Analysis of industry/ technical/business reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

SLNO	CCE Component	Submission due Date
1	Assignment -1	5/31/2024
2	Assignment -2	6/29/2024


**Text Book**

1	BobHughes, MikeCotterell, RajibMall, "Software Project Management", Fifth Edition, TataMcGrawHill,2012.
2	"AccountingforManagement"JawaharLal, 5thEdition, WheelerPublications,Delhi.

**Reference Book**

1	JackMarchewka," Information Technology-Project Management", Wiley Student Version, 4thEdition,2013.
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Faculty

  
HOD-MCA  
The Head  
Department of MCA  
The Oxford College of Engineering,  
Hosur Road, BANGALORE -





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## THE OXFORD COLLEGE OF ENGINEERING

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF MECHANICAL ENGINEERING

#### LESSON PLAN

**Faculty Name: Dr.Varun K R**

**Academic Year: 2023-2024**

**SUB.CODE & Name: BME401 & APPLIED THERMODYNAMICS**

**Year/Sem/Section: 3<sup>rd</sup>/4<sup>th</sup>**

**COURSE OBJECTIVES:** This course will enable the students to  
 CLO1. Explain the air standard cycle and combustion in I. C. Engines.  
 CLO2. Describe the gas power cycle and vapour power cycles.  
 CLO3. Explain the performance of compressor.  
 CLO4. Explain the concepts of Refrigeration and Air conditioning.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Analyze air standard cycle to evaluate the performance of I C engines.
<b>CO2</b>	Analyze the gas power cycles to evaluate the overall efficiency of gas turbine plant.
<b>CO3</b>	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
<b>CO4</b>	Analyze the vapour compression and vapour absorption systems to improve refrigeration.
<b>CO5</b>	Determination of various parameters of air compressors and steam nozzles.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	24/4/24	1 <sup>st</sup>	Air standard cycles: Carnot cycle.	24/4/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
2	24/4/24	5 <sup>th</sup>	Otto Cycle – Efficiency and Mean effective pressure	24/4/24	5 <sup>th</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
3	25/4/24	1 <sup>st</sup>	Diesel Cycle – Efficiency and Mean effective pressure	25/4/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
4	26/4/24	2 <sup>nd</sup>	Dual Cycle – Efficiency and Mean	26/4/24	2 <sup>nd</sup>	Engineering	Chalk and talk

			effective pressure			Thermodynamics, P.K. Nag	method
<b>5</b>	27/4/24	1 <sup>st</sup>	Comparison of Otto and Diesel cycles.	27/4/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>6</b>	2/5/24	1 <sup>st</sup>	Comparison of Otto and Diesel cycles.	2/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>7</b>	3/5/24	2 <sup>nd</sup>	Classification of IC engines	3/5/24	2 <sup>nd</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>8</b>	8/5/24	1 <sup>st</sup>	Combustion of SI engine and CI engine	8/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>9</b>	8/5/24	5 <sup>th</sup>	Detonation and factors affecting detonation	8/5/24	5 <sup>th</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>10</b>	9/5/24	1 <sup>st</sup>	Performance analysis of I.C Engines, Heat balance, Morse test	9/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>11</b>	11/5/24	2 <sup>nd</sup>	Numerical on cycles	11/5/24	2 <sup>nd</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>12</b>	15/5/24	1 <sup>st</sup>	Numerical on engine performance	15/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>13</b>	15/5/24	5 <sup>th</sup>	Gas power Cycles: Gas turbine (Brayton) cycle	15/5/24	5 <sup>th</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>14</b>	16/5/24	1 <sup>st</sup>	Gas power Cycles: Gas turbine (Brayton) cycle	16/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>15</b>	17/5/24	2 <sup>nd</sup>	Gas power Cycles: Gas turbine (Brayton) cycle	17/5/24	2 <sup>nd</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>16</b>	22/5/24	1 <sup>st</sup>	Regenerative, Intercooling and reheating in gas turbine cycles.	22/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>17</b>	22/5/24	5 <sup>th</sup>	Regenerative, Intercooling and reheating in gas turbine cycles.	22/5/24	5 <sup>th</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>18</b>	23/5/24	1 <sup>st</sup>	Regenerative, Intercooling and reheating in gas turbine cycles.	23/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>19</b>	24/5/24	2 <sup>nd</sup>	Numerical on Turbines	24/5/24	2 <sup>nd</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>20</b>	29/5/24	1 <sup>st</sup>	Numerical on Turbines	29/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>21</b>	29/5/24	5 <sup>th</sup>	Numerical on Turbines	29/5/24	5 <sup>th</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>22</b>	30/5/24	1 <sup>st</sup>	Turbojet, Turboprop, Turbofan	30/5/24	1 <sup>st</sup>	Engineering Thermodynamics, P.K. Nag	Chalk and talk method
<b>23</b>	31/5/24	2 <sup>nd</sup>	Ram Jet, Rocket, Pulse Jet,	31/5/24	2 <sup>nd</sup>	Engineering	Chalk and talk

			Ram Rocket.			Thermodynamics, P.K. Nag	method
<b>24</b>	5/6/24	1 <sup>st</sup>	Vapour Power Cycles: Carnot vapour power cycle	5/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>25</b>	5/6/24	5 <sup>th</sup>	drawbacks as a reference cycle.	5/6/24	5 <sup>th</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>26</b>	6/6/24	1 <sup>st</sup>	Simple Rankine cycle; description, T-S diagram, analysis for performance.	6/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>27</b>	7/6/24	2 <sup>nd</sup>	Simple Rankine cycle; description, T-S diagram, analysis for performance.	7/6/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>28</b>	13/6/24	1 <sup>st</sup>	Comparison of Carnot and Rankine cycles.	13/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>29</b>	14/6/24	2 <sup>nd</sup>	Effects of pressure and temperature on Rankine cycle performance.	14/6/24	2 <sup>nd</sup>	Engineering Metrology R.K.	Conduct laboratory demonstrations
<b>30</b>	19/6/24	1 <sup>st</sup>	Effects of pressure and temperature on Rankine cycle performance.	19/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>31</b>	19/6/24	5 <sup>th</sup>	Actual vapour power cycles: Actual vapour power cycles,	19/6/24	5 <sup>th</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>32</b>	20/6/24	1 <sup>st</sup>	regenerative vapour power cycle with open and closed feed water heaters.	20/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>33</b>	21/6/24	2 <sup>nd</sup>	regenerative vapour power cycle with open and closed feed water heaters.	21/6/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>34</b>	22/6/24	1 <sup>st</sup>	Reheat Rankine cycle.	22/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>35</b>	22/6/24	5 <sup>th</sup>	Reheat Rankine cycle.	22/6/24	5 <sup>th</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>36</b>	26/6/24	1 <sup>st</sup>	Refrigeration Cycles: Vapour compression refrigeration system;	26/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>37</b>	26/6/24	5 <sup>th</sup>	description, analysis, refrigerating effect.	26/6/24	5 <sup>th</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>38</b>	27/6/24	1 <sup>st</sup>	Capacity, power required, units of refrigeration, COP	27/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>39</b>	28/6/24	2 <sup>nd</sup>	Refrigerants and their desirable properties	28/6/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>40</b>	29/6/24	1 <sup>st</sup>	alternate Refrigerants.	29/6/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>41</b>	03/7/24	1 <sup>st</sup>	Vapour absorption refrigeration system.	03/7/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
<b>42</b>	03/7/24	5 <sup>th</sup>	Psychrometrics and Air-conditioning Systems: Psychrometric properties of Air	03/7/24	5 <sup>th</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method

43	04/7/24	1 <sup>st</sup>	Psychrometrics and Air-conditioning Systems: Psychrometric properties of Air	04/7/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
44	05/7/24	2 <sup>nd</sup>	Psychrometric Chart, Analyzing Air-conditioning Processes;	05/7/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
45	10/7/24	1 <sup>st</sup>	Heating, Cooling, Dehumidification and Humidification	10/7/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
46	10/7/24	5 <sup>th</sup>	Evaporative Cooling.	10/7/24	5 <sup>th</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
47	11/7/24	1 <sup>st</sup>	Adiabatic mixing of two moist air streams.	11/7/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
48	12/7/24	2 <sup>nd</sup>	Reciprocating Compressors: Operation of a single stage reciprocating compressors	12/7/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
49	13/7/24	2 <sup>nd</sup>	Work input through p-v diagram	13/7/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
50	18/7/24	1 <sup>st</sup>	steady state steady flow analysis.	18/7/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
51	19/7/24	2 <sup>nd</sup>	Effect of Clearance and Volumetric efficiency.	19/7/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
52	24/7/24	1 <sup>st</sup>	wear allowance on gauges, types of gauges- plain plug gauges	24/7/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
53	24/7/24	5 <sup>th</sup>	Adiabatic, Isothermal and Mechanical efficiencies.	24/7/24	5 <sup>th</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
54	25/7/24	1 <sup>st</sup>	Multi-stage compressor,	25/7/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
55	26/7/24	2 <sup>nd</sup>	Optimum intermediate pressure, Inter-cooling,	26/7/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
56	1/8/24	1 <sup>st</sup>	Minimum work for compression.	1/8/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
57	2/8/24	2 <sup>nd</sup>	Steam nozzles: Flow of steam through nozzles,	2/8/24	2 <sup>nd</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
58	7/8/24	1 <sup>st</sup>	Shape of nozzles, effect of friction,	7/8/24	1 <sup>st</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method
59	7/8/24	5 <sup>th</sup>	Critical pressure ratio, Super saturated flow.	7/8/24	5 <sup>th</sup>	Thermodynamics, Yunus A, Cengel	Chalk and talk method

### Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	03/6/24
2	Group Discussion	22/7/24

**Text Books:**

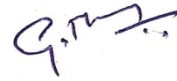
1. Engineering Thermodynamics, P.K. Nag and Lienhard Pearson Education 6thEd.
2. Thermodynamics, Yunus A, Cengel Publishers 2009

**Reference Book:**

1. Thermodynamics for engineers Kenneth A. Kroosand Merle C. Potter, Cengage Learning 2016
2. I.C.Engines, M.L.Mathur & Sharma. Dhanpat Rai & sons-India



**FACULTY**



**HOD**

Professor & Head  
Department of Mechanical Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560068.

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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bangalore – 560 078

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF MECHANICAL ENGINEERING

#### LESSON PLAN

**Faculty Name: Dr. Vidyadhar Pujar**

**Academic Year: 2023-2024**

**SUB.CODE & Name: BME402 & MACHINING SCIENCE & METROLOGY**

**Year/Sem/Section: 2<sup>nd</sup>/4<sup>th</sup>**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To enrich the knowledge pertaining to relative motion and mechanics

CLO2. To introduce students to different machine tools to produce components

CLO3. To develop the knowledge on mechanics of machining process and effect of various parameters on Machining.

CLO4. To understand the basic principles of measurements

CLO5. To enrich the knowledge pertaining to gauge, comparator and angular measurement.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Analyze various cutting parameters in metal cutting.
<b>CO2</b>	Understand the construction of machines & machine tools and compute the machining time of various operations
<b>CO3</b>	Understand the concept of Temperature in Metal Cutting, forms of wear in metal cutting and Cutting fluids
<b>CO4</b>	Understand the objectives of metrology, methods of measurement, standards of measurement & various measurement parameters
<b>CO5</b>	Understand the working principle of different types of comparators, gauges, angular Measurements

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	22/4/24	3RD	Introduction to Metal cutting: Orthogonal and oblique cutting.	22/4/24	3RD	T1	Chalk and talk method for problem-solving
2	23/4/24	4TH	Classification of cutting tools: single, and multipoint	23/4/24	4TH	T1	Chalk and talk method for problem

3	24/4/24	2ND	Tool signature for single point cutting tool. Mechanics	24/4/24	2ND	T1	Chalk and talk method for problem
4	25/4/24	3RD	orthogonal cutting; chip formation	25/4/24	3RD	T1	Chalk and talk method for problem
5	27/4/24	3RD	shear angle and its significance, Merchant circle diagram	27/4/24	3RD	T1	Chalk and talk method for problem
6	29/4/24	4TH	Numerical problems. Cutting tool materials and applications	29/4/24	4TH	T1	Chalk and talk method for problem
7	30/4/24	2ND	Introduction to basic metal cutting machine tools: Lathe- Parts of lathe machine	30/4/24	2ND	T1	Chalk and talk method for problem
8	02/5/24	3RD	accessories of lathe Machine and various operations carried out on lathe	02/5/24	3RD	T1	Chalk and talk method for problem
9	06/5/24	3RD	Kinematics of lathe. Turret and Capstan lathe.	06/5/24	3RD	T1	Chalk and talk method for problem
10	07/5/24	4TH	Milling Machines: up milling & down milling, classification of milling machines	07/5/24	4TH	T1	Chalk and talk method for problem
11	08/5/24	2ND	constructional features and its applications	08/5/24	2ND	T1	Chalk and talk method for problem
12	09/5/24	3RD	Milling cutter nomenclature, various milling operations	09/5/24	3RD	T1	Chalk and talk method for problem
13	11/5/24	3RD	Calculation of machining time.	11/5/24	3RD	T1	Chalk and talk method for problem
14	13/5/24	4TH	Indexing: Need of indexing Simple, compound and	13/5/24	4TH	T1	Conduct laboratory demonstrations
15	14/5/24	2ND	differential indexing calculations	14/5/24	2ND	T1	Conduct laboratory demonstrations
16	15/5/24	3RD	Simple numerical on indexing.	15/5/24	3RD	T1	Conduct laboratory demonstrations
17	16/5/24	3RD	Shaping, Slotting and Planning Machines Tools	16/5/24	3RD	T1	Conduct laboratory demonstrations
18	20/5/24	4TH	Driving mechanisms of Shaper, Slotter and Planer	20/5/24	4TH	T1	Conduct laboratory demonstration

							s
<b>19</b>	21/5/24	2ND	Operations done on Shaper, Planer & Slotter	21/5/24	2ND	T1	Conduct laboratory demonstrations
<b>20</b>	22/5/24	3RD	Difference between shaping and planning operations	22/5/24	3RD	T2	Conduct laboratory demonstrations
<b>21</b>	23/5/24	3RD	Drilling Machines: Constructional features (Radial & Bench drilling Machines), operations	23/5/24	3RD	T2	Conduct laboratory demonstrations
<b>22</b>	25/5/24	4TH	Types of drill & drill bit nomenclature.	25/5/24	4TH	T2	Conduct laboratory demonstrations
<b>23</b>	27/5/24	2ND	Calculation of machining time.	27/5/24	2ND	T2	PPT
<b>24</b>	28/5/24	3RD	Grinding: Grinding operation, classification of grinding processes:	28/5/24	3RD	T2	PPT
<b>25</b>	29/5/24	3RD	cylindrical, surface & centerless grinding	29/5/24	3RD	T2	PPT
<b>26</b>	30/5/24	4TH	Temperature in Metal Cutting: Heat generation in metal cutting	30/5/24	4TH	T2	PPT
<b>27</b>	03/6/24	2ND	temperature distribution in metal cutting	03/6/24	2ND	T2	PPT
<b>28</b>	04/6/24	3RD	effect of cutting speed on temperatures, measurement of cutting temperature	04/6/24	3RD	T2	PPT
<b>29</b>	05/6/24	3RD	Tool life and tool Wear: progressive tool wear	05/6/24	3RD	T2	PPT
<b>30</b>	06/6/24	4TH	forms of wear in metal cutting: crater wear	06/6/24	4TH	T2	PPT
<b>31</b>	08/6/24	2ND	flank wear, tool-life criteria	08/6/24	2ND	T2	Conduct laboratory demonstrations
<b>32</b>	18/6/24	3RD	cutting tool materials: basic requirements of tool materials	18/6/24	3RD	T2	Conduct laboratory demonstrations
<b>33</b>	19/6/24	3RD	major classes of tool materials: high-speed steel, cemented carbide, ceramics	19/6/24	3RD	T2	Conduct laboratory demonstrations
<b>34</b>	20/6/24	4TH	CBN and diamond	20/6/24	4TH	T2	Conduct laboratory demonstrations
<b>35</b>	24/6/24	2ND	tool coatings; the work	24/6/24	2ND	T2	Conduct

			material				laboratory demonstration s
<b>36</b>	25/6/24	3RD	its machinability Cutting fluids	25/6/24	3RD	T2	Conduct laboratory demonstration s
<b>37</b>	26/6/24	3RD	Action of coolants and application of cutting fluids	26/6/24	3RD	T2	Conduct laboratory demonstration s
<b>38</b>	27/6/24	4TH	Introduction: Introduction to metrology & measurements, definition	27/6/24	4TH	T2	PPT
<b>39</b>	29/5/24	2ND	objectives and classification of metrology	29/5/24	2ND	T2	PPT
<b>40</b>	01/7/24	3RD	standards of length- wave length standard, sub division of standards	01/7/24	3RD	T2	PPT
<b>41</b>	02/7/24	3RD	Numerical problems on length calibration.	02/7/24	3RD	T2	PPT
<b>42</b>	03/7/24	4TH	Line & End Standards: Line and end standard	03/7/24	4TH	T2	PPT
<b>43</b>	04/7/24	2ND	slip gauges, wringing phenomena	04/7/24	2ND	T2	PPT
<b>44</b>	08/7/24	3RD	Numerical problems on slip gauges.	08/7/24	3RD	T2	Conduct laboratory demonstration s
<b>45</b>	09/7/24	3RD	numerical problems	09/7/24	3RD	T2	Conduct laboratory demonstration s
<b>46</b>	10/7/24	4TH	numerical problems	10/7/24	4TH	T2	Conduct laboratory demonstration s
<b>47</b>	11/7/24	2ND	Systems of Limits, Fits & Tolerance: Definition of tolerance	11/7/24	2ND	T2	Conduct laboratory demonstration s
<b>48</b>	13/7/24	3RD	tolerance specification in assembly	13/7/24	3RD	T2	Conduct laboratory demonstration s
<b>49</b>	15/7/24	3RD	principle of interchangeability and selective assembly	15/7/24	3RD	T2	Conduct laboratory demonstration s
<b>50</b>	16/7/24	4TH	limits of size advantages and disadvantages	16/7/24	4TH	T2	Conduct laboratory demonstration s
<b>51</b>	18/7/24	2ND	Gauges: Classification of gauges, Taylor's principle, design of GO,	18/7/24	2ND	T2	Conduct laboratory demonstration s

			NO GO gauges				
52	22/7/24	3RD	wear allowance on gauges, types of gauges-plain plug gauges	22/7/24	3RD	T2	PPT
53	23/7/24	3RD	Ring gauges, snap gauge, limit gauge, simple problems.	23/7/24	3RD	T2	PPT
54	24/7/24	4TH	systems of displacement amplification in mechanical comparators	24/7/24	4TH	T2	PPT
54	25/7/24	2ND	Reed type, Sigma comparator, Zeiss ultra-optimizer, Solex air gauge	25/7/24	2ND	T2	PPT
55	27/7/24	3RD	ultrasonic gauges, LVDT	27/7/24	3RD	T2	PPT
56	05/8/24	3RD	Angular Measurements: Bevel protractor, sine	05/8/24	3RD	T2	PPT
57	06/8/24	4TH	numerical on building of angles	06/8/24	4TH	T2	Conduct laboratory demonstrations

### Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	03/6/24
2	Group Discussion	22/7/24

#### Text Books:

1. Mechanical Measurements Beckwith Marangoni and Lienhard Pearson Education 6thEd.
2. Engineering Metrology R.K. Jain Khanna Publishers 2009

#### Reference Book:

1. Mechanical Measurements Beckwith Marangoni and Lienhard Pearson Education 6thEd.
2. A. B. Chattopadhyay, Manufacturing Processes II

Vidyaadhar Pujari

**FACULTY**

G. M. S.

**HOD**

Professor & Head  
Department of Mechanical Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560068.





**CHILDREN'S EDUCATION SOCIETY (Regd.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bangalore – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### **DEPARTMENT OF MECHANICAL ENGINEERING**

#### **LESSON PLAN**

**Faculty Name: Dr.Madhu Sudana Reddy G**

**Academic Year: 2023-2024**

**SUB.CODE & Name: BME405A & NON TRADITIONAL MACHINING**

**Year/Sem/Section:3<sup>rd</sup>/4<sup>th</sup>**

**COURSE OBJECTIVES** This course will enable the students to :

CLO1. To learn various concepts related to modern machining processes & their applications

CLO2. To appreciate the differences between conventional and non-conventional machining processes.

CLO3. To acquire a functional understanding of non-traditional manufacturing equipment.

CLO4. To know about various process parameters and their influence on performance and their applications.

CLO5. To impart knowledge on various types of energy involved in non-traditional machining processes.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Describe non-traditional machining process and compare with Traditional machining process. Recognize the need for Non-traditional machining process.
<b>CO2</b>	Describe the constructional features, performance parameters, process characteristics, applications, advantages, and limitations of USM, AJM and WJM.
<b>CO3</b>	Characterize the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages, and limitations.
<b>CO4</b>	Illustrate the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM

### Continuous and Comprehensive Evaluation (CCE)

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	22/4/24	2 <sup>nd</sup>	Module 1 : Introduction to Non-traditional machining Introduction to Non-traditional machining	22/4/24	2 <sup>nd</sup>	Modern Machining Process by P.C Pandey and H S Shah, McGraw Hill Education India Pvt. Ltd. 2000	Chalk and talk method for problem solving
2	22/4/24	2 <sup>nd</sup>	Need for Non-traditional machining process, Comparison between traditional and non-traditional machining, general classification	22/4/24	2 <sup>nd</sup>	Modern Machining Process by P.C Pandey and H S Shah, McGraw Hill Education India Pvt. Ltd. 2000	Chalk and talk method for problem solving
3	24/4/24	6 <sup>th</sup>	Non-traditional machining processes, classification based on nature of energy employed in machining, selection of non-traditional machining processes,	24/4/24	6 <sup>th</sup>	Modern Machining Process by P.C Pandey and H S Shah, McGraw Hill Education India Pvt. Ltd. 2000	Chalk and talk method for problem solving
4	29/4/24	2 <sup>nd</sup>	Specific advantages, limitations and applications of non-traditional machining processes.	24/4/24	6 <sup>th</sup>	Modern Machining Process by P.C Pandey and H S Shah, McGraw Hill Education India Pvt. Ltd. 2000	Chalk and talk method for problem solving

5	30/4/24	3 <sup>rd</sup>	Module 2 : Ultrasonic Machining (USM): Introduction, Equipment and material process,	30/4/24	3 <sup>rd</sup>	Wellar, E.J. "NTM Machining Processes", Society of Manufacturing Engineers Publications, 2nd Edition, Michigan,1984	Chalk and talk method for problem solving
6	03/5/24	1 <sup>st</sup>	Effect of process parameters: Effect of amplitude and frequency,	03/5/24	1 <sup>st</sup>	Wellar, E.J. "NTM Machining Processes", Society of Manufacturing Engineers Publications, 2nd Edition, Michigan,1984	Chalk and talk method for problem solving
7	06/5/24	2 <sup>nd</sup>	Effect of abrasive grain diameter, effect of slurry, tool & work material	03/5/24	1 <sup>st</sup>	Wellar, E.J. "NTM Machining Processes", Society of Manufacturing Engineers Publications, 2nd Edition, Michigan,1984	Chalk and talk method for problem solving
8	07/5/24	3 <sup>rd</sup>	Process characteristics: Material removal rate, tool wear, accuracy, surface finish,	07/5/24	3 <sup>rd</sup>	Wellar, E.J. "NTM Machining Processes", Society of Manufacturing Engineers Publications, 2nd Edition, Michigan,1984	Chalk and talk method for problem solving

9	08/5/24	6 <sup>th</sup>	applications, advantages & limitations of USM.	08/5/24	6 <sup>th</sup>	Wellar, E.J. "NTM Machining Processes", Society of Manufacturing Engineers Publications, 2nd Edition, Michigan, 1984	Chalk and talk method for problem solving
10	11/5/24	1 <sup>st</sup>	Abrasive Jet Machining (AJM): Introduction, Equipment and process of material removal	11/5/24	1 <sup>st</sup>	NTM Processes, by Gary F /Taylor & Francis	Chalk and talk method for problem solving
11	13/5/24	2 <sup>nd</sup>	process variables: carrier gas, type of abrasive,	13/5/24	2 <sup>nd</sup>	NTM Processes, by Gary F /Taylor & Francis	Chalk and talk method for problem solving
12	14/5/24	3 <sup>rd</sup>	work material, stand-off distance (SOD).	14/5/24	3 <sup>rd</sup>	NTM Processes, by Gary F /Taylor & Francis	Chalk and talk method for problem solving
13	15/5/24	6 <sup>th</sup>	Process characteristics- Material removal rate, Nozzle wear, accuracy & surface finish.	15/5/24	6 <sup>th</sup>	NTM Processes, by Gary F /Taylor & Francis	Chalk and talk method for problem solving
14	17/5/24	1 <sup>st</sup>	Applications, advantages & limitations of AJM.	17/5/24	1 <sup>st</sup>	NTM Processes, by Gary F /Taylor & Francis	Chalk and talk method for problem solving
15	20/5/24	2 <sup>nd</sup>	Module 3 : Electrochemical machining(ECM):Introduction, Principle of electro chemical machining	20/5/24	2 <sup>nd</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
16	21/5/24	3 <sup>rd</sup>	ECM equipment, elements of ECM operation, Chemistry of ECM	21/5/24	3 <sup>rd</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
17	22/5/24	6 <sup>th</sup>	ECM Process characteristics: Material removal rate, accuracy, surface finish	22/5/24	6 <sup>th</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
18	24/5/24	1 <sup>st</sup>	Process parameters: Current density, Tool feed rate	24/5/24	1 <sup>st</sup>	NTM Processes, by Gary F /Taylor	Adopt collaborative (Group

						& Francis	Learning) learning
19	25/5/24	2 <sup>nd</sup>	Gap between tool & work piece, velocity of electrolyte flow, type of electrolyte,	25/5/24	2 <sup>nd</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
20	27/5/24	2 <sup>nd</sup>	its concentration temperature, and choice of electrolytes	27/5/24	2 <sup>nd</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
21	28/5/24	3 <sup>rd</sup>	ECM Tooling: ECM tooling technique & example, Tool & insulation materials.	28/5/24	3 <sup>rd</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
22	29/5/24	6 <sup>th</sup>	Applications ECM: Electrochemical grinding and electrochemical honing process.	29/5/24	6 <sup>th</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
23	31/5/24	1 <sup>st</sup>	Advantages, disadvantages and application of ECG, ECH.	31/5/24	1 <sup>st</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
24	03/6/24	2 <sup>nd</sup>	Chemical Machining (CHM): Elements of the process, Resists (maskants), Etchants	03/6/24	2 <sup>nd</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
25	04/6/24	3 <sup>rd</sup>	Types of chemical machining process-chemical blanking process, chemical milling process.	04/6/24	3 <sup>rd</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.



26	05/5/24	6 <sup>th</sup>	Process characteristics of CHM: material removal rate, accuracy,	05/5/24	6 <sup>th</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
27	07/6/24	1 <sup>st</sup>	surface finish, advantages, limitations and applications of chemical machining process.	07/6/24	1 <sup>st</sup>	NTM Processes, by Gary F /Taylor & Francis	Adopt collaborative (Group Learning) learning in the class.
28	08/6/24	3 <sup>rd</sup>	Module 4 : Electrical Discharge Machining (EDM):	08/6/24	3 <sup>rd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
29	14/6/24	1 <sup>st</sup>	Introduction, mechanism of metal removal,	14/6/24	1 <sup>st</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
30	18/6/24	3 <sup>rd</sup>	EDM equipment: spark erosion generator (relaxation type), dielectric medium-its functions	18/6/24	3 <sup>rd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
31	19/6/24	6 <sup>th</sup>	desirable properties, electrode feed control system.	19/6/24	6 <sup>th</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
32	21/6/24	1 <sup>st</sup>	Flushing types; pressure flushing, suction flushing, side flushing, pulsed flushing.	21/6/24	1 <sup>st</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
33	22/6/24	6 <sup>th</sup>	EDM process parameters: Spark frequency, current & spark gap, surface finish,	22/6/24	6 <sup>th</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
34	24/6/24	2 <sup>nd</sup>	Heat Affected Zone. Advantages, limitations	24/6/24	2 <sup>nd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
35	25/6/24	3 <sup>rd</sup>	applications of EDM, Electrical discharge grinding, Traveling wire EDM.	25/6/24	3 <sup>rd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving

36	26/6/24	6 <sup>th</sup>	Plasma Arc Machining (PAM): Introduction non-thermal generation of plasma	26/6/24	6 <sup>th</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
37	28/6/24	1 <sup>st</sup>	equipment mechanism of metal removal	28/6/24	1 <sup>st</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
38	01/7/24	2 <sup>nd</sup>	Plasma torch, process parameters, process characteristics.	01/7/24	2 <sup>nd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
39	02/7/24	3 <sup>rd</sup>	Safety precautions. Safety precautions, applications, advantages and limitations.	02/7/24	3 <sup>rd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
40	03/7/24	6 <sup>th</sup>	Module 5 : Laser Beam Machining (LBM): Introduction, generation of LASER	03/7/24	6 <sup>th</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
41	05/7/24	1 <sup>st</sup>	Equipment and mechanism of metal removal	05/7/24	1 <sup>st</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
42	08/7/24	2 <sup>nd</sup>	Laser Beam Machining parameters	08/7/24	2 <sup>nd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
43	09/7/24	3 <sup>rd</sup>	Laser Beam Machining characteristics,	09/7/24	3 <sup>rd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
44	10/7/24	6 <sup>th</sup>	Laser Beam Machining Applications, Advantages & limitations.	10/7/24	6 <sup>th</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
45	12/7/24	1 <sup>st</sup>	ElectronBeam Machining (EBM) :	12/7/24	1 <sup>st</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
46	13/7/24	1 <sup>st</sup>	Introduction to EBM	13/7/24	1 <sup>st</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving

47	15/7/24	2 <sup>nd</sup>	Principle and equipment of EBM	15/7/24	2 <sup>nd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method
48	16/7/24	3 <sup>rd</sup>	mechanism of metal removal	16/7/24	3 <sup>rd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
49	19/7/24	1 <sup>st</sup>	Applications of EBM	19/7/24	1 <sup>st</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
50	22/7/24	2 <sup>nd</sup>	advantages and limitations of EBM	22/7/24	2 <sup>nd</sup>	Modern Machining process, Aditya, 2002.	Chalk and talk method for problem solving
51	23/7/24	3 <sup>rd</sup>	Revision	23/7/24	3 <sup>rd</sup>		Chalk and talk method for problem solving
52	24/7/24	6 <sup>th</sup>	Revision	24/7/24	6 <sup>th</sup>		Chalk and talk method for problem solving
53	26/7/24	1 <sup>st</sup>	Revision	26/7/24	1 <sup>st</sup>		Chalk and talk method for problem solving
54	27/7/24	2 <sup>nd</sup>	Revision	27/7/24	2 <sup>nd</sup>		Chalk and talk method for problem solving
55	01/8/24	3 <sup>rd</sup>	Revision	01/8/24	3 <sup>rd</sup>		Chalk and talk method for problem solving
56	02/8/24	1 <sup>st</sup>	Revision	02/8/24	1 <sup>st</sup>		Chalk and talk method for problem solving
57	05/8/24	2 <sup>nd</sup>	Revision	05/8/24	2 <sup>nd</sup>		Chalk and talk method for problem solving

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	Assignments ( Individual / or Group ) 1	<b>03/06/2024</b>
2	Assignments ( Individual / or Group ) 2	<b>15/07/2024</b>

**Text Books:**


- 1.Modern Machining Process by P.C Pandey and H S Shah, McGraw Hill Education India Pvt. Ltd. 2000.
- 2.Wellar, E.J. "Non-Traditional Machining Processes", Society of Manufacturing Engineers. Publications, 2nd Edition, Michigan, 1984.
- 3.Non Traditional Manufacturing Processes, by Gary F Benedict, Taylor & Francis.

**Reference Book:**

1. Production technology, HMT, McGraw Hill Education India Pvt. Ltd. 2001.
2. Modern Machining process, Aditya, 2002.



**Faculty**



**HOD**

Professor & Head  
Department of Mechanical Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560068.



CHILDREN'S EDUCATION SOCIETY (Regd.)

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bangalore – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## THE OXFORD COLLEGE OF ENGINEERING

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF MECHANICAL ENGINEERING

#### LESSON PLAN

**Faculty Name: Dr. Varun K R**

**Academic Year: 2023-2024**

**SUB.CODE & Name: 21ME62 & Heat Transfer**

**Year/Sem/Section: 3<sup>rd</sup>/4<sup>th</sup>**

**COURSE OBJECTIVES:** This course will enable the students to

CLO1. Principles of heat transfer.

CLO2. Steady and transient heat transfer, obtain the differential equation of heat conduction in various coordinate system.

CLO3. Physical mechanism of convection and visualize the development of velocity and thermal boundary layers during flow over a surface.

CLO4. Radiation heat transfer mechanism

CLO5. The mechanisms of boiling and condensation and understand performance parameters of heat exchangers.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Solve steady state heat transfer problems in conduction.
<b>CO2</b>	Solve transient heat transfer problems
<b>CO3</b>	Solve radiation heat transfer problems
<b>CO4</b>	solve convection heat transfer problems using correlations
<b>CO5</b>	Explain the mechanisms of boiling and condensation. And Determine performance parameters of heat exchangers.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	29/4	5 <sup>th</sup>	Introductory Concepts and definition: Review of basics of Modes of Heat Transfer	29/4	5 <sup>th</sup>	T1	Chalk and talk method
2	30/4	3 <sup>rd</sup>	Boundary conditions of first, second and third kinds	30/4	3 <sup>rd</sup>	T1	Chalk and talk method



<b>3</b>	2/5	3 <sup>rd</sup>	Steady state conduction in slab	2/5	3 <sup>rd</sup>	T1	Chalk and talk method
<b>4</b>	3/5	4 <sup>th</sup>	Steady state conduction in cylinder	3/5	4 <sup>th</sup>	T1	Chalk and talk method
<b>5</b>	6/5	5 <sup>th</sup>	Steady state conduction in sphere	6/5	5 <sup>th</sup>	T1	Chalk and talk method
<b>6</b>	7/5	3 <sup>rd</sup>	Numerical on conduction	7/5	3 <sup>rd</sup>	T1	Chalk and talk method
<b>7</b>	8/5	2 <sup>nd</sup>	Numerical on conduction	8/5	2 <sup>nd</sup>	T1	Chalk and talk method
<b>8</b>	13/5	5 <sup>th</sup>	Overall heat transfer coefficient for a composite medium; thermal contact resistance	13/5	5 <sup>th</sup>	T1	Chalk and talk method
<b>9</b>	14/5	3 <sup>rd</sup>	critical thickness of insulation	14/5	3 <sup>rd</sup>	T1	Chalk and talk method
<b>10</b>	15/5	2 <sup>nd</sup>	Numerical on critical thickness of insulation	15/5	2 <sup>nd</sup>	T1	Chalk and talk method
<b>11</b>	17/5	4 <sup>th</sup>	Steady state conduction in fins of uniform cross section long fin, fin efficiency & effectiveness	17/5	4 <sup>th</sup>	T1	Chalk and talk method
<b>12</b>	20/5	5 <sup>th</sup>	Steady state conduction in fins of uniform cross section fin with insulated tip, fin efficiency & effectiveness	20/5	5 <sup>th</sup>	T1	Chalk and talk method
<b>13</b>	21/5	3 <sup>rd</sup>	Steady state conduction in fins of uniform cross section fin with convection at the tip, fin efficiency & effectiveness	21/5	3 <sup>rd</sup>	T1	Chalk and talk method
<b>14</b>	22/5	2 <sup>nd</sup>	Numerical on fins	22/5	2 <sup>nd</sup>	T1	Chalk and talk method
<b>15</b>	24/5	4 <sup>th</sup>	Numerical on fins	24/5	4 <sup>th</sup>	T1	Chalk and talk method
<b>16</b>	25/5	5 <sup>th</sup>	Conduction in solids with negligible internal temperature gradients (lumped system analysis)	25/5	5 <sup>th</sup>	T1	Chalk and talk method
<b>17</b>	27/5	5 <sup>th</sup>	Use of transient temperature charts (Heisler's charts) for Transient conduction in slab, long cylinder and sphere;	27/5	5 <sup>th</sup>	T1	Chalk and talk method
<b>18</b>	28/5	3 <sup>rd</sup>	concept of semi-infinite solids	28/5	3 <sup>rd</sup>	T1	Chalk and talk method
<b>19</b>	29/5	2 <sup>nd</sup>	Numerical on transient conduction	29/5	2 <sup>nd</sup>	T1	Chalk and talk method
<b>20</b>	31/5	4 <sup>th</sup>	Numerical on transient conduction	31/5	4 <sup>th</sup>	T1	Chalk and talk method
<b>21</b>	7/6	4 <sup>th</sup>	Numerical Analysis of Heat Conduction: Introduction	7/6	4 <sup>th</sup>	T2	Chalk and talk method
<b>22</b>	8/6	3 <sup>rd</sup>	1D steady conduction and 1D unsteady conduction	8/6	3 <sup>rd</sup>	T2	Chalk and talk method

23	10/6	5 <sup>th</sup>	Boundary conditions, and solution methods.	10/6	5 <sup>th</sup>	T2	Chalk and talk method
24	11/6	3 <sup>rd</sup>	Intensity of radiation and solid angle	11/6	3 <sup>rd</sup>	T2	Chalk and talk method
25	12/6	2 <sup>nd</sup>	Concept of thermal radiation resistance, Radiation network	12/6	2 <sup>nd</sup>	T2	Chalk and talk method
26	14/6	4 <sup>th</sup>	view factor, Radiation heat exchange between two parallel infinite black surfaces	14/6	4 <sup>th</sup>	T2	Chalk and talk method
27	18/6	3 <sup>rd</sup>	between two parallel infinite gray surfaces; Effect of radiation shield	18/6	3 <sup>rd</sup>	T2	Chalk and talk method
28	19/6	2 <sup>nd</sup>	Discussion on engineering applications	19/6	2 <sup>nd</sup>	T2	Chalk and talk method
29	21/6	4 <sup>th</sup>	Numerical on radiations	21/6	4 <sup>th</sup>	T2	Conduct laboratory demonstrations
30	22/6	2 <sup>nd</sup>	Numerical on radiations	22/6	2 <sup>nd</sup>	T2	Chalk and talk method
31	24/6	5 <sup>th</sup>	Flow over a flat plate - Velocity boundary layer, Thermal boundary layer	24/6	5 <sup>th</sup>	T2	Chalk and talk method
32	25/6	3 <sup>rd</sup>	general expression for local heat transfer coefficient; Average heat transfer coefficient.	25/6	3 <sup>rd</sup>	T2	Chalk and talk method
33	26/6	2 <sup>nd</sup>	Physical significance of Dimensionless numbers.	26/6	2 <sup>nd</sup>	T2	Chalk and talk method
34	28/6	4 <sup>th</sup>	Use of various Correlations for hydro dynamically and thermally developed flows	28/6	4 <sup>th</sup>	T2	Chalk and talk method
35	1/7	5 <sup>th</sup>	Use of correlations for flow over a flat plate	1/7	5 <sup>th</sup>	T2	Chalk and talk method
36	2/7	3 <sup>rd</sup>	Use of correlations for flow over a cylinder, sphere and flow inside the duct.	2/7	3 <sup>rd</sup>	T2	Chalk and talk method
37	8/7	5 <sup>th</sup>	Physical significance of dimensionless numbers.	8/7	5 <sup>th</sup>	T2	Chalk and talk method
38	9/7	3 <sup>rd</sup>	Physical significance of dimensionless numbers.	9/7	3 <sup>rd</sup>	T2	Chalk and talk method
39	10/7	2 <sup>nd</sup>	Use of correlations for free convection from or to vertical, horizontal	10/7	2 <sup>nd</sup>	T2	Chalk and talk method
40	12/7	4 <sup>th</sup>	inclined flat plates, vertical and inclined cylinder	12/7	4 <sup>th</sup>	T2	Chalk and talk method
41	13/7	4 <sup>th</sup>	Film, dropwise condensation theory	13/7	4 <sup>th</sup>	T2	Chalk and talk method
42	15/7	5 <sup>th</sup>	Pool boiling regimes,	15/7	5 <sup>th</sup>	T2	Chalk and talk method

43	16/7	3 <sup>rd</sup>	Use of correlations for film and Drop wise condensation on tubes.	16/7	3 <sup>rd</sup>	T2	Chalk and talk method
44	19/7	4 <sup>th</sup>	Classification of heat exchangers	19/7	4 <sup>th</sup>	T2	Chalk and talk method
45	22/7	5 <sup>th</sup>	Overall heat transfer coefficient, Fouling, Scaling factors	22/7	5 <sup>th</sup>	T2	Chalk and talk method
46	23/7	3 <sup>rd</sup>	LMTD and NTU methods of analysis of heat exchangers	23/7	3 <sup>rd</sup>	T2	Chalk and talk method
47	24/7	2 <sup>nd</sup>	LMTD and NTU methods of analysis of heat exchangers	24/7	2 <sup>nd</sup>	T2	Chalk and talk method
48	29/7	5 <sup>th</sup>	Numerical on Heat exchangers	29/7	5 <sup>th</sup>	T2	Chalk and talk method
49	30/7	3 <sup>rd</sup>	Numerical on Heat exchangers	30/7	3 <sup>rd</sup>	T2	Chalk and talk method
50	31/7	2 <sup>nd</sup>	Numerical on Heat exchangers	31/7	2 <sup>nd</sup>	T2	Chalk and talk method

### Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	03/6/24
2	Group Discussion	22/7/24

#### Text Books:

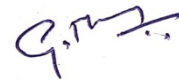
1. Principals of heat transfer Frank Kreith, Raj M. Manglik, Mark S. Bohn Cengage learning Seventh Edition 2011.
2. Heat transfer, a practical approach Yunus A. Cengel Tata Mc Graw Hill Fifth edition

#### Reference Book:

1. Heat Transfer A Basic Approach M. Necati Ozisik McGraw Hill, New York 2005
2. Heat Transfer Holman, J. P. Tata McGraw Hill, New York 9th Edition 2008



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Professor & Head  
Department of Mechanical Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560068.



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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bangalore – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF MECHANICAL ENGINEERING

#### LESSON PLAN

**Faculty Name: Dr. Prasad H Nayak**

**Academic Year: 2023-2024**

**SUB.CODE & Name: 21ME63 & Machine Design**

**Year/Sem/Section: 3<sup>rd</sup>/6<sup>th</sup>**

**COURSE OBJECTIVES:** This course will enable the students to

CLO1. To explain the principles involved in design of machine elements, subjected to different kinds of forces, from the considerations of strength, rigidity.

CLO2. To understand and interpret different failure modes and application of appropriate criteria for design of machine elements.

CLO3. Develop the capability to design elements like shafts, couplings and springs, welded joints, screwed joints

CLO4. To learn transmission elements like gears, belts, pulleys, bearings from the manufacturers' catalogue.

CLO5. To produce assembly and working drawings of various mechanical systems involving machine elements like clutches and brakes

#### **COURSE OUTCOMES:**

<b>CO1</b>	Apply codes and standards in the design of machine elements and select an element based on the Manufacturer's catalogue.
<b>CO2</b>	Analyse the performance and failure modes of mechanical components subjected to combined loading and fatigue loading using the concepts of theories of failure.
<b>CO3</b>	Demonstrate the application of engineering design tools to the design of machine components like shafts, springs, couplings, fasteners, welded and riveted joints, brakes and clutches
<b>CO4</b>	Design different types of gears and simple gear boxes for relevant applications.
<b>CO5</b>	Apply design concepts of hydrodynamic bearings for different applications and select Anti friction bearings for different applications using the manufacturers, catalogue.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		

<b>1</b>	29/4	4 <sup>th</sup>	Introduction and Review: Review of engineering materials and their properties and manufacturing processes	29/4	4 <sup>th</sup>	T1	Chalk and talk method
<b>2</b>	30/4	3 <sup>rd</sup>	Use of codes and standards, selection of preferred sizes	30/4	3 <sup>rd</sup>	T1	Chalk and talk method
<b>3</b>	2/5	2 <sup>nd</sup>	Review of axial, bending, shear and torsion loading on machine components, combined loading, two- and three dimensional stresses	2/5	2 <sup>nd</sup>	T1	Chalk and talk method
<b>4</b>	3/5	1 <sup>st</sup>	Principal stresses, stress tensors, Mohr's circles	3/5	1 <sup>st</sup>	T1	Chalk and talk method
<b>5</b>	6/5	4 <sup>th</sup>	Design for static strength: Factor of safety and service factor	6/5	4 <sup>th</sup>	T1	Chalk and talk method
<b>6</b>	7/5	3 <sup>rd</sup>	Failure mode: definition and types. , Failure of brittle and ductile materials	7/5	3 <sup>rd</sup>	T1	Chalk and talk method
<b>7</b>	8/5	2 <sup>nd</sup>	Even and uneven materials; Theories of failure: maximum normal stress theory	8/5	2 <sup>nd</sup>	T1	Chalk and talk method
<b>8</b>	13/5	1 <sup>st</sup>	Maximum shear stress theory, distortion energy theory	13/5	1 <sup>st</sup>	T1	Chalk and talk method
<b>9</b>	14/5	4 <sup>th</sup>	Strain energy theory, Columba – Mohr theory and modified Mohr's theory	14/5	4 <sup>th</sup>	T1	Chalk and talk method
<b>10</b>	15/5	3 <sup>rd</sup>	Stress concentration, stress concentration factor	15/5	3 <sup>rd</sup>	T1	Chalk and talk method
<b>11</b>	17/5	2 <sup>nd</sup>	Impact Strength: Introduction, Impact stresses due to axial	17/5	2 <sup>nd</sup>	T1	Chalk and talk method
<b>12</b>	20/5	1 <sup>st</sup>	Bending and torsion loads	20/5	1 <sup>st</sup>	T1	Chalk and talk method
<b>13</b>	21/5	4 <sup>th</sup>	Fatigue loading: Introduction to fatigue failure, Mechanism of fatigue failure	21/5	4 <sup>th</sup>	T1	Chalk and talk method
<b>14</b>	22/5	3 <sup>rd</sup>	Types of fatigue loading, S-N Diagram	22/5	3 <sup>rd</sup>	T1	Chalk and talk method
<b>15</b>	24/5	2 <sup>nd</sup>	Low cycle fatigue, High cycle fatigue, Endurance limit.	24/5	2 <sup>nd</sup>	T1	Chalk and talk method
<b>16</b>	25/5	1 <sup>st</sup>	Design of shafts: Torsion of shafts, solid and hollow shaft design with steady loading based on strength and rigidity	25/5	1 <sup>st</sup>	T1	Chalk and talk method
<b>17</b>	27/5	4 <sup>th</sup>	ASME and BIS codes for power transmission shafting, design of shafts subjected to combined bending	27/5	4 <sup>th</sup>	T1	Chalk and talk method
<b>18</b>	28/5	3 <sup>rd</sup>	Torsion and axial loading, Discussion on engineering applications.	28/5	3 <sup>rd</sup>	T1	Chalk and talk method



19	29/5	2 <sup>nd</sup>	Design of couplings: Design of Flange coupling, and Bush and Pin type coupling.	29/5	2 <sup>nd</sup>	T1	Chalk and talk method
20	31/5	1 <sup>st</sup>	Springs: Types of springs, spring materials, stresses in helical coil springs of circular and non-circular cross sections	31/5	1 <sup>st</sup>	T1	Chalk and talk method
21	7/6	4 <sup>th</sup>	Tension and compression springs, concentric springs	7/6	4 <sup>th</sup>	T2	Chalk and talk method
22	8/6	3 <sup>rd</sup>	Springs under fluctuating loads. Leaf Springs: Stresses in leaf springs	8/6	3 <sup>rd</sup>	T2	Chalk and talk method
23	10/6	2 <sup>nd</sup>	Equalized stresses, and nipping of leaf springs, Discussion on engineering applications.	10/6	2 <sup>nd</sup>	T2	Chalk and talk method
24	11/6	1 <sup>st</sup>	Riveted joints: Types of rivets, rivet materials, Caulking and fullering, analysis of riveted joints	11/6	1 <sup>st</sup>	T2	Chalk and talk method
25	12/6	4 <sup>th</sup>	Joint efficiency, failures of riveted joints, boiler joints	12/6	4 <sup>th</sup>	T2	Chalk and talk method
26	14/6	3 <sup>rd</sup>	Riveted brackets, Discussion on engineering applications	14/6	3 <sup>rd</sup>	T2	Chalk and talk method
27	18/6	2 <sup>nd</sup>	Welded joints: Types, strength of butt and fillet welds, eccentrically loaded welded joints, Discussion on engineering applications.	18/6	2 <sup>nd</sup>	T2	Chalk and talk method
28	19/6	1 <sup>st</sup>	Threaded Fasteners: Stresses in threaded fasteners, effect of initial tension	19/6	1 <sup>st</sup>	T2	Chalk and talk method
29	21/6	4 <sup>th</sup>	Design of threaded fasteners under static, dynamic and impact loads	21/6	4 <sup>th</sup>	T2	Conduct laboratory demonstrations
30	22/6	3 <sup>rd</sup>	Design of eccentrically loaded bolted joints, Discussion on engineering applications.	22/6	3 <sup>rd</sup>	T2	Chalk and talk method
31	24/6	2 <sup>nd</sup>	Spur Gears: Definitions, stresses in gear tooth: Lewis equation and form factor, design for strength, dynamic load and wear.	24/6	2 <sup>nd</sup>	T2	Chalk and talk method
32	25/6	1 <sup>st</sup>	Helical Gears: Definitions, transverse and normal module, formative number of teeth, design based on strength, dynamic load and wear.	25/6	1 <sup>st</sup>	T2	Chalk and talk method
33	26/6	4 <sup>th</sup>	Bevel Gears: Definitions, formative number of teeth, design based on strength,	26/6	4 <sup>th</sup>	T2	Chalk and talk method

			dynamic load and wear				
<b>34</b>	28/6	3 <sup>rd</sup>	Worm Gears: Definitions, types of worm and worm gears, and materials for worm and worm wheel	28/6	3 <sup>rd</sup>	T2	Chalk and talk method
<b>35</b>	1/7	2 <sup>nd</sup>	Design based on strength, dynamic, wear loads and efficiency of worm gear drives.	1/7	2 <sup>nd</sup>	T2	Chalk and talk method
<b>36</b>	2/7	1 <sup>st</sup>	Design of Clutches and Brakes: Design of single plate, multi-plate and cone clutches based on uniform pressure and uniform wear theories	2/7	1 <sup>st</sup>	T2	Chalk and talk method
<b>37</b>	8/7	4 <sup>th</sup>	Design of band brakes, block brakes and internal expanding brakes	8/7	4 <sup>th</sup>	T2	Chalk and talk method
<b>38</b>	9/7	3 <sup>rd</sup>	Lubrication and Bearings: Lubricants and their properties, bearing materials and properties	9/7	3 <sup>rd</sup>	T2	Chalk and talk method
<b>39</b>	10/7	2 <sup>nd</sup>	Mechanisms of lubrication, hydrodynamic lubrication, pressure development in oil film, bearing modulus, coefficient of friction	10/7	2 <sup>nd</sup>	T2	Chalk and talk method
<b>40</b>	12/7	1 <sup>st</sup>	Minimum oil film thickness, heat generated, and heat dissipated.	12/7	1 <sup>st</sup>	T2	Chalk and talk method
<b>41</b>	13/7	4 <sup>th</sup>	Antifriction bearings: Types of rolling contact bearings and their applications	13/7	4 <sup>th</sup>	T2	Chalk and talk method
<b>42</b>	15/7	3 <sup>rd</sup>	Static and dynamic load carrying capacities	15/7	3 <sup>rd</sup>	T2	Chalk and talk method
<b>43</b>	16/7	2 <sup>nd</sup>	Equivalent bearing load, load life relationship	16/7	2 <sup>nd</sup>	T2	Chalk and talk method
<b>44</b>	19/7	1 <sup>st</sup>	Discussion on engineering applications	19/7	1 <sup>st</sup>	T2	Chalk and talk method
<b>45</b>	22/7	4 <sup>th</sup>	Numericals	22/7	4 <sup>th</sup>	T2	Chalk and talk method
<b>46</b>	23/7	3 <sup>rd</sup>	Numericals	23/7	3 <sup>rd</sup>	T2	Chalk and talk method
<b>47</b>	24/7	2 <sup>nd</sup>	Numericals	24/7	2 <sup>nd</sup>	T2	Chalk and talk method
<b>48</b>	29/7	1 <sup>st</sup>	Numericals	29/7	1 <sup>st</sup>	T2	Chalk and talk method
<b>49</b>	30/7	4 <sup>th</sup>	Revision of VTU old question paper	30/7	4 <sup>th</sup>	T2	Chalk and talk method
<b>50</b>	31/7	3 <sup>rd</sup>	Revision of VTU old question paper	31/7	3 <sup>rd</sup>	T2	Chalk and talk method

## Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	03/6/24
2	Assignment	22/7/24

### Text Books:

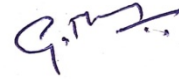
- 1 Shigley's Mechanical Engineering Design Richard G. Budynas, and J. Keith Nisbett McGraw-Hill Education 10th Edition, 2015
- 2 Fundamentals of Machine Component Design Juvinall R.C, and Marshek K.M John Wiley & Sons Third Edition 2007 Wiley student edition
- 3 Design of Machine Elements V. B. Bhandari Tata Mcgraw Hill 4th Ed 2016.

### Reference Book:

- 1 Machine Design- an integrated approach Robert L. Norton Pearson Education 2nd edition
- 2 Design and Machine Elements Spotts M.F., Shoup T.E Pearson Education 8th edition, 2006
- 3 Machine design Hall, Holowenko, Laughlin (Schaum's Outline Series adapted by S.K.Somani Tata McGraw Hill 110 110 Publishing Company Ltd Special Indian Edition, 2008
- 4 Elements of Machine Design H.G.Patil, S.C.Pilli, R.R.Malagi, M.S.Patil IK International First edition, 2019
- 5 Hand book of Mechanical Design G. M. Maithra and L.V.Prasad Tata McGraw Hill 2nd edition, 2004



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Administrative Office:

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**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 15/11/23 to 20/2/24**

**SUB.CODE & Name: MECHANICS OF SOLIDS AND FLUIDS 21MT34**

**Year/Sem/Section: 2<sup>ND</sup> / 3<sup>RD</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Gain knowledge of linear elastic properties and stress strain relations.

CLO2. Derive and solve problems on Principal stresses developed in structures.

CLO3. Compute the stress strain for bars, beams, shafts, and column and to apply the concept of dynamic similarity and to apply it to experimental modelling.

CLO4. Gain knowledge of basic properties of fluids, fluid statics.

CLO5: To apply conservation of mass, momentum and energy equation.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain the knowledge of properties, and stress-strain relations in linear elastic solid members and fluids. To understand the concepts of fluid statics, kinematics and dynamics.
<b>CO2</b>	Describe stress-strain equation for axial, bending and torsion loads while addressing problems in engineering
<b>CO3</b>	Apply the concepts of fluid statics, kinematics and dynamics while addressing problems in engineering and to determine the fluid flow through open and closed channel.
<b>CO4</b>	Determine the stress & strain for simple stresses, compound stresses, shafts & columns.
<b>CO5</b>	To apply conservation of mass, momentum and energy equation and to determine the discharge of fluid flow.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11/23	4	Simple Stress and Strain: Introduction	15/11/23	4	T1, R2	Smart board , ppt
2.	16/11/23	4	Concept of Stress and Strain, Linear elasticity, Hooke's Law and Poisson's ratio.	16/11/23	4	T1, R2	Smart board , ppt
3.	16/11/23	3	Concept of Stress and Strain, Linear elasticity, Hooke's Law and Poisson's ratio.	16/11/23	3	T1, R2	Smart board , ppt
4.	17/11/23	1	Concept of Stress and Strain, Linear elasticity,	17/11/23	1	T1, R2	Smart board , ppt
5.	17/11/23	3	Extension / Shortening of a bar, bars with varying cross sections	17/11/23	3	T1, R2	Smart board , ppt
6.	20/11/23	4	Extension / Shortening of a bar, bars with varying cross sections	20/11/23	4	T1, R2	Smart board , ppt
7.	21/11/23	4	Extension / Shortening of a bar, bars with varying cross sections	21/11/23	4	T1, R2	Smart board , ppt
8.	22/11/23	3	Elongation due to self-weight	22/11/23	3	T1, R2	Smart board , ppt
9.	23/11/23	1	Elongation due to self-weight	23/11/23	1	T1, R2	Smart board , ppt
10	24/11/23	3	Principle of super position, St. Venant's Principle.	24/11/23	3	T1, R2	Smart board , ppt
11	24/11/23	4	expression for volumetric strain	24/11/23	4	T1, R2	Smart board , ppt
12	24/11/23	4	Elastic Constants and relations.	24/11/23	4	T1, R2	Smart board , ppt
13	27/11/23	3	Stresses in Composite Section	27/11/23	3	T1, R2	Smart board , ppt
14	28/11/23	1	Compound Stresses: Introduction	28/11/23	1	T1, R2	Smart board , ppt
15	28/11/23	3	Concept of Plane stress, Stress tensor for plane stress	28/11/23	3	T1, R2	Smart board , ppt
16	29/11/23	4	Concept of Plane stress, Stress tensor for plane stress	29/11/23	4	T1, R2	Smart board , ppt
17	29/11/23	4	stresses on inclined sections	29/11/23	4	T1, R2	Smart board , ppt
18	1/12/23	3	stresses on inclined sections	1/12/23	3	T1, R2	Smart board , ppt
19	1/12/23	1	principal stresses and	1/12/23	1	T1, R2	Smart



			maximum shear stresses,				board , ppt
20	4/12/23	3	Mohr's circle for plane stress.	4/12/23	3	T1, R2	Smart board , ppt
21	5/12/23	4	Mohr's circle for plane stress.	5/12/23	4	T1, R2	Smart board , ppt
22	6/12/23	4	Torsion of Circular Shafts: Introduction Pure torsion, assumptions,	6/12/23	4	T1, R2	Smart board , ppt
23	7/12/23	3	derivation of torsional equations,	7/12/23	3	T1, R2	Smart board , ppt
24	8/12/23	1	Polar modulus, torsional rigidity / stiffness of shafts	8/12/23	1	T1, R2	Smart board , ppt
25	11/12/23	3	Power transmitted by solid shaft	11/12/23	3	T1, R2	Smart board , ppt
26	12/12/23	4	Euler's theory for axially loaded elastic long columns	12/12/23	4	T1, R2	Smart board , ppt
27	13/12/23	4	Derivation of Euler's load for various end conditions	13/12/23	4	T1, R2	Smart board , ppt
28	14/12/23	3	limitations of Euler's theory, Rankine's formula.	14/12/23	3	T1, R2	Smart board , ppt
29	15/12/23	1	introduction to Fluid mechanics: Introduction, Properties of fluids- mass density, weight density, specific volume, specific gravity, viscosity, surface tension, capillarity	15/12/23	1	T1, R2	Smart board , ppt
30	18/12/23	3	vapour pressure, compressibility and bulk modulus. Concept	18/12/23	3	T1, R2	Smart board , ppt
31	19/12/23	4	vapour pressure, compressibility and bulk modulus. Concept	19/12/23	4	T1, R2	Smart board , ppt
32	20/12/23	4	vapour pressure, compressibility and bulk modulus. Concept	20/12/23	4	T1, R2	Smart board , ppt
33	21/12/23	3	types of fluids pressure at a point in the static mass of fluid, variation of pressure	21/12/23	3	T1, R2	Smart board , ppt
34	22/12/23	1	types of fluids pressure at a point in the static mass of fluid, variation of pressure	22/12/23	1	T1, R2	Smart board , ppt
35	26/12/23	CIE 1					
36	27/12/23						
37	28/12/23						
38	29/12/23						
39	1/1/24	3	. types of fluids pressure at a point in the static mass of fluid, variation of pressure	1/1/24	3	T1, R2	Smart board , ppt
40	2/1/24	4	Pascal's law, absolute, gauge,	2/1/24	4	T1, R2	Smart

			atmospheric and vacuum pressures; pressure measurement by simple,				board , ppt
41	3/1/24	4	Pascal's law, absolute, gauge, atmospheric and vacuum pressures; pressure measurement by simple,	3/1/24	4	T1, R2	Smart board , ppt
42	4/1/24	3	Total pressure and centre of pressure for horizontal plane,	4/1/24	3	T1, R2	Smart board , ppt
43	5/1/24	1	Total pressure and centre of pressure for horizontal plane,	5/1/24	1	T1, R2	Smart board , ppt
44	8/1/24	3	vertical plane surface and inclined plane surface submerged in static fluid.	8/1/24	3	T1, R2	Smart board , ppt
45	9/1/24	4	vertical plane surface and inclined plane surface submerged in static fluid.	9/1/24	4	T1, R2	Smart board , ppt
46	10/1/24	4	Fluid Kinematics: Velocity of fluid particle, types of fluid flow, description of flow	10/1/24	4	T1, R2	Smart board , ppt
47	11/1/24	3	continuity equation, Coordinate free form, acceleration of fluid particle	11/1/24	3	T1, R2	Smart board , ppt
48	12/1/24	1	continuity equation, Coordinate free form, acceleration of fluid particle	12/1/24	1	T1, R2	Smart board , ppt
49	16/1/24	3	continuity equation, Coordinate free form, acceleration of fluid particle	16/1/24	3	T1, R2	Smart board , ppt
50	17/1/24	4	rotational & irrotational flow, equation in velocity potential	17/1/24	4	T1, R2	Smart board , ppt
51	18/1/24	4	rotational & irrotational flow, equation in velocity potential	18/1/24	4	T1, R2	Smart board , ppt
52	19/1/24	3	Poisson's equation in stream function, flownet.	19/1/24	3	T1, R2	Smart board , ppt
53	22/1/24	1	Fluid Dynamics; Introduction. Forces acting on fluid in motion. Euler's equation of motion along a streamline	22/1/24	1	T1, R2	Smart board , ppt
54	23/1/24	3	Fluid Dynamics; Introduction. Forces acting on fluid in motion. Euler's equation of motion along a streamline	23/1/24	3	T1, R2	Smart board , ppt
55	24/1/24	4	Integration of Euler's equation to obtain Bernoulli's equation	24/1/24	4	T1, R2	Smart board , ppt
56	25/1/24	4	Integration of Euler's equation to obtain Bernoulli's equation	25/1/24	4	T1, R2	Smart board , ppt
57	29/1/24	3	Assumptions and limitations of Bernoulli's equation. Major head	29/1/24	3	T1, R2	Smart board , ppt

			loss				
58	30/1/24	1	Introduction to Navier-Stokes equation. Application of Bernoulli's theorem	30/1/24	1	T1, R2	Smart board , ppt
59	31/1/24	3	Introduction to Navier-Stokes equation. Application of Bernoulli's theorem	31/1/24	3	T1, R2	Smart board , ppt
60	1/2/24	4	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube.	1/2/24	4	T1, R2	Smart board , ppt
61	2/2/24	4	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube.	2/2/24	4	T1, R2	Smart board , ppt
62	5/2/24	3	venturi-meter, orifice meter, rectangular and triangular notch, pitot tube	5/2/24	3	T1, R2	Smart board , ppt
63	6/2/24	1	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube. Problems	6/2/24	1	T1, R2	Smart board , ppt
64	7/2/24	3	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube. Problems	7/2/24	3	T1, R2	Smart board , ppt
65	8/2/24	4	venturi-meter, orifice meter, rectangular and triangular notch, pitot tube Problems	8/2/24	4	T1, R2	Smart board , ppt
66	9/2/24	4	Revision	9/2/24	4	T1, R2	Smart board , ppt
67	12/2/24	<b>CIE 2</b>					
68	13/2/24						
69	14/2/24						
70	15/2/24						
71	16/2/24	3	Revision	16/2/24	3	T1, R2	Smart board , ppt
72	19/2/24	1	Revision	19/2/24	1	T1, R2	Smart board , ppt
73	20/2/24	3	Revision	20/2/24	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	21/12/2023
2	SEMINAR	8/2/2024

**Text Books:**

1. Mechanics of Materials Ferdinand Beer & Russell Johnston 2003.

**Reference Book:**

1. Mechanics of Materials Ferdinand Beer & Russell Johnston 2003.



**Faculty**



**Prof. & HOD**  
**Department of Mechatronics**  
**The Oxford College Of Engineering**  
 Hebbal, Bangalore - 560 076

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 25/11/23 to 9/3/24**

**SUB.CODE & Name: MSST 21MT53**

**Year/Sem/Section: 3<sup>RD</sup> / V**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Demonstrate the working methodology of smart materials, Microsystems, electronic circuitry in MEMS devices.

CLO2. Illustrate the process of silicon wafer preparation, thin film deposition techniques, lithography, etching, bulk & surface micromachining involved in MEMS fabrication.

CLO3. Examine the behaviour of piezoresistive & piezoelectric materials required to fabricate pressure sensor & vibration control structures.

CLO4. Measure the performance of pressure sensor & vibration control structure in real time applications.

CLO5: Analyze the behaviour of smart materials for different parameters to has sensor and an actuator.

**COURSE OUTCOMES:**

<b>CO1</b>	Understand the operation and Importance of Micro and Smart Systems.
<b>CO2</b>	Understand the Working Principle and Operation of Various Kinds of Sensors and Actuators.
<b>CO3</b>	Understand the Fabrication Process of Micromachining.
<b>CO4</b>	Understand the operation of Electronics Circuits for Micro and Smart Systems.
<b>CO5</b>	Understand the Working Principle of Controllers for MEMS and BEL Pressure Sensor and Smart Structure in vibration control.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)	
	Date	Hr		Date	Hr			
1.	27/11/23	1	introduction to Micro and Smart systems	27/11/23	1	T1, R2	Smart board , ppt	
2.	28/11/23	5	Miniaturization,	28/11/23	5	T1, R2	Smart board , ppt	
3.	29/11/23	2	Microsystems versus MEMS	29/11/23	2	T1, R2	Smart board , ppt	
4.	1/12/23	2	Microsystems versus MEMS	1/12/23	2	T1, R2	Smart board , ppt	
5.	4/12/23	4	Micro-fabrication	4/12/23	4	T1, R2	Smart board , ppt	
6.	5/12/23	1	Micro-fabrication	5/12/23	1	T1, R2	Smart board , ppt	
7.	6/12/23	5	Smart Materials	6/12/23	5	T1, R2	Smart board , ppt	
8.	8/12/23	2	Structures & Systems	8/12/23	2	T1, R2	Smart board , ppt	
9.	9/12/23	2	Structures & Systems	9/12/23	2	T1, R2	Smart board , ppt	
10	11/12/23	4	Integrated Microsystems	11/12/23	4	T1, R2	Smart board , ppt	
11	12/12/23	1	Application of Smart Materials & Microsystems	12/12/23	1	T1, R2	Smart board , ppt	
12	13/12/23	5	Application of Smart Materials & Microsystems	13/12/23	5	T1, R2	Smart board , ppt	
13	15/12/23	2	Application of Smart Materials & Microsystems	15/12/23	2	T1, R2	Smart board , ppt	
14	18/12/23	2	Micro and Smart Devices and Systems	18/12/23	2	T1, R2	Smart board , ppt	
15	19/12/23	4	Principles and Materials: Definitions and salient features of sensors	19/12/23	4	T1, R2	Smart board , ppt	
16	20/12/23	1	actuators, and systems	20/12/23	1	T1, R2	Smart board , ppt	
17	22/12/23	5	Sensors: silicon capacitive accelerometer	22/12/23	5	T1, R2	Smart board , ppt	
18	23/12/23	2	Piezoresistive pressure sensor	23/12/23	2	T1, R2	Smart board , ppt	
19	25/12/23	2	Portable blood analyzer	25/12/23	2	T1, R2	Smart board , ppt	
20	27/12/23	4	Conduct metric gas sensor	27/12/23	4	T1, R2	Smart board , ppt	
21	28/12/23	<b>CIE 1</b>						
22	29/12/23							

23	30/12/23	<b>CIE 1</b>					
24	1/1/24	1	Actuators: Micro mirror Array for Video Projection	1/1/24	1	T1, R2	Smart board , ppt
25	2/1/24	5	Piezo-electric based inkjet print head,	2/1/24	5	T1, R2	Smart board , ppt
26	3/1/24	2	electrostatic comb-drive	3/1/24	2	T1, R2	Smart board , ppt
27	5/1/24	2	Magnetic micro relay	5/1/24	2	T1, R2	Smart board , ppt
28	8/1/24	4	Micromachining Technologies	8/1/24	4	T1, R2	Smart board , ppt
29	9/1/24	1	Silicon as a Material for Micromachining	9/1/24	1	T1, R2	Smart board , ppt
30	10/1/24	5	Silicon wafer preparation	10/1/24	5	T1, R2	Smart board , ppt
31	12/1/24	2	thin-film deposition techniques,	12/1/24	2	T1, R2	Smart board , ppt
32	13/1/24	2	thin-film deposition techniques,	13/1/24	2	T1, R2	Smart board , ppt
33	16/1/24	4	Lithography,	16/1/24	4	T1, R2	Smart board , ppt
34	17/1/24	1	Etching, Silicon micromachining	17/1/24	1	T1, R2	Smart board , ppt
35	19/1/24	5	surface micromachining bulk micromachining.	19/1/24	5	T1, R2	Smart board , ppt
36	22/1/24	2	Specialized Materials for Microsystems.	22/1/24	2	T1, R2	Smart board , ppt
37	23/1/24	2	Electronics Circuits for Micro and Smart Systems	23/1/24	2	T1, R2	Smart board , ppt
38	24/1/24	4	Semiconductor devices	24/1/24	4	T1, R2	Smart board , ppt
39	27/1/24	1	Diode, Schottky diode	27/1/24	1	T1, R2	Smart board , ppt
40	29/1/24	<b>CIE 2</b>					
41	30/1/24						
42	31/1/24						
43	2/2/24	5	Tunnel diode	2/2/24	5	T1, R2	Smart board , ppt
44	5/2/24	2	Bipolar Junction Transistor (BJT),	5/2/24	2	T1, R2	Smart board , ppt
45	6/2/24	2	MOSFET, and CMOS circuits	6/2/24	2	T1, R2	Smart board , ppt
46	7/2/24	4	Inverter and NAND Gate	7/2/24	4	T1, R2	Smart board , ppt
47	9/2/24	1	Electronics Amplifiers: Operational Amplifiers	9/2/24	1	T1, R2	Smart board , ppt
48	10/2/24	5	Basic Op-Amp circuit, Op-Amp based circuits.	10/2/24	5	T1, R2	Smart board , ppt

49	12/2/24	2	Implementation of Controllers for MEMS & Case Studies of Integrated Microsystems.	12/2/24	2	T1, R2	Smart board , ppt
50	13/2/24	2	Design Methodology, PID controller	13/2/24	2	T1, R2	Smart board , ppt
51	14/2/24	4	Circuit Implementation	14/2/24	4	T1, R2	Smart board , ppt
52	16/2/24	1	Digital controller, Microcontroller & PLC.	16/2/24	1	T1, R2	Smart board , ppt
53	19/2/24	5	Case Studies of Integrated Microsystems:	19/2/24	5	T1, R2	Smart board , ppt
54	20/2/24	2	BEL pressure sensor	20/2/24	2	T1, R2	Smart board , ppt
55	21/2/24	2	design considerations, performance parameters	21/2/24	2	T1, R2	Smart board , ppt
56	23/2/24	4	design considerations, performance parameters	23/2/24	4	T1, R2	Smart board , ppt
57	26/2/24	1	Smart Structure in vibration control.	26/2/24	1	T1, R2	Smart board , ppt
58	27/2/24	5	Smart Structure in vibration control.	27/2/24	5	T1, R2	Smart board , ppt
59	1/3/24	2	Revision	1/3/24	2	T1, R2	Smart board , ppt
60	4/3/24	<b>CIE 3</b>					
61	5/3/24						
62	6/3/24						

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	27/1/2024
2	SEMINAR	26/2/2024

**Text Books:**

1. Micro and Smart Systems V.K.Aatre,Wiley India.

**Reference Book:**

1. Design and Development Methodologies, Smart Material Systems and MEMS V. Varadan, K. J. Vinoy, Goplakrishnan, Wiley.



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hebbaliahalli, Bangalore - 560 066





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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Ms. SEEMA V**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: POWER ELECTRONICS (21MT641)**

**Year/Sem/Section: 3<sup>RD</sup> / VI**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To study and understand the importance of power electronics circuits and their applications.

CLO2. To understand the construction, working, and switching characteristics of various power devices

CLO3. Learn the applications of power devices in AC voltage regulators, controlled rectifiers, choppers and Inverters.

CLO4. Analyze their working under various load conditions

CLO5 To familiarize with the performance parameters of controlled rectifiers, chopper and inverters.

**COURSE OUTCOMES:**

<b>CO1</b>	Have knowledge of semiconductor devices, Thyristors, AC voltage controllers, choppers and inverters.
<b>CO2</b>	. Understand the characteristics and working principles of Thyristors, AC voltage controllers, choppers and inverters
<b>CO3</b>	. Apply control techniques to meet the desired operation of AC voltage regulators, rectifiers and commutation
<b>CO4</b>	Apply control techniques to meet the desired operation of coppers.
<b>CO5</b>	Apply control techniques to meet the desired operation of Inverters

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/4/2024	1	Introduction, Power semiconductor Devices	29/4/2024	1	T1, R2	Smart board , ppt
2.	30/4/2024	3	Applications of Power Electronics,	30/4/2024	3	T1, R2	Smart board , ppt
3.	2/5/2024	3	Applications of Power	2/5/2024	3	T1, R2	Smart

			Electronics,				board , ppt
4.	6/5/2024	1	Power semiconductor devices	6/5/2024	1	T1, R2	Smart board , ppt
5.	7/5/2024	1	Control Characteristics, Types of power electronics circuits	7/5/2024	1	T1, R2	Smart board , ppt
6.	9/5/2024	3	Peripheral effects. Power MOSFETs – switching characteristics, gate drive,	9/5/2024	3	T1, R2	Smart board , ppt
7.	11/5/2024	3	Peripheral effects. Power MOSFETs – switching characteristics, gate drive,	11/5/2024	3	T1, R2	Smart board , ppt
8.	13/5/2024	1	IGBTs, di/dt and dv/dt limitations,	13/5/2024	1	T1, R2	Smart board , ppt
9.	14/5/2024	1	IGBTs, di/dt and dv/dt limitations,	14/5/2024	1	T1, R2	Smart board , ppt
10	16/5/2024	3	Isolation of gate and base drives	16/5/2024	3	T1, R2	Smart board , ppt
11	17/5/2024	3	Isolation of gate and base drives	17/5/2024	3	T1, R2	Smart board , ppt
12	20/5/2024	1	Simple design of gate and base drives.	20/5/2024	1	T1, R2	Smart board , ppt
13	21/5/2024	1	Simple design of gate and base drives.	21/5/2024	1	T1, R2	Smart board , ppt
14	23/5/2024	3	Simple design of gate and base drives.	23/5/2024	3	T1, R2	Smart board , ppt
15	24/5/2024	3	Introduction to Thyristors	24/5/2024	3	T1, R2	Smart board , ppt
16	27/5/2024	1	characteristics, Two Transistor Model Turn-on and turn-off,	27/5/2024	1	T1, R2	Smart board , ppt
17	28/5/2024	1	di/dt and dv/dt protection thyristor types, Thyristors firing circuits,	28/5/2024	1	T1, R2	Smart board , ppt
18	30/5/2024	3	di/dt and dv/dt protection thyristor types, Thyristors firing circuits,	30/5/2024	3	T1, R2	Smart board , ppt
19	31/5/2024	3	Simple design of firing circuits using UJT.	31/5/2024	3	T1, R2	Smart board , ppt
20	3/6/2024	<b>CIE 1</b>					
21	4/6/2024						
22	5/6/2024						
23	6/6/2024	1	Introduction. Natural Communication	6/6/2024	1	T1, R2	Smart board , ppt
24	7/6/2024	1	Forced commutation: self-commutation, impulse commutation	7/6/2024	1	T1, R2	Smart board , ppt
25	10/6/2024	3	resonant pulse commutation and complementary commutations	10/6/2024	3	T1, R2	Smart board , ppt

26	11/6/2024	3	AC Voltage Controllers: Introduction	11/6/2024	3	T1, R2	Smart board , ppt
27	13/6/2024	1	Principle of ON-OFF and phase control.	13/6/2024	1	T1, R2	Smart board , ppt
28	14/6/2024	1	Single-phase bidirectional controllers with resistive and inductive loads. Controlled	14/6/2024	1	T1, R2	Smart board , ppt
29	18/6/2024	3	Single-phase bidirectional controllers with resistive and inductive loads. Controlled	18/6/2024	3	T1, R2	Smart board , ppt
30	20/6/2024	3	Single-phase bidirectional controllers with resistive and inductive loads. Controlled	20/6/2024	3	T1, R2	Smart board , ppt
31	21/6/2024	1	Introduction. Principle of phase controlled converter operation	21/6/2024	1	T1, R2	Smart board , ppt
32	24/6/2024	1	Single phase semi- converters. Full converters	24/6/2024	1	T1, R2	Smart board , ppt
33	25/6/2024	3	Three-phase half-wave converters. Three-phase full-wave converters.	25/6/2024	3	T1, R2	Smart board , ppt
34	27/6/2024	3	DC Choppers: Introduction.	27/6/2024	3	T1, R2	Smart board , ppt
35	28/6/2024	1	Principle of step-down and step-up chopper with R-L load.	28/6/2024	1	T1, R2	Smart board , ppt
36	29/6/2024	1	Principle of step-down and step-up chopper with R-L load.	29/6/2024	1	T1, R2	Smart board , ppt
37	1/7/2024	3	Principle of step-down and step-up chopper with R-L load.	1/7/2024	3	T1, R2	Smart board , ppt
38	2/7/2024	3	Performance parameters. Choppers classification	2/7/2024	3	T1, R2	Smart board , ppt
39	3/7/2024	<b>CIE 2</b>					
40	4/7/2024						
41	5/7/2024						
42	8/7/2024	1	Performance parameters. Choppers classification	8/7/2024	1	T1, R2	Smart board , ppt
43	9/7/2024	1	Performance parameters. Choppers classification	9/7/2024	1	T1, R2	Smart board , ppt
44	11/7/2024	3	Analysis, of impulse commutated thyristor chopper	11/7/2024	3	T1, R2	Smart board , ppt
45	12/7/2024	3	Analysis, of impulse commutated thyristor chopper	12/7/2024	3	T1, R2	Smart board , ppt
46	13/7/2024	1	Analysis, of impulse commutated thyristor chopper	13/7/2024	1	T1, R2	Smart board , ppt

47	15/7/2024	1	Inverters: Introduction	15/7/2024	1	T1, R2	Smart board , ppt
48	16/7/2024	3	Principle of operation	16/7/2024	3	T1, R2	Smart board , ppt
49	18/7/2024	3	Performance parameters.	18/7/2024	3	T1, R2	Smart board , ppt
50	19/7/2024	1	Single-phase bridge inverters. Three phase inverters.	19/7/2024	1	T1, R2	Smart board , ppt
51	22/7/2024	1	Single-phase bridge inverters. Three phase inverters.	22/7/2024	1	T1, R2	Smart board , ppt
52	23/7/2024	3	Single-phase bridge inverters. Three phase inverters.	23/7/2024	3	T1, R2	Smart board , ppt
53	25/7/2024	<b>CIE 3</b>					
54	26/7/2024						
55	27/7/2024						
56	29/7/2024	3	multiple pulse width, and sinusoidal pulse width modulation.	29/7/2024	3	T1, R2	Smart board , ppt
57	30/7/2024	1	multiple pulse width, and sinusoidal pulse width modulation.	30/7/2024	1	T1, R2	Smart board , ppt
58	31/7/2024	1	multiple pulse width, and sinusoidal pulse width modulation.	31/7/2024	1	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
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1	CCE-1 from the above list	7/6/2024
2	CCE-2 from the above list	23/7/2024

**Text Books:**

1. Power electronics”, m h. Rashid 2nd edition, p. H.i/pearson, new delhi, 2002.

**Reference Book:**

1. Power Electronics – converters, Application and Design”, Net Mohan, Tore M.



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Bhuvanahalli, Bangalore - 560 005

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Ms. SEEMA V**

**Academic Year: 15/11/23 to 20/2/23**

**SUB.CODE & Name: PYTHON PROGRAMMING 22BMT306C**

**Year/Sem/Section: 2<sup>ND</sup> / 3<sup>RD</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Learn how to handle loops and creation of functions.

CLO2. How to identify methods to create lists, tuple.

CLO3. Develop programs for strings and file organization.

CLO4. Learn concepts of oops programming.

CLO5: Learn concepts of web development.

**COURSE OUTCOMES:**

<b>CO1</b>	Learn the syntax and semantics of the Python programming language.
<b>CO2</b>	<b>Illustrate the process of structuring the data using lists, tuples</b>
<b>CO3</b>	Appraise the need for working with various documents like Excel, PDF, Word and Others.
<b>CO4</b>	Demonstrate the use of built-in functions to navigate the file system.
<b>CO5</b>	Implement the Object Oriented Programming concepts in Python.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11/23	3	Python Basics , Entering Expression into the Interactive Shell, The Integer, Floating-Point, and String Data Type	15/11/23	3	T1, R2	Smart board , ppt
2.	15/11/23	2	String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program	15/11/23	2	T1, R2	Smart board , ppt
3.	17/11/23	4	Flow control, Boolean Values, Comparison Operators, Boolean Operators,	17/11/23	4	T1, R2	Smart board , ppt
4.	17/11/23	1	Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution,	17/11/23	1	T1, R2	Smart board , ppt
5.	20/11/23	3	Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit()	20/11/23	3	T1, R2	Smart board , ppt
6.	20/11/23	2	Functions, def Statements with Parameters, Return Values and return Statements,	20/11/23	2	T1, R2	Smart board , ppt
7.	21/11/23	4	The None Value, Keyword Arguments and print(), Local and Global Scope,	21/11/23	4	T1, R2	Smart board , ppt
8.	23/11/23	1	The global Statement, Exception Handling, A Short Program: Guess the Number	23/11/23	1	T1, R2	Smart board , ppt
9.	23/11/23	3	Lists, The List Data Type, Working with Lists, Augmented Assignment Operators.	23/11/23	3	T1, R2	Smart board , ppt
10	23/11/23	2	Lists, The List Data Type, Working with Lists, Augmented Assignment Operators.	23/11/23	2	T1, R2	Smart board , ppt
11	24/11/23	4	Methods Example Program: Magic 8 Ball with a List,	24/11/23	4	T1, R2	Smart board , ppt
12	24/11/23	1	Methods Example Program: Magic	24/11/23	1	T1, R2	Smart

			8 Ball with a List,				board , ppt
13	27/11/23	3	Methods Example Program: Magic 8 Ball with a List,	27/11/23	3	T1, R2	Smart board , ppt
14	28/11/23	2	List-like Types: Strings and Tuples, References,	28/11/23	2	T1, R2	Smart board , ppt
15	1/12/23	4	Dictionaries and Structuring Data, The Dictionary Data Type,	1/12/23	4	T1, R2	Smart board , ppt
16	1/12/23	1	Dictionaries and Structuring Data, The Dictionary Data Type,	1/12/23	1	T1, R2	Smart board , ppt
17	4/12/23	3	Manipulating Strings, Working with Strings, Useful String Methods	4/12/23	3	T1, R2	Smart board , ppt
18	4/12/23	2	Project: Password Locker,	4/12/23	2	T1, R2	Smart board , ppt
19	5/12/23	4	Project: Adding Bullets to Wiki Markup	5/12/23	4	T1, R2	Smart board , ppt
20	5/12/23	1	Reading and Writing Files:Files and File Path,The os.path Module.	5/12/23	1	T1, R2	Smart board , ppt
21	7/12/23	3	The File Reading/Writing Process, Saving Variables with the shelve Module,	7/12/23	3	T1, R2	Smart board , ppt
22	7/12/23	2	The File Reading/Writing Process, Saving Variables with the shelve Module,	7/12/23	2	T1, R2	Smart board , ppt
23	8/12/23	4	Saving Variables with print.format() Function,	8/12/23	4	T1, R2	Smart board , ppt
24	8/12/23	1	Generating Random Quiz Files, Project: Multi -Clipboard	8/12/23	1	T1, R2	Smart board , ppt
25	11/12/23	3	Organizing Files, The shutil Module,	11/12/23	3	T1, R2	Smart board , ppt
26	11/12/23	2	Walking a Directory Tree	11/12/23	2	T1, R2	Smart board , ppt
27	14/12/23	4	Compressing Files with zipfile Module	14/12/23	4	T1, R2	Smart board , ppt
28	15/12/23	1	Project: Renaming Files with American-Style Dates to European-Style Dates.	15/12/23	1	T1, R2	Smart board , ppt
29	18/12/23	3	Project: Backing Up a Folder into a ZIP File,	18/12/23	3	T1, R2	Smart board , ppt

30	19/12/23	2	Project: Backing Up a Folder into a ZIP File,	19/12/23	2	T1, R2	Smart board , ppt
31	21/12/23	4	Project: Backing Up a Folder into a ZIP File,	21/12/23	4	T1, R2	Smart board , ppt
32	22/12/23	1	Project: Backing Up a Folder into a ZIP File,	22/12/23	1	T1, R2	Smart board , ppt
33	25/12/23	<b>CIE 1</b>					
34	26/12/23						
35	27/12/23						
36	28/12/23						
37	1/1/24	3	Project: Backing Up a Folder into a ZIP File,	1/1/24	3	T1, R2	Smart board , ppt
38	2/1/24	2	Debugging, Raising Exceptions	2/1/24	2	T1, R2	Smart board , ppt
39	4/1/24	4	Debugging, Raising Exceptions	4/1/24	4	T1, R2	Smart board , ppt
40	5/1/24	1	Debugging, Raising Exceptions	5/1/24	1	T1, R2	Smart board , ppt
41	8/1/24	3	Getting the Traceback as a String.	8/1/24	3	T1, R2	Smart board , ppt
42	9/1/24	2	Getting the Traceback as a String.	9/1/24	2	T1, R2	Smart board , ppt
43	11/1/24	4	Getting the Traceback as a String.	11/1/24	4	T1, R2	Smart board , ppt
44	12/1/24	1	Assertions, Logging, IDLE's Debugger.	12/1/24	1	T1, R2	Smart board , ppt
45	16/1/24	3	Assertions, Logging, IDLE's Debugger.	16/1/24	3	T1, R2	Smart board , ppt
46	18/1/24	2	Assertions, Logging, IDLE's Debugger.	18/1/24	2	T1, R2	Smart board , ppt
47	19/1/24	4	Classes and objects, Programmer-defined types, Attributes,	19/1/24	4	T1, R2	Smart board , ppt
48	22/1/24	1	Classes and objects, Programmer-defined types, Attributes,	22/1/24	1	T1, R2	Smart board , ppt
49	23/1/24	3	Classes and objects, Programmer-defined types, Attributes,	23/1/24	3	T1, R2	Smart board , ppt
50	25/1/24	2	Rectangles, Instances as return values, Objects are mutable, Copying	25/1/24	2	T1, R2	Smart board , ppt

51	29/1/24	4	Classes and functions, Time, Pure functions, Modifiers	29/1/24	4	T1, R2	Smart board , ppt
52	30/1/24	1	Prototyping versus planning	30/1/24	1	T1, R2	Smart board , ppt
53	1/2/24	3	Classes and methods, Object-oriented features, Printing objects,	1/2/24	3	T1, R2	Smart board , ppt
54	2/2/24	2	Another example, A more complicated example, The init method,	2/2/24	2	T1, R2	Smart board , ppt
55	5/2/24	4	The __str__ method, Operator overloading, Type-based dispatch	5/2/24	4	T1, R2	Smart board , ppt
56	6/2/24	1	The __str__ method, Operator overloading, Type-based dispatch	6/2/24	1	T1, R2	Smart board , ppt
57	8/2/24	3	REVISION	8/2/24	3	T1, R2	Smart board , ppt
58	9/2/24	2	REVISION	9/2/24	2		
59	12/2/24	<b>CIE 2</b>					
60	13/2/24						
61	14/2/24						
62	15/2/24						

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	23/12/2023
2	SEMINAR	6/2/2024

**Text Books:**

1. PYTHON FOR BEGINEERS McGRAW HILL 2011

**Reference Book:**

1. PYTHON FOR BEGINEERS McGRAW HILL 2011



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hebbalahalli, Bangalore - 560 066

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### **MECHATRONICS ENGINEERING** **LESSON PLAN**

**Faculty Name:** Dr.Manjula C

**Academic Year:** NOV 2023 - MARCH 2024

**SUB.CODE & Name:** RESEARCH METHODOLOGY & INTELLECTUAL PROPERTY RIGHTS

**Year/Sem/Section:** 3<sup>RD</sup> / V

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To know the meaning of engineering research.

CLO2. To know the procedure of Literature Review and Technical Reading.

CLO3. To know the fundamentals of patent laws and drafting procedure.

CLO4. Understanding the copyright laws and subject matters of copyrights and designs.

CLO5. Understanding the basic principles of design rights.

#### **COURSE OUTCOMES:**

<b>CO1</b>	To Understand the knowledge on basics of research and its types
<b>CO2</b>	To Learn the concept of Literature Review, Technical Reading, Attributions and Citations.
<b>CO3</b>	To learn Ethics in Engineering Research.
<b>CO4</b>	To Discuss the concepts of Intellectual Property Rights.
<b>CO5</b>	To Discuss the concepts of Intellectual Property Rights in engineering.

Sl.no	Planned		Topic	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/11/2023	3	Introduction: Meaning of Research, Objectives of Engineering Research	29/11/2023	3	T1, R2	Smart board , ppt
2.	30/11/2023	3	Motivation in Engineering Research, Types of Engineering Research	30/11/2023		T1, R2	Smart board , ppt
3.	01/12/2023	3	Finding and Solving a Worthwhile Problem	01/12/2023	3	T1, R2	Smart board , ppt
4.	06/12/2023	3	Ethics in Engineering Research, Ethics in Engineering Research Practice	06/12/2023	3	T1, R2	Smart board , ppt
5.	07/12/2023	3	Types of Research Misconduct	07/12/2023	3	T1, R2	Smart board , ppt
6.	08/12/2023	3	Ethical Issues Related to Authorship	08/12/2023	3	T1, R2	Smart board , ppt
7.	13/12/2023	3	Literature Review and Technical Reading, New and Existing Knowledge	13/12/2023	3	T1, R2	Smart board , ppt
8.	14/12/2023	3	Analysis and Synthesis of Prior Art Bibliographic Databases, Web of Science, Google and Google Scholar	14/12/2023	3	T1, R2	Smart board , ppt
9.	15/12/2023	3	Effective Search: The Way Forward Introduction to Technical Reading Conceptualizing Research	15/12/2023	3	T1, R2	Smart board , ppt
10.	20/12/2023	3	Critical and Creative Reading, Taking Notes While Reading	20/12/2023	3	T1, R2	Smart board , ppt
11.	21/12/2023	3	Reading Mathematics and Algorithms, Reading a Datasheet.	21/12/2023	3	T1, R2	Smart board , ppt
12.	22/12/2023	3	Revision of VTU Question Papers	22/12/2023	3	T1, R2	Smart board , ppt
13.	27/12/24	3	Class test.	27/12/24	3	T1, R2	Smart board , ppt
14.	<b>Continuous Internal Evaluation – I 28/12/2023, 29/12/2023, 30/12/2023</b>						
15.	04/01/2024	3	Attributions and Citations: Giving Credit Wherever Due, Citations: Functions and Attributes, Impact of Title and Keywords on Citations, Knowledge Flow through Citation	04/01/2024	3	T1, R2	Smart board , ppt
16.	05/01/2024	3	Citing Datasets, Styles for Citations, Acknowledgments and Attributions, What Should Be Acknowledged, Acknowledgments in, Books	05/01/2024	3	T1, R2	Smart board , ppt

			Dissertations, Dedication or Acknowledgments.				
17.	10/01/2024	3	Introduction to Intellectual Property: Role of IP in the Economic and Cultural Development of the Society, IP Governance	10/01/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
18.	11/01/2024	3	IP as a Global Indicator of Innovation, Origin of IP History of IP in India. Major Amendments in IP Laws and Acts in India	11/01/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
19.	11/01/2024	3	Patents: Conditions for Obtaining a Patent Protection, To Patent or Not to Patent an Invention. Rights Associated with Patents. Enforcement of Patent Rights. Inventions Eligible for Patenting	11/01/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
20.	12/01/2024	3	Non-Patentable Matters. Patent Infringements. Avoid Public Disclosure of an Invention before Patenting. Process of Patenting. Prior Art Search. Choice of Application to be Filed. Patent Application Forms. Jurisdiction of Filing Patent Application. Publication. Pre-grant Opposition. Examination. Grant of a Patent.	12/01/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
21.	17/01/2024	3	Validity of Patent Protection. Post-grant Opposition. Commercialization of a Patent. Need for a Patent Attorney/Agent. Can a Worldwide Patent be Obtained. Do I Need First to File a Patent in India. Patent Related Forms. Fee Structure. Types of Patent Applications. Commonly Used Terms in Patenting. National Bodies Dealing with Patent Affairs. Utility Models	17/01/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
22.	18/01/2024	3	Process of Patenting. Prior Art Search. Choice of Application to be Filed. Patent Application Forms. Jurisdiction of Filing Patent Application. Publication. Pre-grant Opposition. Examination. Grant of a Patent. Validity of Patent Protection. Post-grant Opposition.	18/01/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
23.	19/01/2024	3	Commercialization of a Patent. Need for a Patent Attorney/Agent. Can a Worldwide Patent be Obtained. Do I Need First to File a Patent in India. Patent Related Forms. Fee Structure. Types of Patent Applications. Commonly Used Terms in Patenting. National Bodies Dealing with Patent Affairs. Utility Models.	19/01/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
24.	24/01/2024	3	Revision	24/01/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>

25.	25/01/2024		Class Test			T1, R2	Smart board , ppt
26.	<b>Continuous Internal Evaluation – II 29/01/2024, 30/01/2024, 31/01/2024</b>						
27.	01/02/2024	3	Copyrights and Related Rights: Classes of Copyrights. Criteria for Copyright. Ownership of Copyright. Copyrights of the Author. Copyright Infringements. Copyright Infringement is a Criminal Offence. Copyright Infringement is a Cognizable Offence. Fair Use Doctrine. Copyrights and Internet. Non-Copyright Work. Copyright Registration.	01/02/2024	3	T1, R2	Smart board , ppt
28.	02/02/2024	3	Judicial Powers of the Registrar of Copyrights. Fee Structure. Copyright Symbol. Validity of Copyright. Copyright Profile of India. Copyright and the word 'Publish'. Transfer of Copyrights to a Publisher. Copyrights and the Word 'Adaptation'	02/02/2024	3	T1, R2	Smart board , ppt
29.	07/02/2024	3	Copyrights and the Word 'Indian Work'. Joint Authorship. Copyright Society. Copyright Board. Copyright Enforcement Advisory Council (CEAC). International Copyright Agreements, Conventions and Treaties. Interesting Copyrights Cases	07/02/2024	3	T1, R2	Smart board , ppt
30.	08/02/2024	3	Trademarks: Eligibility Criteria. Who Can Apply for a Trademark. Acts and Laws. Designation of Trademark Symbols. Classification of Trademarks. Registration of a Trademark is Not Compulsory. Validity of Trademark.	08/02/2024	3	T1, R2	Smart board , ppt
31.	09/02/2024	3	Types of Trademark Registered in India. Trademark Registry. Process for Trademarks Registration. Prior Art Search. Famous Case Law: Coca-Cola Company vs. Bisleri International Pvt. Ltd.	09/02/2024	3	T1, R2	Smart board , ppt
32.	14/02/2024	3	Industrial Designs: Eligibility Criteria. Acts and Laws to Govern Industrial Designs. Design Rights. Enforcement of Design Rights. Non-Protectable Industrial Designs India.	14/02/2024	3	T1, R2	Smart board , ppt
33.	15/02/2024	3	Protection Term. Procedure for Registration of Industrial Designs. Prior Art Search. Application for Registration. Duration of the Registration of a Design.	15/02/2024	3		
34.	16/02/2024	3	Importance of Design Registration. Cancellation of the Registered Design. Application Forms. Classification of Industrial Designs.	16/02/2024	3	T1, R2	Smart board , ppt

35.	21/02/2024	3	Designs Registration Trend in India. International Treaties. Famous Case Law: Apple Inc. vs. Samsung Electronics Co.	21/02/2024	3	T1, R2	Smart board , ppt
36.	22/02/2024	3	Geographical Indications: Acts, Laws and Rules Pertaining to GI. Ownership of GI. Rights Granted to the Holders. Registered GI in India. Identification of Registered GI.	22/02/2024	3	T1, R2	Smart board , ppt
37.	23/02/2024	3	Classes of GI. Non-Registerable GI. Protection of GI. Collective or Certification Marks. Enforcement of GI Rights. Procedure for GI Registration Documents Required for GI Registration. GI Ecosystem in India.	23/02/2024	3	T1, R2	Smart board , ppt
38.	28/02/2024	3	Case Studies on Patents. Case study of Curcuma (Turmeric) Patent, Case study of Neem Patent, Case study of Basmati patent. IP Organizations In India. Schemes and Programmes	28/02/2024	3	T1, R2	Smart board , ppt
39.	29/02/2024	3	Revision	29/02/2024	3	T1, R2	Smart board , ppt
40.	01/03/2024	3	Class Test	01/03/2024	3	T1, R2	Smart board , ppt
41.	<b>Continuous Internal Evaluation – III 04/03/2024, 05/03/2024, 06/03/2024</b>						
42.	07/03/2024	3	VTU Question Papers Discussion	07/03/2024	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	7/6/2024
2	Seminar	23/7/2024

**Text Books:**

1. . David V. Thiel “Research Methods for Engineers” Cambridge University Press, 978-1-107-03488- 4.

**Reference Book:**

1. Intellectual Property Rights by N.K.Acharya Asia Law House 6th Edition. ISBN: 978-93-81849-30-9



**Faculty**



**Prof. & HOD**  
 Department of Mechatronics  
 The Oxford College Of Engineering  
 Hebbalbanahalli, Bangalore - 560 076



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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: ARTIFICIAL INTELLIGENCE**

**Year/Sem/Section 4<sup>TH</sup> YEAR / 7<sup>TH</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Have Knowledge of Artificial Intelligence, Production Rules, Search Algorithms Learn concepts of web development.

CLO2. Have Knowledge of Expert System & its architectures, Machine Learning.

CLO3. Understand the working methodology of Search Algorithms

CLO4. Understand the working methodology of Expert System & Machine Learning.

**COURSE OUTCOMES:**

<b>C01</b>	To gain Knowledge of Artificial Intelligence, Production Rules
<b>C02</b>	To gain Knowledge of Search algorithms, Expert System & its architectures
<b>C03</b>	To gain Knowledge of Machine Learning.
<b>C04</b>	To understand the working methodology of Search Algorithms
<b>C05</b>	To understand the working methodology of Expert System & Machine Learning.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Artificial Intelligence: Introduction, History of AI	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Importance f AI	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	Early Work in AI	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	Scope of AI	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	AI and Related fields	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	AI Techniques	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	Alan Turing Machine	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	Intelligent Agents	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Space Representation: Defining the Problem	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Production Rules for water jug problem	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	Breadth-First Search Algorithm	28/9/23	3	T1, R2	Smart board , ppt
12	29/9/23	1	Depth-First Search Algorithm	29/9/23	1	T1, R2	Smart board , ppt
13	29/9/23	2	Generate & Test Algorithm	29/9/23	2	T1, R2	Smart board , ppt
14	29/9/23	1	Hill Climbing Algorithms	29/9/23	1	T1, R2	Smart board , ppt
15	2/10/23	3	Simple Hill Climbing Algorithm	2/10/23	3	T1, R2	Smart board , ppt
16	2/10/23	1	Steepest-Ascent Hill Climbing Algorithm	2/10/23	1	T1, R2	Smart board , ppt
17	4/10/23	2	Expert Systems: Introduction	4/10/23	2	T1, R2	Smart board , ppt
18	5/10/23	1	Characteristics of Expert System	5/10/23	1	T1, R2	Smart board , ppt
19	6/10/23	3	Need of an Expert System	6/10/23	3	T1, R2	Smart board , ppt
20	9/10/23	1	Expert System Architecture	9/10/23	1	T1, R2	Smart board , ppt
21	11/10/23	2	Steps to develop an Expert System	11/10/23	2	T1, R2	Smart board , ppt
22	12/9/23	1	case studies: MYCIN	12/9/23	1	T1, R2	Smart board , ppt

23	13/9/23	3	case studies: DENDRAL	13/9/23	3	T1, R2	Smart board , ppt
24	16/9/23	<b>CIE 1</b>					
25	17/9/23						
26	18/9/23						
27	25/10/23	1	Neural Nets: Introduction	25/10/23	1	T1, R2	Smart board , ppt
28	26/10/23	2	<b>TAN-Toy Adaptive Node</b>	26/10/23	2	T1, R2	Smart board , ppt
29	27/10/23	1	Network Structures	27/10/23	1	T1, R2	Smart board , ppt
30	30/10/23	3	Application of Neural Nets	30/10/23	3	T1, R2	Smart board , ppt
31	2/11/23	1	Expert Systems Architectures: Introduction	2/11/23	1	T1, R2	Smart board , ppt
32	3/11/23	2	Rule-Based System Architectures	3/11/23	2	T1, R2	Smart board , ppt
33	6/11/23	1	Non- Production system Architectures	6/11/23	1	T1, R2	Smart board , ppt
34	8/11/23	3	Semantic Network Architectures	8/11/23	3	T1, R2	Smart board , ppt
35	9/11/23	1	Frame Architectures	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Decision Tree Architectures	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	Blackboard System Architectures	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Analogical Reasoning Architectures	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	Neural Network Architectures	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	Introduction to Machine Learning: Introduction	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						
44	27/11/23	1	Perceptrons	27/11/23	1	T1, R2	Smart board , ppt
45	29/11/23	3	Perceptron Learning Algorithm	29/11/23	3	T1, R2	Smart board , ppt
46	1/12/23	1	Perceptron Learning Algorithm	1/12/23	1	T1, R2	Smart board , ppt
47	4/12/23	2	Checkers Playing Examples	4/12/23	2	T1, R2	Smart board , ppt
48	6/12/23	1	Checkers Playing Examples	6/12/23	1	T1, R2	Smart board , ppt
49	7/12/23	3	Learning automata: Automaton model	7/12/23	3	T1, R2	Smart board , ppt
50	8/12/23	1	Temperature Control Model	8/12/23	1	T1, R2	Smart

							<b>board , ppt</b>
<b>51</b>	11/12/23	2	CLA representation of NIM game	11/12/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>52</b>	13/12/23	1	CLA representation of NIM game	13/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>53</b>	14/12/23	3	Genetic Algorithms	14/12/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>54</b>	15/12/23	1	Genetic Algorithms	15/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>55</b>	18/12/23	2	Intelligent editors	18/12/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>56</b>	20/12/23	1	REVISION	20/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>57</b>	21/12/23	3	REVISION	21/12/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>58</b>	21/12/23	3	REVISION	21/12/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>59</b>	27/12/23	<b>CIE 3</b>					
<b>60</b>	28/12/23						
<b>61</b>	28/12/23						

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

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- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	12/9/2023

2	ASSIGNMENT	17/11/23
3	ASSIGNMENT	21/12/23

**Text Books:**

1. **Artificial Intelligence** Elaine Rich & Kevin Knight, 2004.

**Reference Book:**

1. **Artificial Intelligence A Practical Approach** Er.Rajiv Chopra, S.Chand & Company Ltd



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
He. Channahalli, Bangalore - 560 005

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### MECHATRONICS ENGINEERING

#### LESSON PLAN

**Faculty Name:** Ms. Seema V

**Academic Year:** 11/9/23 to 6/1/24

**SUB.CODE & Name:** AUTOMATION PROCESS CONTROL

**Year/Sem/Section** 4<sup>TH</sup> YEAR / 7<sup>TH</sup> SEM

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Have a knowledge of Process Control System on various Process Parameter ( P,PI,PID) and Converter.

CLO2. Understanding the concepts of Automation in Process Control Involved in Measurement System.

CLO3. Understanding the concepts of Controller used in Industry.

CLO4. Application of Digital and Analog Controller used in various Automated Application based on Controller Parameters.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Gain knowledge of developing basic skills necessary for importance Process controller
<b>CO2</b>	Analog Controller) Using in Various Industry.
<b>CO3</b>	Understand the concepts and various Operation using Automation Process System
<b>CO4</b>	Understand the concepts of Process Control System.
<b>CO5</b>	Determine and Diagnosis the Principles of Various Digital and Analog Controller and ADC, DAC.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	1	process control block diagram	11/9/23	1	T1, R2	Smart board , ppt
2.	12/9/23	4	Control system evolution.	12/9/23	4	T1, R2	Smart board , ppt
3.	14/9/23	4	Final control: introduction to final control operation	14/9/23	4	T1, R2	Smart board , ppt
4.	15/9/23	4	signal conversions, actuators, control elements.	15/9/23	4	T1, R2	Smart board , ppt
5.	18/9/23	1	Alarm and annunciators, control drawing	18/9/23	1	T1, R2	Smart board , ppt
6.	19/9/23	4	P & ID symbols and diagrams,	19/9/23	4	T1, R2	Smart board , ppt
7.	21/9/23	4	flow sheet symbols, inter logic symbols, graphic symbols.	21/9/23	4	T1, R2	Smart board , ppt
8.	22/9/23	4	Introduction,	22/9/23	4	T1, R2	Smart board , ppt
9.	25/9/23	1	process characteristics	25/9/23	1	T1, R2	Smart board , ppt
10	26/9/23	4	control system parameters	26/9/23	4	T1, R2	Smart board , ppt
11	29/9/23	4	discontinuous control modes,	29/9/23	4	T1, R2	Smart board , ppt
12	3/10/23	4	Continuous control modes	3/10/23	4	T1, R2	Smart board , ppt
13	5/10/23	1	composite control modes	5/10/23	1	T1, R2	Smart board , ppt
14	6/10/23	4	composite control modes	6/10/23	4	T1, R2	Smart board , ppt
15	9/10/23	4	composite control modes	9/10/23	4	T1, R2	Smart board , ppt
16	10/10/23	4	Introduction, definition	10/10/23	4	T1, R2	Smart board , ppt
17	12/10/23	1	characteristics of discrete state process control	12/10/23	1	T1, R2	Smart board , ppt
18	13/10/23	4	characteristics of discrete state process control	13/10/23	4	T1, R2	Smart board , ppt
19	16/10/23	<b>CIE 1</b>					
20	17/10/23						
21	18/10/23						
22	23/10/23	4	Control-loop characteristics: Introduction	23/10/23	4	T1, R2	Smart board , ppt
23	24/10/23	4	Control-loop characteristics:	24/10/23	4	T1, R2	Smart board , ppt

			Introduction				
24	26/10/23	1	control system configuration	26/10/23	1	T1, R2	Smart board , ppt
25	27/10/23	4	multivariable control systems	27/10/23	4	T1, R2	Smart board , ppt
26	30/10/23	4	control system quality	30/10/23	4	T1, R2	Smart board , ppt
27	31/10/23	4	stability, and process loop tuning	31/10/23	4	T1, R2	Smart board , ppt
28	2/11/23	1	stability, and process loop tuning	2/11/23	1	T1, R2	Smart board , ppt
29	3/11/23	4	Introduction	3/11/23	4	T1, R2	Smart board , ppt
30	6/11/23	4	general features	6/11/23	4	T1, R2	Smart board , ppt
31	7/11/23	4	electronic controllers	7/11/23	4	T1, R2	Smart board , ppt
32	9/11/23	1	electronic controllers	9/11/23	1	T1, R2	Smart board , ppt
33	10/11/23	4	pneumatic controllers	10/11/23	4	T1, R2	Smart board , ppt
34	13/11/23	4	pneumatic controllers	13/11/23	4	T1, R2	Smart board , ppt
35	16/11/23	4	designs considerations	16/11/23	4	T1, R2	Smart board , ppt
36	17/11/23	1	designs considerations	17/11/23	1	T1, R2	Smart board , ppt
37	20/11/23	<b>CIE 2</b>					
38	21/11/23						
39	22/11/23						
40	23/11/23	4	designs considerations	23/11/23	4	T1, R2	Smart board , ppt
41	24/11/23	4	V-F, and F-V converters	24/11/23	4	T1, R2	Smart board , ppt
42	27/11/23	4	V-F, and F-V converters	27/11/23	4	T1, R2	Smart board , ppt
43	28/11/23	1	performance specifications	28/11/23	1	T1, R2	Smart board , ppt
44	1/12/23	4	D-A conversion techniques	1/12/23	4	T1, R2	Smart board , ppt
45	4/12/23	4	(R-2R & binary weighted) multiplying DAC applications.	4/12/23	4	T1, R2	Smart board , ppt
46	5/12/23	4	(R-2R & binary weighted) multiplying DAC applications.	5/12/23	4	T1, R2	Smart board , ppt
47	7/12/23	1	A-D conversion techniques	7/12/23	1	T1, R2	Smart board , ppt
48	8/12/23	4	flash, successive approximation	8/12/23	4	T1, R2	Smart board , ppt
49	11/12/23	4	single slope	11/12/23	4	T1, R2	Smart

							<b>board , ppt</b>
<b>50</b>	12/12/23	4	dual slope	12/12/23	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>51</b>	14/12/23	1	Over sampling converters.	14/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>52</b>	15/12/23	4	Over sampling converters.	15/12/23	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>53</b>	18/12/23	4	Revision	18/12/23	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>54</b>	19/12/23	4	Revision	19/12/23	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>55</b>	21/12/23	1	Revision	21/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>56</b>	27/12/23	<b>CIE 3</b>					
<b>57</b>	28/12/23						
<b>58</b>	29/12/23						

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	13/10/2023
2	ASSIGNMENT	17/11/23
3	ASSIGNMENT	21/12/23

**Text Books:**

1. Process Control Instrumentation Technology- Tata McGraw Hill. 2012.

**Reference Book:**

1. Process Control Instrumentation Technology- Design with operational amplifiers and analog integrated circuits 2011



**Faculty**



**Prof. & HOD**  
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**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Dr.Manjula C**

**Academic Year: 15/11/23 to 20/2/23**

**SUB.CODE & Name: COA BMT304**

**Year/Sem/Section:2<sup>ND</sup> / 3<sup>RD</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Explain the basic organization of a computer system.

CLO2. Explain different ways of accessing an input / output device including interrupts

CLO3.

CLO3. Illustrate the organization of different types of semiconductor and other secondary storage memories.

CLO4: Illustrate simple processor organization based on hardwired control and micro programmed control

**COURSE OUTCOMES:**

<b>CO1</b>	Explain the basic sub systems of a computer, their organization, structure and operation.
<b>CO2</b>	Illustrate the concept of programs as sequences of machine instructions.
<b>CO3</b>	Demonstrate different ways of communicating with I/O devices
<b>CO4</b>	Describe memory hierarchy and concept of virtual memory
<b>CO5</b>	Illustrate organization of simple pipelined processor and other computing systems.



SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11/23	3	Python Basics , Entering Expression into the Interactive Shell, The Integer, Floating-Point, and String Data Type	15/11/23	3	T1, R2	Smart board , ppt
2.	15/11/23	2	String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program	15/11/23	2	T1, R2	Smart board , ppt
3.	16/11/23	2	Flow control, Boolean Values, Comparison Operators, Boolean Operators,	16/11/23	2	T1, R2	Smart board , ppt
4.	16/11/23	2	Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution,	16/11/23	2	T1, R2	Smart board , ppt
5.	17/11/23	3	Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit()	17/11/23	3	T1, R2	Smart board , ppt
6.	17/11/23	2	Functions, def Statements with Parameters, Return Values and return Statements,	17/11/23	2	T1, R2	Smart board , ppt
7.	21/11/23	2	The None Value, Keyword Arguments and print(), Local and Global Scope,	21/11/23	2	T1, R2	Smart board , ppt
8.	22/11/23	2	The global Statement, Exception Handling, A Short Program: Guess the Number	22/11/23	2	T1, R2	Smart board , ppt
9.	22/11/23	3	Lists, The List Data Type, Working with Lists, Augmented Assignment Operators.	22/11/23	3	T1, R2	Smart board , ppt
10	23/11/23	2	Lists, The List Data Type, Working with Lists, Augmented Assignment Operators.	23/11/23	2	T1, R2	Smart board , ppt
11	23/11/23	2	Methods Example Program: Magic 8 Ball with a List,	23/11/23	2	T1, R2	Smart board , ppt
12	24/11/23	2	Methods Example Program: Magic	24/11/23	2	T1, R2	Smart

			8 Ball with a List,				board , ppt
13	24/11/23	3	Methods Example Program: Magic 8 Ball with a List,	24/11/23	3	T1, R2	Smart board , ppt
14	24/11/23	2	List-like Types: Strings and Tuples, References,	24/11/23	2	T1, R2	Smart board , ppt
15	28/11/23	2	Dictionaries and Structuring Data, The Dictionary Data Type,	28/11/23	2	T1, R2	Smart board , ppt
16	28/11/23	2	Dictionaries and Structuring Data, The Dictionary Data Type,	28/11/23	2	T1, R2	Smart board , ppt
17	29/11/23	3	Manipulating Strings, Working with Strings, Useful String Methods	29/11/23	3	T1, R2	Smart board , ppt
18	29/11/23	2	Project: Password Locker,	29/11/23	2	T1, R2	Smart board , ppt
19	1/12/23	2	Project: Adding Bullets to Wiki Markup	1/12/23	2	T1, R2	Smart board , ppt
20	1/12/23	2	Reading and Writing Files:Files and File Path,The os.path Module.	1/12/23	2	T1, R2	Smart board , ppt
21	5/12/23	3	The File Reading/Writing Process, Saving Variables with the shelve Module,	5/12/23	3	T1, R2	Smart board , ppt
22	5/12/23	2	The File Reading/Writing Process, Saving Variables with the shelve Module,	5/12/23	2	T1, R2	Smart board , ppt
23	6/12/23	2	Saving Variables with print.format() Function,	6/12/23	2	T1, R2	Smart board , ppt
24	6/12/23	2	Generating Random Quiz Files, Project: Multi -Clipboard	6/12/23	2	T1, R2	Smart board , ppt
25	7/12/23	3	Organizing Files, The shutil Module,	7/12/23	3	T1, R2	Smart board , ppt
26	7/12/23	2	Walking a Directory Tree	7/12/23	2	T1, R2	Smart board , ppt
27	8/12/23	2	Compressing Files with zipfile Module	8/12/23	2	T1, R2	Smart board , ppt
28	8/12/23	2	Project: Renaming Files with American-Style Dates to European-Style Dates.	8/12/23	2	T1, R2	Smart board , ppt
29	12/12/23	3	Project: Backing Up a Folder into a ZIP File,	12/12/23	3	T1, R2	Smart board , ppt

30	13/12/23	2	Project: Backing Up a Folder into a ZIP File,	13/12/23	2	T1, R2	Smart board , ppt
31	14/12/23	2	Project: Backing Up a Folder into a ZIP File,	14/12/23	2	T1, R2	Smart board , ppt
32	15/12/23	2	Project: Backing Up a Folder into a ZIP File,	15/12/23	2	T1, R2	Smart board , ppt
33	19/12/23	3	Project: Backing Up a Folder into a ZIP File,	19/12/23	3	T1, R2	Smart board , ppt
34	20/12/23	2	Debugging, Raising Exceptions	20/12/23	2	T1, R2	Smart board , ppt
35	21/12/23	2	Debugging, Raising Exceptions	21/12/23	2	T1, R2	Smart board , ppt
36	22/12/23	2	Debugging, Raising Exceptions	22/12/23	2	T1, R2	Smart board , ppt
37	23/12/23	3	Getting the Traceback as a String.	23/12/23	3	T1, R2	Smart board , ppt
38	23/12/23	2	Getting the Traceback as a String.	23/12/23	2	T1, R2	Smart board , ppt
39	23/12/23	2	Getting the Traceback as a String.	23/12/23	2	T1, R2	Smart board , ppt
40	26/12/23	<b>CIE 1</b>					
41	27/12/23						
42	28/12/23						
43	2/1/24	2	Assertions, Logging, IDLE's Debugger.	2/1/24	2	T1, R2	Smart board , ppt
44	2/1/24	3	Assertions, Logging, IDLE's Debugger.	2/1/24	3	T1, R2	Smart board , ppt
45	3/1/24	2	Assertions, Logging, IDLE's Debugger.	3/1/24	2	T1, R2	Smart board , ppt
46	4/1/24	2	Classes and objects, Programmer-defined types, Attributes,	4/1/24	2	T1, R2	Smart board , ppt
47	4/1/24	2	Classes and objects, Programmer-defined types, Attributes,	4/1/24	2	T1, R2	Smart board , ppt
48	5/1/24	3	Classes and objects, Programmer-defined types, Attributes,	5/1/24	3	T1, R2	Smart board , ppt
49	9/1/24	2	Rectangles, Instances as return values, Objects are mutable, Copying	9/1/24	2	T1, R2	Smart board , ppt
50	10/1/24	2	Classes and functions, Time, Pure functions, Modifiers	10/1/24	2	T1, R2	Smart board , ppt

51	11/1/24	2	Prototyping versus planning	11/1/24	2	T1, R2	Smart board , ppt
52	12/1/24	3	Classes and methods, Object-oriented features, Printing objects,	12/1/24	3	T1, R2	Smart board , ppt
53	16/1/24	2	Another example, A more complicated example, The init method,	16/1/24	2	T1, R2	Smart board , ppt
54	17/1/24	2	The __str__ method, Operator overloading, Type-based dispatch	17/1/24	2	T1, R2	Smart board , ppt
55	18/1/24	2	The __str__ method, Operator overloading, Type-based dispatch	18/1/24	2	T1, R2	Smart board , ppt
56	19/1/24	3	REVISION	19/1/24	3	T1, R2	Smart board , ppt
57	23/1/24	2	REVISION	23/1/24	2	T1, R2	Smart board , ppt
58	25/1/24	<b>CIE 2</b>					
59	26/1/24						
60	27/1/24						

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	23/12/2023
2	SEMINAR	23/1/24

**Text Books:**

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky: Computer Organization, 5th Edition, Tata McGraw Hill, 2002.

**Reference Book:**

1. David A. Patterson, John L. Hennessy: Computer Organization and Design – The Hardware /Software Interface ARM Edition, 4th Edition, Elsevier, 2009.



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hebbalahalli, Bangalore - 560 066

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Ms. Seema V**

**Academic Year: 25/11/23 to 9/3/24**

**SUB.CODE & Name: MSST 21MT53**

**Year/Sem/Section: 3<sup>RD</sup> / V**

**COURSE OBJECTIVES** This course will enable the students to

- CLO1. Demonstrate the concepts of control systems and its specifications for mathematical modelling.
- CLO2. Understand the structured LabVIEW programming concepts in developing Virtual Instrumentation.
- CLO3. Understand general purpose interface bus and Serial communication Interface.
- CLO4. Develop the mathematical model for mechanical and electrical systems.
- CLO5: Analyse various applications on Real time monitoring using DAQ boards.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain fundamental knowledge of control systems, mathematical modelling of physical system.
<b>CO2</b>	Solve the control system problems using block diagram reduction technique and Mason's gain formula.
<b>CO3</b>	Understand the importance of Virtual Instrumentation and various operation of DAQ devices.
<b>CO4</b>	Identify and analyse the basic programming concepts in Lab View.
<b>CO5</b>	Compare types of I/O module, Data Acquisition System and Communication Networks (Bus Systems) using Standard Protocol, and examine analysis tools.



SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	27/11/23	1	MODELLING OF SYSTEMS AND BLOCK DIAGRAM	27/11/23	1	T1, R2	Smart board , ppt
2.	28/11/23	3	Introduction to control systems	28/11/23	3	T1, R2	Smart board , ppt
3.	29/11/23	3	types of control systems,	29/11/23	3	T1, R2	Smart board , ppt
4.	1/12/23	2	concept of mathematical modelling of physical systems- mechanical	1/12/23	2	T1, R2	Smart board , ppt
5.	4/12/23	1	concept of mathematical modelling of physical systems- mechanical	4/12/23	1	T1, R2	Smart board , ppt
6.	5/12/23	3	translational (mechanical accelerometer	5/12/23	3	T1, R2	Smart board , ppt
7.	6/12/23	3	systems excluded), and rotational systems	6/12/23	3	T1, R2	Smart board , ppt
8.	8/12/23	2	systems excluded), and rotational systems	8/12/23	2	T1, R2	Smart board , ppt
9.	9/12/23	1	analogous systems based on force voltage analogy and force current analogy	9/12/23	1	T1, R2	Smart board , ppt
10	11/12/23	3	analogous systems based on force voltage analogy and force current analogy	11/12/23	3	T1, R2	Smart board , ppt
11	12/12/23	3	analogous systems based on force voltage analogy and force current analogy	12/12/23	3	T1, R2	Smart board , ppt
12	13/12/23	2	analogous systems based on force voltage analogy and force current analogy	13/12/23	2	T1, R2	Smart board , ppt
13	15/12/23	1	BLOCK DIAGRAM:	15/12/23	1	T1, R2	Smart board , ppt
14	18/12/23	3	Introduction to block	18/12/23	3	T1, R2	Smart board , ppt
15	19/12/23	3	diagram algebra and numerical problems	19/12/23	3	T1, R2	Smart board , ppt
16	20/12/23	2	numerical problems	20/12/23	2	T1, R2	Smart board , ppt
17	22/12/23	1	numerical problems	22/12/23	1	T1, R2	Smart board , ppt
18	23/12/23	3	numerical problems	23/12/23	3	T1, R2	Smart board , ppt
19	25/12/23	3	SIGNAL FLOW GRAPH: Introduction to Signal	25/12/23	3	T1, R2	Smart board , ppt

			Flow graph				
20	27/12/23	2	SIGNAL FLOW GRAPH: Introduction to Signal.	27/12/23	2	T1, R2	Smart board , ppt
21	28/12/23	<b>CIE 1</b>					
22	29/12/23						
23	30/12/23						
24	1/1/24	1	Mason's gain formula	1/1/24	1	T1, R2	Smart board , ppt
25	2/1/24	3	Obtaining Transfer functions for the given SFG using Mason's gain formula.	2/1/24	3	T1, R2	Smart board , ppt
26	3/1/24	3	Obtaining Transfer functions for the given SFG using Mason's gain formula.	3/1/24	3	T1, R2	Smart board , ppt
27	5/1/24	2	Obtaining Transfer functions for the given SFG using Mason's gain formula.	5/1/24	2	T1, R2	Smart board , ppt
28	8/1/24	1	CONCEPT OF VIRTUAL INSTRUMENTATION AND DAQ SYSTEMS	8/1/24	1	T1, R2	Smart board , ppt
29	9/1/24	3	Concepts of Instrumentation and Measurements Historical perspective	9/1/24	3	T1, R2	Smart board , ppt
30	10/1/24	3	Need of VI – Advantages of VI – Define VI	10/1/24	3	T1, R2	Smart board , ppt
31	12/1/24	2	Block diagram & Architecture of VI – Data flow techniques –	12/1/24	2	T1, R2	Smart board , ppt
32	13/1/24	1	Graphical programming in data flow	13/1/24	1	T1, R2	Smart board , ppt
33	16/1/24	3	Comparison with conventional programming.	16/1/24	3	T1, R2	Smart board , ppt
34	17/1/24	3	Comparison with conventional programming.	17/1/24	3	T1, R2	Smart board , ppt
35	19/1/24	2	PC based data acquisition, Signal conditioning functions	19/1/24	2	T1, R2	Smart board , ppt
36	22/1/24	1	calibration, resolution	22/1/24	1	T1, R2	Smart board , ppt
37	23/1/24	3	ADC, DAC, Single-ended and differential inputs,	23/1/24	3	T1, R2	Smart board , ppt
38	24/1/24	3	calibration, resolution	24/1/24	3	T1, R2	Smart board , ppt
39	27/1/24	2	ADC, DAC, Single-ended and differential inputs,	27/1/24	2	T1, R2	Smart board , ppt
40	29/1/24						

41	30/1/24	<b>CIE 2</b>					
42	31/1/24						
43	2/2/24	1	Sampling fundamentals – sampling, sampling theorem	2/2/24	1	T1, R2	Smart board , ppt
44	5/2/24	3	sampling frequency	5/2/24	3	T1, R2	Smart board , ppt
45	6/2/24	3	CONCEPTS OF GRAPHICAL PROGRAMMING:	6/2/24	3	T1, R2	Smart board , ppt
46	7/2/24	2	Lab-view software – Concept of VIs and sub VI	7/2/24	2	T1, R2	Smart board , ppt
47	9/2/24	1	Lab-view software – Concept of VIs and sub VI	9/2/24	1	T1, R2	Smart board , ppt
48	10/2/24	3	Loops (While Loop and For Loop),	10/2/24	3	T1, R2	Smart board , ppt
49	12/2/24	3	Loops (While Loop and For Loop),	12/2/24	3	T1, R2	Smart board , ppt
50	13/2/24	2	Structures (Case, Formula node, and sequence structures)	13/2/24	2	T1, R2	Smart board , ppt
51	14/2/24	1	Structures (Case, Formula node, and sequence structures)	14/2/24	1	T1, R2	Smart board , ppt
52	16/2/24	3	Arrays Operations, Strings Operations	16/2/24	3	T1, R2	Smart board , ppt
53	19/2/24	3	and file I/O. Examples on each.	19/2/24	3	T1, R2	Smart board , ppt
54	20/2/24	2	and file I/O. Examples on each.	20/2/24	2	T1, R2	Smart board , ppt
55	21/2/24	1	INTERFACING OF EXTERNAL INSTRUMENTS TO A PC:	21/2/24	1	T1, R2	Smart board , ppt
56	23/2/24	3	RS232, RS 422, RS 485 and USB standards	23/2/24	3	T1, R2	Smart board , ppt
57	26/2/24	3	RS232, RS 422, RS 485 and USB standards	26/2/24	3	T1, R2	Smart board , ppt
58	27/2/24	2	IEEE 488 standard – ISO-OSI model for serial bus	27/2/24	2	T1, R2	Smart board , ppt
59	1/3/24	1	IEEE 488 standard – ISO-OSI model for serial bus.	1/3/24	1	T1, R2	Smart board , ppt
60	4/3/24	<b>CIE 3</b>					
61	5/3/24						
62	6/3/24						

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	ASSIGNMENT	27/1/2024
2	SEMINAR	26/2/2024

### Text Books:

1. “Virtual Instrumentation using LabVIEW” Jovitha Jerome, PHI publication.

### Reference Book:

1. “Control Systems Engineering”, I.J. Nagarath and M. Gopal ,New Age International (P) Limited, Publishers, Fifth edition – 2012.



Faculty



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hebbal, Bangalore - 560 053

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Bommanahalli, Hosur Road, Bangalore –560068.

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**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: Hydraulics and Pneumatics (BMT403)**

**Year/Sem/Section: 2<sup>nd</sup> / IV**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To gain basic knowledge of hydraulic and pneumatic systems.

CLO2. To Understanding the working principles of hydraulics and pneumatics components.

CLO3. To Apply the knowledge of hydraulic systems to design hydraulic circuits for different application.

CLO4. To Apply the knowledge of pneumatic systems to design pneumatic circuits for different application.

CLO5: To Design hydraulic and pneumatic circuits with multicylinder applications using solenoid control.

**COURSE OUTCOMES:**

<b>CO1</b>	Understand different components of pneumatic and hydraulic circuits.
<b>CO2</b>	Demonstrate working of valves, solenoids, and pumps.
<b>CO3</b>	Apply concepts of pneumatic and hydraulic to design and develop respective circuits.
<b>CO4</b>	Design and analyse Hydraulic/pneumatic circuits.
<b>CO5</b>	Design pneumatic circuits for various industrial applications using experimental pneumatic kits

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/2024	1	Definition of hydraulic system structure of hydraulic control	22/4/2024	1	T1, R2	Smart board , ppt
2.	23/4/2024	3	system. Structure of Pneumatic control System, fluid conditioners and FRL unit. Pneumatic	23/4/2024	3	T1, R2	Smart board , ppt



3.	25/4/2024	3	advantages, limitations, applications	25/4/2024	3	T1, R2	Smart board , ppt
4.	27/4/2024	4	Pumps, classification of pumps,	27/4/2024	4	T1, R2	Smart board , ppt
5.	29/4/2024	1	pumping theory of positive displacement pumps	29/4/2024	1	T1, R2	Smart board , ppt
6.	30/4/2024	3	construction and working of gear pumps	30/4/2024	3	T1, R2	Smart board , ppt
7.	2/5/2024	3	vane pumps, piston pumps,	2/5/2024	3	T1, R2	Smart board , ppt
8.	3/5/2024	4	fixed and variable displacement pumps	3/5/2024	4	T1, R2	Smart board , ppt
9.	6/5/2024	1	pump performance characteristics	6/5/2024	1	T1, R2	Smart board , ppt
10	7/5/2024	3	pump selection factor, problems on pumps	7/5/2024	3	T1, R2	Smart board , ppt
11	9/5/2024	3	pump selection factor, problems on pumps	9/5/2024	3	T1, R2	Smart board , ppt
12	11/5/2024	4	Classification: cylinder and hydraulic motors, Linear Hydraulic Actuators [cylinders],	11/5/2024	4	T1, R2	Smart board , ppt
13	13/5/2024	1	single and double acting cylinder, Cylinder cushioning,	13/5/2024	1	T1, R2	Smart board , ppt
14	14/5/2024	3	special types of cylinders, problems on cylinders,	14/5/2024	3	T1, R2	Smart board , ppt
15	16/5/2024	3	construction and working of rotary actuators such as gear	16/5/2024	3	T1, R2	Smart board , ppt
16	17/5/2024	4	vane, piston motors, Hydraulic Motor Theoretical Torque,	17/5/2024	4	T1, R2	Smart board , ppt
17	20/5/2024	1	Power and Flow Rate, Hydraulic Motor Performance	20/5/2024	1	T1, R2	Smart board , ppt
18	21/5/2024	3	problems, symbolic representation of hydraulic actuators.	21/5/2024	3	T1, R2	Smart board , ppt
19	23/5/2024	3	Classification of control valves, Directional Control Valves- Symbolic representation	23/5/2024	3	T1, R2	Smart board , ppt
20	24/5/2024	4	constructional features of poppet, sliding spool	24/5/2024	4	T1, R2	Smart board , ppt
21	25/5/2024	1	otary type valves solenoid and pilot operated DCV.	25/5/2024	1	T1, R2	Smart board , ppt
22	27/5/2024	3	shuttle valve, check valves,	27/5/2024	3	T1, R2	Smart board , ppt
23	28/5/2024	3	Pressure control valves - types, direct operated types and pilot operated types.	28/5/2024	3	T1, R2	Smart board , ppt

24	30/5/2024	4	Quick exhaust valve, time delay valve, shuttle valve, twin pressure valve	30/5/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
25	31/5/2024	1	Flow Control Valves - compensated and non-compensated FCV	31/5/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
26	3/6/2024	3	needle valve, temperature compensated	3/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
27	4/6/2024	3	pressure compensated,	4/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
28	6/6/2024	4	pressure and temperature compensated FCV	6/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
29	7/6/2024	1	symbolic representation	7/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
30	8/6/2024	3	Control of Single and Double - Acting Hydraulic Cylinder, Regenerative circuit, Pump Unloading Circuit, Double Pump Hydraulic System	8/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
31	13/6/2024	3	Counter balance Valve Application, Hydraulic Cylinder Sequencing Circuits	13/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
32	14/6/2024	4	Automatic cylinder reciprocating system,	14/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
33	18/6/2024	1	Locked Cylinder using Pilot check Valve, Cylinder synchronizing circuit using different methods, factors affecting synchronization,	18/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
34	20/6/2024	3	Speed Control of Hydraulic Cylinder, Speed Control of Hydraulic Motors, Safety circuit, Accumulators, types, construction and applications with circuits.	20/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
35	21/6/2024	3	General type of Fluids, Sealing Devices,	21/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
36	24/6/2024	4	Use of Logic gates - OR and AND gates in pneumatic applications. Practical Examples involving the use of logic gates	24/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
37	25/6/2024	1	Use of Logic gates - OR and AND gates in pneumatic applications. Practical Examples involving the use of logic gates	25/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
38	27/6/2024	3	Pressure dependent controls- types - construction - practical applications, Time	27/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>

			dependent controls principle, Construction, practical applications				
39	28/6/2024	3	Pressure dependent controls- types - construction - practical applications, Time dependent controls principle, Construction, practical applications	28/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
40	29/6/2024	4	Coordinated and sequential motion control, Motion and control diagrams	29/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
41	1/7/2024	1	Coordinated and sequential motion control,	1/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
42	2/7/2024	3	Signal elimination methods, Cascading method- principle, Practical application examples	2/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
43	4/7/2024	3	Signal elimination methods, Cascading method- principle,	4/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
44	5/7/2024	4	signal input and output, pilot assisted solenoid control of directional control valves	5/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
45	8/7/2024	1	signal input and output	8/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
46	9/7/2024	3	Use of relay and contactors..	9/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
47	11/7/2024	3	Control circuitry for simple signal cylinder application	11/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
48	12/7/2024	4	Control circuitry for simple signal cylinder application	12/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
49	13/7/2024	1	, pilot assisted solenoid control of directional control valves	13/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
50	15/7/2024	3	, pilot assisted solenoid control of directional control valves	15/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
51	16/7/2024	3	Practical application examples	16/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
52	18/7/2024	4	Practical application examples	18/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
53	19/7/2024	1	Motion and control diagrams	19/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
54	22/7/2024	3	Motion and control diagrams	22/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
55	23/7/2024	3	Motion and control diagrams	23/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
56	25/7/2024	4	Reservoir System, Filters and	25/7/2024	4	<b>T1, R2</b>	<b>Smart</b>

			Strainers,				board , ppt
57	26/7/2024	1	Reservoir System, Filters and Strainers,	26/7/2024	1	T1, R2	Smart board , ppt
58	27/7/2024	3	Reservoir System, Filters and Strainers,	27/7/2024	3	T1, R2	Smart board , ppt
59	1/8/2024	3	Use of relay and contactors. Control circuitry for simple signal	1/8/2024	3	T1, R2	Smart board , ppt
60	2/8/2024	4	cylinder application	2/8/2024	4	T1, R2	Smart board , ppt
61	5/8/2024	1	cylinder application	5/8/2024	1	T1, R2	Smart board , ppt
62	6/8/2024	3	Use of relay and contactors. Control circuitry for simple signal cylinder application	6/8/2024	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list	6/6/2024
2	CCE-2 from the above list	26/7/2024

**Text Books:**

1. "Fluid Power with Applications", Anthony Esposito, Sixth edition, Pearson Education, Inc, 2000.  
'Pneumatics and Hydraulics', Andrew Parr, Jaico Publishing Co.
2. Fluid Mechanics and Fluid Machines, Dr. Bansal, R.K. Lakshmi Publications, 2004

**Reference Book:**

1. 'Oil Hydraulic systems', Principles and Maintenance S. R. Majurr, Tata McGraw Hill Publishing Company Ltd.
2. 'Industrial Hydraulics', Pippenger, Hicks" McGraw Hill, New York.



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hechanahalli, Bangalore - 560 065

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1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### MECHATRONICS ENGINEERING LESSON PLAN

**Faculty Name: Mr.Jaideep R**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: INDUSTRIAL ROBOTICS (21MT63)**

**Year/Sem/Section: 3<sup>RD</sup> / VI**

**COURSE OBJECTIVES** This course will enable the students to  
CLO1. To gain knowledge on basics of Robotics  
CLO2. To understand Robot Kinematics and Dynamics, Sensors used in Robots  
CLO3. To understand basics of Robot programming and Artificial Intelligence  
CLO4. To gain knowledge on robot layout and cell design  
CLO5. To relate the knowledge on robotics and understand the application of Robots in Industries

#### **COURSE OUTCOMES:**

<b>CO1</b>	To understand the basics of robotics, sensors, Programming and Applications of Robots
<b>CO2</b>	To illustrate the different applications of robotics in Industries
<b>CO3</b>	To analyze simple robot kinematics.
<b>CO4</b>	To analyze simple robot dynamics
<b>CO5</b>	To design general robot cell layouts

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/4/2024	3	Fundamentals of Robotics	29/4/2024	3	T1, R2	Smart board , ppt
2.	30/4/2024	1	Fundamentals of Robotics	30/4/2024	1	T1, R2	Smart board , ppt
3.	1/5/2024	4	robot anatomy, work volume	1/5/2024	4	T1, R2	Smart board , ppt
4.	3/5/2024	2	robot anatomy, work volume	3/5/2024	2	T1, R2	Smart



							<b>board , ppt</b>	
5.	6/5/2024	3	robot drive systems	6/5/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
6.	7/5/2024	1	robot drive systems	7/5/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
7.	8/5/2024	4	control systems, precision of movement,	8/5/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
8.	11/5/2024	2	control systems, precision of movement,	11/5/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
9.	13/5/2024	3	control systems, precision of movement,	13/5/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
10	14/5/2024	1	end effectors, robotic sensors,	14/5/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
11	15/5/2024	4	end effectors, robotic sensors,	15/5/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
12	17/5/2024	2	robot programming and work cell control	17/5/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
13	20/5/2024	3	robot programming and work cell control	20/5/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
14	21/5/2024	1	robot programming and work cell control	21/5/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
15	22/5/2024	4	robot applications, problems	22/5/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
16	24/5/2024	2	robot applications, problems	24/5/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
17	25/5/2024	3	robot applications, problems	25/5/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
18	3/6/2024	CIE 1						
19	4/6/2024							
20	5/6/2024							
21	4/6/2024	1	Basic control systems and components	4/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
22	7/6/2024	4	Basic control systems and components	7/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
23	10/6/2024	2	Basic control systems concepts and models	10/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
24	11/6/2024	3	Basic control systems concepts and models	11/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
25	12/6/2024	1	control system analysis,	12/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
26	13/6/2024	4	control system analysis,	13/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
27	14/6/2024	2	robot sensors and actuators.	14/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
28	18/6/2024	3	robot sensors and actuators.	18/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
29	19/6/2024	1	Robot Motion Analysis	19/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
30	21/6/2024	4	Robot Motion Analysis	21/6/2024	4	<b>T1, R2</b>	<b>Smart</b>	

							<b>board , ppt</b>
<b>31</b>	24/6/2024	2	Introduction to manipulator kinematics	24/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>32</b>	25/6/2024	3	homogeneous transformations and robot kinematics	25/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>33</b>	26/6/2024	1	homogeneous transformations and robot kinematics	26/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>34</b>	28/6/2024	4	D-H convention, manipulator path control	28/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>35</b>	29/6/2024	2	D-H convention, manipulator path control	29/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>36</b>	1/7/2024	3	robot dynamics, configuration of a robot controller	1/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>37</b>	2/7/2024	1	Robot End Effectors: types of end effecters	2/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>38</b>	3/7/2024	<b>CIE 2</b>					
<b>39</b>	4/7/2024						
<b>40</b>	5/7/2024						
<b>41</b>	8/7/2024	<b>4</b>	mechanical grippers	8/7/2024	<b>4</b>		
<b>42</b>	9/7/2024	2	other types of grippers	9/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>43</b>	10/7/2024	3	tools as end effectors, robot/end effector interface	10/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>44</b>	12/7/2024	1	tools as end effectors, robot/end effector interface	12/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>45</b>	13/7/2024	4	Robot Programming: Methods of robot programming	13/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>46</b>	15/7/2024	2	lead-through programming methods	15/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>47</b>	16/7/2024	3	a robot program as a path in space,	16/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>48</b>	19/7/2024	1	motion interpolation, wait, signal and delay commands, branching	19/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>49</b>	22/7/2024	4	capabilities and limitations of lead-through methods, problems	22/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>50</b>	23/7/2024	2	Artificial Intelligence (AI): Introduction & goals of AI in research, AI techniques	23/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>51</b>	24/7/2024	3	LISP programming, AI & robotics, LISP in factory, robotic paradigms, problems.	24/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>52</b>	25/7/2024	<b>CIE 3</b>					
<b>53</b>	26/7/2024						
<b>54</b>	27/7/2024						
<b>55</b>	29/7/2024	<b>1</b>	Robot Cell Design & Control: Robot cell layouts, multiple robots and machine interference	29/7/2024	<b>1</b>	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>56</b>	30/7/2024	4	considerations in	30/7/2024	4	<b>T1, R2</b>	<b>Smart</b>

			work -cell design,				board , ppt
57	31/7/2024	2	work-cell control, interlocks, error detection and recovery, work -cell controller	31/7/2024	2	T1, R2	Smart board , ppt
58	31/7/2024	3	.cycle time analysis, graphic simulation of robotic work cells, problems.	31/7/2024	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	7/6/2024
2	Seminar	23/7/2024

#### Text Books:

1. Mikell P. Groover, Mitchel Weiss, Roger N. Nagel, Nicholas G. Odrey and Ashish Dutta, "Industrial Robotic

#### Reference Book:

1. Roland Siegwart, Illah R. Nourbakhsh, and Davide Scaramuzza, "Introduction to Autonomous Mobile Robots", 2n Edition, PHI, 2011.



  
**Prof. & HOD**  
 Department of Mechatronics  
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 Bio-Channahalli, Bangalore - 560 076

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)**MECHATRONICS ENGINEERING**  
**LESSON PLAN****Faculty Name: Ms. Seema V****Academic Year: 22/4/2024 to 7/8/2024****SUB.CODE & Name: Hydraulics and Pneumatics (BMT405B)****Year/Sem/Section: 2<sup>nd</sup> / IV**

**COURSE OBJECTIVES** This course will enable the students to  
CLO1. To provide students with good depth of knowledge of Industrial IoT systems for various applications.  
CLO2. Knowledge for the design and analysis of industry 4.0 systems.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain the Knowledge of architecture , revolution of Industrial IoT System
<b>CO2</b>	Identify, formulate and solve engineering problems by using Industrial IoT.
<b>CO3</b>	Identify the technologies for IIOT
<b>CO4</b>	Analyse the different communication protocols fro IIOT applications
<b>CO5</b>	Ability to implement real field problem by gained knowledge of Industrial applications

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/2024	2	<b>Introduction to Industrial IoT (IIoT) Systems</b>	22/4/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
2.	23/4/2024	4	The Various Industrial Revolutions	23/4/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
3.	24/4/2024	1	The Various Industrial Revolutions	24/4/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>

4.	26/4/2024	2	The Various Industrial Revolutions	26/4/2024	2	T1, R2	Smart board , ppt
5.	29/4/2024	2	The Various Industrial Revolutions	29/4/2024	2	T1, R2	Smart board , ppt
6.	3/5/2024	4	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	3/5/2024	4	T1, R2	Smart board , ppt
7.	6/5/2024	1	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	6/5/2024	1	T1, R2	Smart board , ppt
8.	7/5/2024	2	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	7/5/2024	2	T1, R2	Smart board , ppt
9.	8/5/2024	2	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	8/5/2024	2	T1, R2	Smart board , ppt
10	13/5/2024	4	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	13/5/2024	4	T1, R2	Smart board , ppt
11	14/5/2024	1	Industry 4.0 revolutions	14/5/2024	1	T1, R2	Smart board , ppt
12	15/5/2024	2	Industry 4.0 revolutions	15/5/2024	2	T1, R2	Smart board , ppt
13	17/5/2024	2	Industry 4.0 revolution	17/5/2024	2	T1, R2	Smart board , ppt
14	20/5/2024	4	IIOT architecture, Support System for Industry 4.0 Smart Factories.	20/5/2024	4	T1, R2	Smart board , ppt
15	21/5/2024	1	IIOT architecture, Support System for Industry 4.0 Smart Factories.	21/5/2024	1	T1, R2	Smart board , ppt
16	22/5/2024	2	IIOT architecture, Support System for Industry 4.0 Smart Factories.	22/5/2024	2	T1, R2	Smart board , ppt
17	24/5/2024	2	IIOT architecture, Support System for Industry 4.0 Smart Factories.	24/5/2024	2	T1, R2	Smart board , ppt
18	27/5/2024	4	IIOT architecture, Support System for Industry 4.0 Smart Factories.	27/5/2024	4	T1, R2	Smart board , ppt
19	28/5/2024	1	IIOT architecture, Support System for Industry 4.0 Smart Factories.	28/5/2024	1	T1, R2	Smart board , ppt
20	29/5/2024	2	IIOT architecture, Support System for Industry 4.0 Smart Factories.	29/5/2024	2	T1, R2	Smart board , ppt
21	31/5/2024	2	IIOT architecture, Support System for Industry 4.0 Smart Factories.	31/5/2024	2	T1, R2	Smart board , ppt
22	3/6/2024	4	<b>Implementation systems for IIoT:</b>	3/6/2024	4	T1, R2	Smart board , ppt
23	4/6/2024	1	<b>Implementation systems for IIoT:</b>	4/6/2024	1	T1, R2	Smart board , ppt



24	5/6/2024	2	<b>Implementation systems for IIoT:</b>	5/6/2024	2	T1, R2	Smart board , ppt
25	7/6/2024	2	<b>Implementation systems for IIoT:</b>	7/6/2024	2	T1, R2	Smart board , ppt
26	10/6/2024	<b>CIE 1</b>					
27	11/6/2024						
28	12/6/2024						
29	18/6/2024	4	Sensors and Actuators for Industrial Processes	18/6/2024	4	T1, R2	Smart board , ppt
30	19/6/2024	1	Sensors and Actuators for Industrial Processes	19/6/2024	1	T1, R2	Smart board , ppt
31	20/6/2024	2	Sensors and Actuators for Industrial Processes	20/6/2024	2	T1, R2	Smart board , ppt
32	21/6/2024	2	Sensors and Actuators for Industrial Processes	21/6/2024	2	T1, R2	Smart board , ppt
33	24/6/2024	4	actuators categories,	24/6/2024	4	T1, R2	Smart board , ppt
34	25/6/2024	1	Sensor categories	25/6/2024	1	T1, R2	Smart board , ppt
35	26/6/2024	2	Sensor categories	26/6/2024	2	T1, R2	Smart board , ppt
36	28/6/2024	2	<b>IIoT Technologies</b>	28/6/2024	2	T1, R2	Smart board , ppt
37	1/7/2024	4	<b>IIoT Technologies</b>	1/7/2024	4	T1, R2	Smart board , ppt
38	2/7/2024	1	introduction, augmented reality	2/7/2024	1	T1, R2	Smart board , ppt
39	3/7/2024	2	introduction, augmented reality	3/7/2024	2	T1, R2	Smart board , ppt
40	5/7/2024	2	introduction, augmented reality	5/7/2024	2	T1, R2	Smart board , ppt
41	8/7/2024	4	virtual reality, big data and advanced analytics	8/7/2024	4	T1, R2	Smart board , ppt
42	9/7/2024	1	virtual reality, big data and advanced analytics	9/7/2024	1	T1, R2	Smart board , ppt
43	10/7/2024	2	smart factories, lean manufacturing system.	10/7/2024	2	T1, R2	Smart board , ppt
44	10/7/2024	2	smart factories, lean manufacturing system.	10/7/2024	2	T1, R2	Smart board , ppt
45	15/7/2024	4	smart factories, lean manufacturing system.	15/7/2024	4	T1, R2	Smart board , ppt
46	16/7/2024	1	<b>Industrial Transmission: Introduction Profibus</b>	16/7/2024	1	T1, R2	Smart board , ppt

47	19/7/2024	2	<b>Industrial Transmission:</b> Introduction Profibus	19/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
48	22/7/2024	2	<b>Industrial Transmission:</b> Introduction Profibus	22/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
49	23/7/2024	4	features,components, Fiels bus- features,components,	23/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
50	24/7/2024	1	features,components, Fiels bus- features,components,	24/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
51	26/7/2024	2	HART-features,components, CAN-features,components	26/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
52	29/7/2024	<b>CIE 2</b>					
53	30/7/2024						
54	31/7/2024						
55	5/8/2024	2	<b>IHOT case studies:</b> Health care and applications, Oil and Gas Industry	5/8/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
56	6/8/2024	4	Smart Office, manufacturing industry, automotive industry.	6/8/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
57	7/8/2024	1	Smart Office, manufacturing industry, automotive industry.	7/8/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignments	19/6/2024
2	Class presentations	2/8/2024

**Text Books:**

1. Misra, S., Mukherjee, A., & Roy, A. (2021). Forntmatter. In Introduction to IoT , Cambridge University Press.

**Reference Book:**

1. Industry 4.0: The Industrial Internet of Things Alasdair GilchristPublications



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
He. Channarayana, Bangalore - 560 008

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**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Ms. Seema V**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: MICROCONTROLLER AND APPLICATIONS (BMT401)**

**Year/Sem/Section: 2<sup>nd</sup> / IV**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Microcontrollers, microprocessors, Different memory Architecture, interfacing techniques and 8051 architectures.

CLO2. Assembly language instructions, data types and application programming.

CLO3. C language instructions, data types and application programming, generating delays for different Time delay.

CLO4. Serial communication between two devices using assembly and C language programming, Interrupt handling and counter application using assembly and C language.

CLO5. The controller to real-world devices such as switches, display devices, motors, converters etc.

**COURSE OUTCOMES:**

<b>CO1</b>	Describe the architecture of 8051 Microcontroller, microprocessor and internal memory organization, types.
<b>CO2</b>	Apply various instruction set of assembly and C language for different software and hardware applications.
<b>CO3</b>	Calculate time delays, baud rates and analyze Timer. Counter operation and Transmission of data serially for different modes of operation.
<b>CO4</b>	Design the hardware interface between microcontroller and memories of different size, external peripheral devices for real time application.
<b>CO5</b>	The controller to real-world devices such as switches, display devices, motors, converters etc.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/2024	4	Introduction, Microprocessors and Microcontrollers	22/4/2024	4	T1, R2	Smart board , ppt
2.	24/4/2024	2	A Microprocessors survey. RISC & CISC CPU Architectures	24/4/2024	2	T1, R2	Smart board , ppt
3.	25/4/2024	1	Harvard & Von-Neumann CPU architecture	25/4/2024	1	T1, R2	Smart board , ppt
4.	26/4/2024	4	The 8051 Architecture: Introduction,	26/4/2024	4	T1, R2	Smart board , ppt
5.	29/5/2024	4	8051 Microcontroller	29/5/2024	4	T1, R2	Smart board , ppt
6.	2/6/2024	2	Input / Output Pins, Ports and Internal Memory organization	2/6/2024	2	T1, R2	Smart board , ppt
7.	3/6/2024	1	Input / Output Pins, Ports and Internal Memory organization	3/6/2024	1	T1, R2	Smart board , ppt
8.	6/5/2024	4	External Memory (ROM & RAM) Interfacing	6/5/2024	4	T1, R2	Smart board , ppt
9.	8/5/2024	4	External Memory (ROM & RAM) Interfacing	8/5/2024	4	T1, R2	Smart board , ppt
10	9/5/2024	2	Introduction, addressing modes	9/5/2024	2	T1, R2	Smart board , ppt
11	13/5/2024	1	Introduction, addressing modes	13/5/2024	1	T1, R2	Smart board , ppt
12	15/5/2024	4	External data Moves,	15/5/2024	4	T1, R2	Smart board , ppt
13	16/5/2024	4	External data Moves,	16/5/2024	4	T1, R2	Smart board , ppt
14	17/5/2024	2	Code Memory,	17/5/2024	2	T1, R2	Smart board , ppt
15	20/5/2024	1	Read Only Data Moves / Indexed Addressing Mode	20/5/2024	1	T1, R2	Smart board , ppt
16	22/5/2024	4	Read Only Data Moves / Indexed Addressing Mode	22/5/2024	4	T1, R2	Smart board , ppt
17	23/5/2024	4	PUSH and POP Opcodes	23/5/2024	4	T1, R2	Smart board , ppt
18	24/5/2024	2	Data exchanges, Byte level logical Operations	24/5/2024	2	T1, R2	Smart board , ppt
19	27/5/2024	1	Bit level Logical Operations	27/5/2024	1	T1, R2	Smart board , ppt
20	29/5/2024	4	Rotate and Swap Operations,	29/5/2024	4	T1, R2	Smart board , ppt

21	30/5/2024	4	incrementing and Decrementing, Addition, Subtraction, Multiplication and Division, Decimal Arithmetic.	30/5/2024	4	T1, R2	Smart board , ppt
22	31/5/2024	2	JUMP and CALL Program range, Jumps, calls and Subroutines, Interrupts and Returns.	31/5/2024	2	T1, R2	Smart board , ppt
23	3/6/2024	1	Data types and time delays in 8051C	3/6/2024	1	T1, R2	Smart board , ppt
24	5/6/2024	4	I/O programming	5/6/2024	4	T1, R2	Smart board , ppt
25	6/6/2024	4	logic operations	6/6/2024	4	T1, R2	Smart board , ppt
26	7/6/2024	2	data conversion programs	7/6/2024	2	T1, R2	Smart board , ppt
27	10/6/2024	CIE 1					
28	11/6/2024	CIE 1					
29	12/6/2024	CIE 1					
30	19/6/2024	2	Timer / Counter Programming in 8051: Programming 8051 Timers, modes of Timer	19/6/2024	2	T1, R2	Smart board , ppt
31	20/6/2024	1	Basics of Serial Communication	20/6/2024	1	T1, R2	Smart board , ppt
32	21/6/2024	4	8051 connections to RS-232	21/6/2024	4	T1, R2	Smart board , ppt
33	24/6/2024	4	8051 Serial communication Programming	24/6/2024	4	T1, R2	Smart board , ppt
34	26/6/2024	2	Programming the second serial port	26/6/2024	2	T1, R2	Smart board , ppt
35	27/6/2024	1	Serial port programming in C.	27/6/2024	1	T1, R2	Smart board , ppt
36	28/6/2024	4	Interrupts Programming,8051 Interrupts, Programming Timer Interrupts	28/6/2024	4	T1, R2	Smart board , ppt
37	2/7/2024	4	Interrupts Programming,8051 Interrupts, Programming Timer Interrupts	2/7/2024	4	T1, R2	Smart board , ppt
38	1/7/2024	2	Interrupts Programming,8051 Interrupts, Programming Timer Interrupts	1/7/2024	2	T1, R2	Smart board , ppt
39	3/7/2024	1	Interrupt Priority in the 8051/52	3/7/2024	1	T1, R2	Smart board , ppt
40	4/7/2024	4	Interrupt Priority in the 8051/52	4/7/2024	4	T1, R2	Smart board , ppt
41	5/7/2024	4	Interrupt Priority in the 8051/52	5/7/2024	4	T1, R2	Smart board , ppt
42	10/7/2024	2	8051 Interfacing and Applications	10/7/2024	2	T1, R2	Smart



							board , ppt
43	8/7/2024	1	8051 Interfacing and Applications	8/7/2024	1	T1, R2	Smart board , ppt
44	10/7/2024	4	8051 Interfacing and Applications	10/7/2024	4	T1, R2	Smart board , ppt
45	11/7/2024	4	Hardware & Software	11/7/2024	4	T1, R2	Smart board , ppt
46	12/7/2024	2	Hardware & Software	12/7/2024	2	T1, R2	Smart board , ppt
47	15/7/2024	1	(Assembly code / C code) Interfacing of 8051 to simple switches and LEDs	15/7/2024	1	T1, R2	Smart board , ppt
48	18/7/2024	4	(Assembly code / C code) Interfacing of 8051 to simple switches and LEDs	18/7/2024	4	T1, R2	Smart board , ppt
49	19/7/2024	4	(Assembly code / C code) Interfacing of 8051 to simple switches and LEDs	19/7/2024	4	T1, R2	Smart board , ppt
50	22/7/2024	2	LCD, ADC	22/7/2024	2	T1, R2	Smart board , ppt
51	24/7/2024	1	LCD, ADC	24/7/2024	1	T1, R2	Smart board , ppt
52	25/7/2024	4	Stepper motor	25/7/2024	4	T1, R2	Smart board , ppt
53	26/7/2024	4	Stepper motor	26/7/2024	4	T1, R2	Smart board , ppt
54	29/7/2024			CIE 2			
55	30/7/2024			CIE 2			
56	31/7/2024			CIE 2			
57	1/8/2024	4	DC motor	1/8/2024	4	T1, R2	Smart board , ppt
58	2/8/2024	2	Temperature sensor	2/8/2024	2	T1, R2	Smart board , ppt
59	5/8/2024	1	Wave form generation	5/8/2024	1	T1, R2	Smart board , ppt
60	7/8/2024	4	Revision	7/8/2024	4	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Faculty can choose any two of the following:

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	Assignments	<b>19/6/2024</b>
2	Class presentations	<b>2/8/2024</b>

**Text Books:** “The 8051 Microcontroller Architecture, Programming & Applications”, 2e Kenneth J.

Ayala;Penram International, 1996 / Thomson Learning 2005

**Reference Book:** “Programming and Customizing the 8051 Microcontroller” Predko ;-, TMH



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Itanagarahalli, Bangalore - 560 065

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### MECHATRONICS ENGINEERING

#### LESSON PLAN

**Faculty Name:** Mr.JAIDEEP R

**Academic Year:** 15/11/23 to 20/2/24

**SUB.CODE & Name:** UHV 1 BSCK307

**Year/Sem/Section:** 2<sup>nd</sup> / 3<sup>RD</sup> SEM

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

CLO2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence.

CLO3: Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.

CLO4: To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction .

#### **COURSE OUTCOMES:**

<b>CO1</b>	Enable the student to do a deep drive into societal challenges being addressed by NGO(s), social enterprises.
<b>CO2</b>	Build solutions to alleviate these complex social problems through immersion, design & technology.
<b>CO3</b>	Provide a formal platform for students to communicate and connect with their surroundings.
<b>CO4</b>	Enable to create of a responsible connection with society.
<b>CO5</b>	Organizing a food walk.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	17/11/23	6	Plantation and adoption of a tree: Plantation of a tree that will be adopted for four years by a group of B.Tech. students.	17/11/23	6	T1, R2	Smart board , ppt
2.	24/11/23	6	photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.	24/11/23	6	T1, R2	Smart board , ppt
3.	1/12/23	6	photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.	1/12/23	6	T1, R2	Smart board , ppt
4.	1/12/23	6	Heritage walk and crafts corner: Heritage tour, knowing the history and culture of the city	1/12/23	6	T1, R2	Smart board , ppt
5.	8/12/23	6	connecting to people around through their history,	8/12/23	6	T1, R2	Smart board , ppt
6.	15/12/23	6	knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.	15/12/23	6	T1, R2	Smart board , ppt
7.	22/12/23	6	Organic farming and waste management: usefulness of organic farming,	22/12/23	6	T1, R2	Smart board , ppt
8.	26/12/23	<b>CIE 1</b>					
9.	27/12/23						
10.	28/12/23						
11.	29/12/23						
12.	5/1/24						
13.	12/1/24	6	wet waste management in neighboring villages and implementation in the campus.	12/1/24	6	T1, R2	Smart board , ppt
14.	19/1/24	6	Water Conservation: knowing the present practices in the surrounding villages and implementation in the campus, documentary or photo blog presenting the current practices.	19/1/24	6	T1, R2	Smart board , ppt
15.	2/2/24	6	Food Walk City's culinary practices, food lore, and indigenous materials of the region used in cooking.	2/2/24	6	T1, R2	Smart board , ppt

16	9/2/24	6	Food Walk City's culinary practices, food lore, and indigenous materials of the region used in cooking.	9/2/24	6	T1, R2	Smart board , ppt
17	12/2/24	CIE 2					
18	13/2/24						
19	14/2/24						
20	15/2/24						
21	16/2/24	6	Food Walk City's culinary practices, food lore, and indigenous materials of the region used in cooking.	16/2/24	6	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

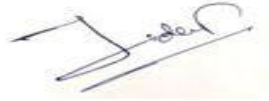
Faculty can choose any two of the following:

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- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignments	15/12/2023
2	Class presentations	9/2/2024

**Text Books:** Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

**Reference Book:** Jeevan Vidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999



**Faculty**



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### MECHATRONICS ENGINEERING

#### LESSON PLAN

**Faculty Name: Ms. Seema V**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: UHV**

**Year/Sem/Section: 2<sup>nd</sup> / IV**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

CLO2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence.

CLO3: Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.

CLO4: To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction .

#### **COURSE OUTCOMES:**

<b>CO1</b>	To help the students appreciate the essential complementarity 'VALUES' to ensure sustained happiness and prosperity which are the core aspirations of all human beings
<b>CO2</b>	To help the students appreciate the essential complementarity 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
<b>CO3</b>	To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence.
<b>CO4</b>	holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
<b>CO5</b>	To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/2024	5	Introduction to Value Education	22/4/2024	5	T1, R2	Smart board , ppt
2.	29/4/2024	5	Introduction to Value Education	29/4/2024	5	T1, R2	Smart board , ppt
3.	6/5/2024	5	Introduction to Value Education	6/5/2024	5	T1, R2	Smart board , ppt
4.	13/5/2024	5	Harmony in the Human Being	13/5/2024	5	T1, R2	Smart board , ppt
5.	20/5/2024	5	Harmony in the Human Being	20/5/2024	5	T1, R2	Smart board , ppt
6.	27/5/2024	5	Harmony in the Human Being	27/5/2024	5	T1, R2	Smart board , ppt
7.	3/6/2024	5	Harmony in the Family and Society	3/6/2024	5	T1, R2	Smart board , ppt
8.	10/6/2024	<b>CIE 1</b>					
9.	11/6/2024						
10.	12/6/2024						
11.	24/6/2024	5		24/6/2024	5	T1, R2	Smart board , ppt
12.	1/7/2024	5	Harmony in the Family and Society	1/7/2024	5	T1, R2	Smart board , ppt
13.	8/7/2024	5	Harmony in the Nature/Existence	8/7/2024	5	T1, R2	Smart board , ppt
14.	15/7/2024	5	Harmony in the Nature/Existence	15/7/2024	5	T1, R2	Smart board , ppt
15.	22/7/2024	5	Implications of the Holistic Understanding – a Look at Professional Ethics	22/7/2024	5	T1, R2	Smart board , ppt
16.	29/7/2024	<b>CIE 2</b>					
17.	30/7/2024						
18.	31/7/2024						
19.	5/8/2024	5	Implications of the Holistic Understanding – a Look at Professional Ethics	5/8/2024	5	T1, R2	Smart board , ppt

**Continuous and Comprehensive Evaluation (CCE)**

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignments	20/5/2024
2	Class presentations	22/7/2024

**Text Books:** Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

**Reference Book:** Jeevan Vidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999



**Faculty**



**Prof. & HOD**  
 Department of Mechatronics  
 The Oxford College Of Engineering  
 Hebbalahalli, Bangalore - 560 066



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name:** Ms. SEEMA V

**Academic Year:** 12/2/24 – 11/5/24

**SUB.CODE & Name:** MANAGEMENT INFORMATION SYSTEM 18MT824

**Year/Sem/Section:** 4<sup>TH</sup> / 8<sup>TH</sup> SEM

**COURSE OBJECTIVES** This course will enable the students to  
CLO1. Gain the importance of business.  
CLO2. Understand the importance used for effective decision making.  
CLO3. Understand the importance of applications in business.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain the importance of information in business.
<b>CO2</b>	Have knowledge on effective applications of information systems in business.
<b>CO3</b>	Understand the technologies used for effective decision making in an organization.
<b>CO4</b>	Understand the methods used for effective decision making in an organization.
<b>CO5</b>	Understand the applications for effective decision making in an organization.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/2/24	1	Data, Information	15/2/24	1	T1, R2	Smart board , ppt
2.	16/2/24	4	Intelligence, Information Technology	16/2/24	4	T1, R2	Smart board , ppt
3.	22/2/24	2	Information System, evolution,	22/2/24	2	T1, R2	Smart board , ppt
4.	23/2/24	4	types based on functions and hierarchy	23/2/24	4	T1, R2	Smart board , ppt
5.	29/2/24	1	System development methodologies	29/2/24	1	T1, R2	Smart

			, Functional Information Systems.				board , ppt
6.	1/3/24	4	System development methodologies , Functional Information Systems.	1/3/24	4	T1, R2	Smart board , ppt
7.	7/3/24	2	DSS, EIS, KMS, GIS	7/3/24	2	T1, R2	Smart board , ppt
8.	11/3/24	<b>CIE 1</b>					
9.	12/3/24						
10	13/3/24						
11	14/3/24	4	International Information System.	14/3/24	4	T1, R2	Smart board , ppt
12	15/3/24	1	SYSTEM ANALYSIS AND DESIGN: introduction.	15/3/24	1	T1, R2	Smart board , ppt
13	21/3/24	4	Case tools	21/3/24	4	T1, R2	Smart board , ppt
14	22/3/24	2	System flow chart	22/3/24	2	T1, R2	Smart board , ppt
15	28/3/24	4	Decision table	28/3/24	4	T1, R2	Smart board , ppt
16	4/4/24	<b>CIE 2</b>					
17	5/4/24						
18	6/4/24						
19	12/4/24	1	Data flow Diagram (DFD	12/4/24	1	T1, R2	Smart board , ppt
20	18/4/24	4	Entity Relationship (ER)	18/4/24	4	T1, R2	Smart board , ppt
21	19/4/24	2	Object Oriented Analysis	19/4/24	2	T1, R2	Smart board , ppt
22	25/4/24	4	Design (OOAD)	25/4/24	4	T1, R2	Smart board , ppt
23	26/4/24	1	UML diagram.	26/4/24	1	T1, R2	Smart board , ppt
24	2/5/24	4	DATABASE MANAGEMENT SYSTEMS : introduction.	2/5/24	4	T1, R2	Smart board , ppt
25	3/5/24	2	DBMS	3/5/24	2	T1, R2	Smart board , ppt
26	6/5/24	<b>CIE 3</b>					
27	7/5/24						
28	8/5/24						
29	9/5/24	4	HDBMS	9/5/24	4	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	7/3/24
2	ASSIGNMENT	28/3/24
3	ASSIGNMENT	2/5/24

**Text Books:**

1. Management Information Systems Mcgraw hill 2012.

**Reference Book:**

1. Management Information Systems for the Information Age Mc Cubbrey, McGraw Hill 2010.

*Seema*

**Faculty**

*Prof.*

**Prof. & HOD**  
**Department of Mechatronics**  
**The Oxford College Of Engineering**  
 Hebbal, Bangalore - 560 076



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**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 15/11/23 to 20/2/24**

**SUB.CODE & Name: MECHANICS OF SOLIDS AND FLUIDS 21MT34**

**Year/Sem/Section: 2<sup>ND</sup> / 3<sup>RD</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Gain knowledge of linear elastic properties and stress strain relations.

CLO2. Derive and solve problems on Principal stresses developed in structures.

CLO3. Compute the stress strain for bars, beams, shafts, and column and to apply the concept of dynamic similarity and to apply it to experimental modelling.

CLO4. Gain knowledge of basic properties of fluids, fluid statics.

CLO5: To apply conservation of mass, momentum and energy equation.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain the knowledge of properties, and stress-strain relations in linear elastic solid members and fluids. To understand the concepts of fluid statics, kinematics and dynamics.
<b>CO2</b>	Describe stress-strain equation for axial, bending and torsion loads while addressing problems in engineering
<b>CO3</b>	Apply the concepts of fluid statics, kinematics and dynamics while addressing problems in engineering and to determine the fluid flow through open and closed channel.
<b>CO4</b>	Determine the stress & strain for simple stresses, compound stresses, shafts & columns.
<b>CO5</b>	To apply conservation of mass, momentum and energy equation and to determine the discharge of fluid flow.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11/23	4	Simple Stress and Strain: Introduction	15/11/23	4	T1, R2	Smart board , ppt
2.	16/11/23	4	Concept of Stress and Strain, Linear elasticity, Hooke's Law and Poisson's ratio.	16/11/23	4	T1, R2	Smart board , ppt
3.	16/11/23	3	Concept of Stress and Strain, Linear elasticity, Hooke's Law and Poisson's ratio.	16/11/23	3	T1, R2	Smart board , ppt
4.	17/11/23	1	Concept of Stress and Strain, Linear elasticity,	17/11/23	1	T1, R2	Smart board , ppt
5.	17/11/23	3	Extension / Shortening of a bar, bars with varying cross sections	17/11/23	3	T1, R2	Smart board , ppt
6.	20/11/23	4	Extension / Shortening of a bar, bars with varying cross sections	20/11/23	4	T1, R2	Smart board , ppt
7.	21/11/23	4	Extension / Shortening of a bar, bars with varying cross sections	21/11/23	4	T1, R2	Smart board , ppt
8.	22/11/23	3	Elongation due to self-weight	22/11/23	3	T1, R2	Smart board , ppt
9.	23/11/23	1	Elongation due to self-weight	23/11/23	1	T1, R2	Smart board , ppt
10	24/11/23	3	Principle of super position, St. Venant's Principle.	24/11/23	3	T1, R2	Smart board , ppt
11	24/11/23	4	expression for volumetric strain	24/11/23	4	T1, R2	Smart board , ppt
12	24/11/23	4	Elastic Constants and relations.	24/11/23	4	T1, R2	Smart board , ppt
13	27/11/23	3	Stresses in Composite Section	27/11/23	3	T1, R2	Smart board , ppt
14	28/11/23	1	Compound Stresses: Introduction	28/11/23	1	T1, R2	Smart board , ppt
15	28/11/23	3	Concept of Plane stress, Stress tensor for plane stress	28/11/23	3	T1, R2	Smart board , ppt
16	29/11/23	4	Concept of Plane stress, Stress tensor for plane stress	29/11/23	4	T1, R2	Smart board , ppt
17	29/11/23	4	stresses on inclined sections	29/11/23	4	T1, R2	Smart board , ppt
18	1/12/23	3	stresses on inclined sections	1/12/23	3	T1, R2	Smart board , ppt
19	1/12/23	1	principal stresses and	1/12/23	1	T1, R2	Smart

			maximum shear stresses,				board , ppt
20	4/12/23	3	Mohr's circle for plane stress.	4/12/23	3	T1, R2	Smart board , ppt
21	5/12/23	4	Mohr's circle for plane stress.	5/12/23	4	T1, R2	Smart board , ppt
22	6/12/23	4	Torsion of Circular Shafts: Introduction Pure torsion, assumptions,	6/12/23	4	T1, R2	Smart board , ppt
23	7/12/23	3	derivation of torsional equations,	7/12/23	3	T1, R2	Smart board , ppt
24	8/12/23	1	Polar modulus, torsional rigidity / stiffness of shafts	8/12/23	1	T1, R2	Smart board , ppt
25	11/12/23	3	Power transmitted by solid shaft	11/12/23	3	T1, R2	Smart board , ppt
26	12/12/23	4	Euler's theory for axially loaded elastic long columns	12/12/23	4	T1, R2	Smart board , ppt
27	13/12/23	4	Derivation of Euler's load for various end conditions	13/12/23	4	T1, R2	Smart board , ppt
28	14/12/23	3	limitations of Euler's theory, Rankine's formula.	14/12/23	3	T1, R2	Smart board , ppt
29	15/12/23	1	introduction to Fluid mechanics: Introduction, Properties of fluids- mass density, weight density, specific volume, specific gravity, viscosity, surface tension, capillarity	15/12/23	1	T1, R2	Smart board , ppt
30	18/12/23	3	vapour pressure, compressibility and bulk modulus. Concept	18/12/23	3	T1, R2	Smart board , ppt
31	19/12/23	4	vapour pressure, compressibility and bulk modulus. Concept	19/12/23	4	T1, R2	Smart board , ppt
32	20/12/23	4	vapour pressure, compressibility and bulk modulus. Concept	20/12/23	4	T1, R2	Smart board , ppt
33	21/12/23	3	types of fluids pressure at a point in the static mass of fluid, variation of pressure	21/12/23	3	T1, R2	Smart board , ppt
34	22/12/23	1	types of fluids pressure at a point in the static mass of fluid, variation of pressure	22/12/23	1	T1, R2	Smart board , ppt
35	26/12/23	CIE 1					
36	27/12/23						
37	28/12/23						
38	29/12/23						
39	1/1/24	3	. types of fluids pressure at a point in the static mass of fluid, variation of pressure	1/1/24	3	T1, R2	Smart board , ppt
40	2/1/24	4	Pascal's law, absolute, gauge,	2/1/24	4	T1, R2	Smart

			atmospheric and vacuum pressures; pressure measurement by simple,				board , ppt
41	3/1/24	4	Pascal's law, absolute, gauge, atmospheric and vacuum pressures; pressure measurement by simple,	3/1/24	4	T1, R2	Smart board , ppt
42	4/1/24	3	Total pressure and centre of pressure for horizontal plane,	4/1/24	3	T1, R2	Smart board , ppt
43	5/1/24	1	Total pressure and centre of pressure for horizontal plane,	5/1/24	1	T1, R2	Smart board , ppt
44	8/1/24	3	vertical plane surface and inclined plane surface submerged in static fluid.	8/1/24	3	T1, R2	Smart board , ppt
45	9/1/24	4	vertical plane surface and inclined plane surface submerged in static fluid.	9/1/24	4	T1, R2	Smart board , ppt
46	10/1/24	4	Fluid Kinematics: Velocity of fluid particle, types of fluid flow, description of flow	10/1/24	4	T1, R2	Smart board , ppt
47	11/1/24	3	continuity equation, Coordinate free form, acceleration of fluid particle	11/1/24	3	T1, R2	Smart board , ppt
48	12/1/24	1	continuity equation, Coordinate free form, acceleration of fluid particle	12/1/24	1	T1, R2	Smart board , ppt
49	16/1/24	3	continuity equation, Coordinate free form, acceleration of fluid particle	16/1/24	3	T1, R2	Smart board , ppt
50	17/1/24	4	rotational & irrotational flow, equation in velocity potential	17/1/24	4	T1, R2	Smart board , ppt
51	18/1/24	4	rotational & irrotational flow, equation in velocity potential	18/1/24	4	T1, R2	Smart board , ppt
52	19/1/24	3	Poisson's equation in stream function, flownet.	19/1/24	3	T1, R2	Smart board , ppt
53	22/1/24	1	Fluid Dynamics; Introduction. Forces acting on fluid in motion. Euler's equation of motion along a streamline	22/1/24	1	T1, R2	Smart board , ppt
54	23/1/24	3	Fluid Dynamics; Introduction. Forces acting on fluid in motion. Euler's equation of motion along a streamline	23/1/24	3	T1, R2	Smart board , ppt
55	24/1/24	4	Integration of Euler's equation to obtain Bernoulli's equation	24/1/24	4	T1, R2	Smart board , ppt
56	25/1/24	4	Integration of Euler's equation to obtain Bernoulli's equation	25/1/24	4	T1, R2	Smart board , ppt
57	29/1/24	3	Assumptions and limitations of Bernoulli's equation. Major head	29/1/24	3	T1, R2	Smart board , ppt

			loss				
58	30/1/24	1	Introduction to Navier-Stokes equation. Application of Bernoulli's theorem	30/1/24	1	T1, R2	Smart board , ppt
59	31/1/24	3	Introduction to Navier-Stokes equation. Application of Bernoulli's theorem	31/1/24	3	T1, R2	Smart board , ppt
60	1/2/24	4	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube.	1/2/24	4	T1, R2	Smart board , ppt
61	2/2/24	4	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube.	2/2/24	4	T1, R2	Smart board , ppt
62	5/2/24	3	venturi-meter, orifice meter, rectangular and triangular notch, pitot tube	5/2/24	3	T1, R2	Smart board , ppt
63	6/2/24	1	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube. Problems	6/2/24	1	T1, R2	Smart board , ppt
64	7/2/24	3	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube. Problems	7/2/24	3	T1, R2	Smart board , ppt
65	8/2/24	4	venturi-meter, orifice meter, rectangular and triangular notch, pitot tube Problems	8/2/24	4	T1, R2	Smart board , ppt
66	9/2/24	4	Revision	9/2/24	4	T1, R2	Smart board , ppt
67	12/2/24	<b>CIE 2</b>					
68	13/2/24						
69	14/2/24						
70	15/2/24						
71	16/2/24	3	Revision	16/2/24	3	T1, R2	Smart board , ppt
72	19/2/24	1	Revision	19/2/24	1	T1, R2	Smart board , ppt
73	20/2/24	3	Revision	20/2/24	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

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- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes



- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	21/12/2023
2	SEMINAR	8/2/2024

**Text Books:**

1. Mechanics of Materials Ferdinand Beer & Russell Johnston 2003.

**Reference Book:**

1. Mechanics of Materials Ferdinand Beer & Russell Johnston 2003.



**Faculty**



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**DEPARTMENT OF SCIENCE AND HUMANITIES**

**LESSON PLAN - ACADEMIC YEAR 2023-2024 (EVEN)**

**Date: 28.03.2024**

**FACULTY: Dr. B. KUPPULINGAM**

**SEM: II**

**SUB: Applied Physics for ME Stream**

**BRANCH: ME/MT**

**SECTION: P5**

**SUB.CODE: BPHYM202**

**Course Objectives:** The course will enable the students to,

**CLO1:** To understand the types of oscillation, shock waves & its generation, and applications.

**CLO2:** To Study the elastic properties of materials and failures of engineering materials

**CLO3:** To understand the fundamentals of thermoelectric materials and devices and their application.

**CLO4:** To understand the Concepts in Low temperature phenomena and generation of low temperature.

**CLO5:** To study the various relevant material characterization techniques.

COs	BPHYM202
CO1	Elucidate the concepts in oscillations, waves, elasticity and material failures
CO2	Discuss the fundamentals of Thermoelectric materials and their application
CO3	Summarize the low temperature phenomena and generation of low temperature
CO4	Explain the various material characterization techniques
CO5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements

Sl. No.	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	11.03.24	1 <sup>st</sup>	<b>Module-1</b> <b>Oscillations:</b> Introduction to Simple Harmonic motion (SHM)	11.03.24	1 <sup>st</sup>	T1	Chalk and Board/ Smart Board
2	12.03.24	2 <sup>nd</sup>	Differential equation for SHM	12.03.24	2 <sup>nd</sup>	T1	Chalk and Board/ Smart Board
3	13.03.24	3 <sup>rd</sup>	Springs: Stiffness Factor and its Physical Significance	13.03.24	3 <sup>rd</sup>	T1	Chalk and Board/ Smart

							Board
4	14.03.24	2 <sup>nd</sup>	Series and Parallel combination of springs (Derivation)	14.03.24	2 <sup>nd</sup>	T1	Chalk and Board/ Smart Board
5	15.03.24	6 <sup>th</sup>	Types of Springs and their applications	15.03.24	6 <sup>th</sup>	T1	Chalk and Board/ Smart Board
6	18.03.24	1 <sup>st</sup>	Theory of Damped oscillations	18.03.24	1 <sup>st</sup>	T1	Chalk and Board/ Smart Board
7	19.03.24	2 <sup>nd</sup>	Types of Damping (Graphical Approach)	19.03.24	2 <sup>nd</sup>	T1	Chalk and Board/ Smart Board
8	20.03.24	3 <sup>rd</sup>	Engineering applications of Damped oscillations	20.03.24	3 <sup>rd</sup>	T1	Chalk and Board/ Smart Board
9	21.03.24	2 <sup>nd</sup>	Theory of Forced oscillations	21.03.24	2 <sup>nd</sup>	T1	Chalk and Board/ Smart Board
10	22.03.24	6 <sup>th</sup>	Resonance, Sharpness of resonance	22.03.24	6 <sup>th</sup>	T1	Chalk and Board/ Smart Board
11	23.03.24	1 <sup>st</sup>	Numerical Problems in module-1	23.03.24	1 <sup>st</sup>	T1	Chalk and Board/ Smart Board
12	25.03.24	1 <sup>st</sup>	Numerical Problems in module-1	25.03.24	1 <sup>st</sup>	T1	Chalk and Board/ Smart Board
13	26.03.24	2 <sup>nd</sup>	<b>Shock waves:</b> Mach number and Mach Angle, Mach Regimes, Definition and Characteristics of Shock waves	26.03.24	2 <sup>nd</sup>	T1	Chalk and Board/ Smart Board
14	27.03.24	3 <sup>rd</sup>	Construction and working of Reddy Shock tube, Applications of Shock Waves	27.03.24	3 <sup>rd</sup>	T1	Chalk and Board/ Smart Board
15	28.03.24	2 <sup>nd</sup>	<b>Module-2</b> <b>Elasticity:</b> Stress-Strain Curve, Stress hardening and softening	28.03.24	2 <sup>nd</sup>	T2	Chalk and Board/ Smart Board
16	30.03.24	2 <sup>nd</sup>	Elastic Moduli, Poisson's ratio	30.03.24	2 <sup>nd</sup>	T2	Chalk and Board/ Smart Board
17	01.04.24	1 <sup>st</sup>	Relation between $Y$ , $n$ and $\sigma$ (with derivation)	01.04.24	1 <sup>st</sup>	T2	Chalk and Board/ Smart Board
18	02.04.24	2 <sup>nd</sup>	Mention relation between $K$ , $Y$ , $\sigma$ limiting values of Poisson's ratio	02.04.24	2 <sup>nd</sup>	T2	Chalk and Board/ Smart Board
19	03.04.24	3 <sup>rd</sup>	Beams, Bending moment and derivation of expression	03.04.24	3 <sup>rd</sup>	T2	Chalk and Board/ Smart Board
20	04.04.24	2 <sup>nd</sup>	Cantilever and I section girder and their Engineering Applications	04.04.24	2 <sup>nd</sup>	T2	Chalk and Board/ Smart Board

21	05.04.24	6 <sup>th</sup>	Elastic materials	05.04.24	6 <sup>th</sup>	T2	Chalk and Board/ Smart Board
22	10.04.24	3 <sup>rd</sup>	Failures of engineering materials - Ductile fracture, Brittle fracture	10.04.24	3 <sup>rd</sup>	T2	Chalk and Board/ Smart Board
23	12.04.24	6 <sup>th</sup>	Stress concentration, Fatigue and factors affecting fatigue	12.04.24	6 <sup>th</sup>	T2	Chalk and Board/ Smart Board
24	15.04.24	1 <sup>st</sup>	Numerical problems in Module-2	15.04.24	1 <sup>st</sup>	T2	Chalk and Board/ Smart Board
25	16.04.24	2 <sup>nd</sup>	Numerical problems in Module-2	16.04.24	2 <sup>nd</sup>	T2	Chalk and Board/ Smart Board
26	17.04.24	3 <sup>rd</sup>	<b>Module-3</b> <b>Thermoelectric materials and devices:</b> Thermo emf and thermo current, Seeback effect, Peltier effect, Seeback and Peltier coefficients	17.04.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
27	18.04.24	2 <sup>nd</sup>	figure of merit (Mention Expression), laws of thermoelectricity	18.04.24	2 <sup>nd</sup>	R3, R4	Chalk and Board/ Smart Board
28	19.04.24	6 <sup>th</sup>	Expression for thermo emf in terms of T1 and T2	19.04.24	6 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
29	22.04.24	1 <sup>st</sup>	Construction and Working of Thermo couples	22.04.24	1 <sup>st</sup>	R3, R4	Chalk and Board/ Smart Board
30	23.04.24	2 <sup>nd</sup>	Construction and Working of thermopile	23.04.24	2 <sup>nd</sup>	R3, R4	Chalk and Board/ Smart Board
31	24.04.24	3 <sup>rd</sup>	Construction and Working of Thermoelectric generators (TEG)	24.04.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
32	25.04.24	2 <sup>nd</sup>	Construction and Working of Thermoelectric coolers (TEC)	25.04.24	2 <sup>nd</sup>	R3, R4	Chalk and Board/ Smart Board
33	06.05.24	1 <sup>st</sup>	low, mid and high temperature thermoelectric materials	06.05.24	1 <sup>st</sup>	R3, R4	Chalk and Board/ Smart Board
34	07.05.24	2 <sup>nd</sup>	Applications: Exhaust of Automobiles	07.05.24	2 <sup>nd</sup>	R3, R4	Chalk and Board/ Smart Board
35	08.05.24	3 <sup>rd</sup>	Applications of thermoelectric material in Refrigerator,	08.05.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
36	09.05.24	2 <sup>nd</sup>	Applications of thermoelectric material in Space Program (RTG)	09.05.24	2 <sup>nd</sup>	R3, R4	Chalk and Board/ Smart Board
37	10.05.24	4 <sup>th</sup>	Numerical Problems in module-3	10.05.24	4 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board

38	11.05.24	4 <sup>th</sup>	Numerical Problems in module-3	11.05.24	4 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
39	14.05.24	2 <sup>nd</sup>	<b>Module-4</b> <b>Cryogenics:</b> Production of low temperature - Joule Thomson effect (Derivation with 3 cases)	14.05.24	2 <sup>nd</sup>	R2	Chalk and Board/ Smart Board
40	15.05.24	3 <sup>rd</sup>	Porous plug experiment with theory	15.05.24	3 <sup>rd</sup>	R2	Chalk and Board/ Smart Board
41	16.05.24	2 <sup>nd</sup>	Thermo Dynamical Analysis of Joule Thomson effect	16.05.24	2 <sup>nd</sup>	R2	Chalk and Board/ Smart Board
42	17.05.24	6 <sup>th</sup>	Liquefaction of Oxygen by cascade process	17.05.24	6 <sup>th</sup>	R2	Chalk and Board/ Smart Board
43	20.05.24	1 <sup>st</sup>	Lindey's air liquefier process	20.05.24	1 <sup>st</sup>	R2	Chalk and Board/ Smart Board
44	21.05.24	2 <sup>nd</sup>	Liquefaction of Helium and its properties	21.05.24	2 <sup>nd</sup>	R2	Chalk and Board/ Smart Board
45	22.05.24	3 <sup>rd</sup>	Platinum Resistance Thermometer	22.05.24	3 <sup>rd</sup>	R2	Chalk and Board/ Smart Board
46	23.05.24	2 <sup>nd</sup>	Applications of Cryogenics, in Aerospace, Tribology and Food processing	23.05.24	2 <sup>nd</sup>	R2	Chalk and Board/ Smart Board
47	24.05.24	6 <sup>th</sup>	Numerical Problems in module-4	24.05.24	6 <sup>th</sup>	R2	Chalk and Board/ Smart Board
48	27.05.24	1 <sup>st</sup>	Numerical Problems in module-4	27.05.24	1 <sup>st</sup>	R2	Chalk and Board/ Smart Board
49	28.05.24	2 <sup>nd</sup>	<b>Module-5</b> <b>Material Characterization and Instrumentation Techniques:</b> Introduction to Nanomaterial and Nano-composites	28.05.24	2 <sup>nd</sup>	T3	Chalk and Board/ Smart Board
50	29.05.24	3 <sup>rd</sup>	Principle, construction and working of X-ray Diffractometer, Crystallite size determination by Scherrer equation	29.05.24	3 <sup>rd</sup>	T3	Chalk and Board/ Smart Board
51	30.05.24	2 <sup>nd</sup>	Atomic Force Microscopy (AFM): Principle, construction, working and applications	30.05.24	2 <sup>nd</sup>	T3	Chalk and Board/ Smart Board
52	31.05.24	6 <sup>th</sup>	Principle, construction, working and applications: X-ray Photoelectron Spectroscopy	31.05.24	6 <sup>th</sup>	T3	Chalk and Board/ Smart Board
53	04.06.24	1 <sup>st</sup>	Principle, construction, working and applications: Scanning Electron Microscopy	04.06.24	1 <sup>st</sup>	T3	Chalk and Board/ Smart Board/Video
54	05.06.24	2 <sup>nd</sup>	Principle, construction, working	05.06.24	2 <sup>nd</sup>	T3	Chalk and



			and applications: Transmission Electron Microscopy				Board/ Smart Board/Video
55	06.06.24	3 <sup>rd</sup>	Numerical Problems in module-5	06.06.24	3 <sup>rd</sup>	T3	Chalk and Board/ Smart Board/Video
56	07.06.24	2 <sup>nd</sup>	Numerical Problems in module-5	07.06.24	2 <sup>nd</sup>	T3	Chalk and Board/ Smart Board
57	08.06.24	6 <sup>th</sup>	Revision for VTU exam	08.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board
58	10.06.24	1 <sup>st</sup>	Important questions for Test	10.06.24	1 <sup>st</sup>		Chalk and Board/ Smart Board
59	11.06.24	2 <sup>nd</sup>	Previous year Question paper discussion	11.06.24	2 <sup>nd</sup>		Chalk and Board/ Smart Board
60	12.06.24	3 <sup>rd</sup>	Previous year Question paper discussion	12.06.24	3 <sup>rd</sup>		Chalk and Board/ Smart Board
61	13.06.24	2 <sup>nd</sup>	Previous year Question paper discussion	13.06.24	2 <sup>nd</sup>		Chalk and Board/ Smart Board
62	18.06.24	6 <sup>th</sup>	Previous year Question paper discussion	18.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board
63	19.06.24	3 <sup>rd</sup>	Revision for VTU exam	19.06.24	3 <sup>rd</sup>		Chalk and Board/ Smart Board
64	20.06.24	2 <sup>nd</sup>	Revision for VTU exam	20.06.24	2 <sup>nd</sup>		Chalk and Board/ Smart Board
65	21.06.24	6 <sup>th</sup>	Revision for VTU exam	21.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board
66	28.06.24	6 <sup>th</sup>	Revision for VTU exam	28.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board
67	29.06.24	2 <sup>nd</sup>	Revision for VTU exam	29.06.24	2 <sup>nd</sup>		Chalk and Board/ Smart Board

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i. Assignment: (Individual)
- ii. Seminars : (In Groups)

Sl. No.	CCE Component		Submission due Date
1	Assignment-1		26.04.2024
2	Assignment-2		21.06.2024
3	Seminars : In Groups		
	1.	Group-1	27.05.2024
	2.	Group-2	28.05.2024
	3.	Group-3	29.05.2024
	4.	Group-4	30.05.2024
	5.	Group-5	31.05.2024
	6.	Group-6	04.06.2024
	7.	Group-7	05.06.2024
8.	Group-8	06.06.2024	

1<sup>ST</sup> INTERNAL - 29/04/2024 - 03/05/2024,

2<sup>ND</sup> INTERNAL - 24/06/2024 - 27/06/2024

Book Type	Code	Title & Author	Publication Information		
			Edition	Publisher	Year
Text Books	T1	Vibrations and Waves	MIT Introductory Physics Series	A P French, CBS	2003
	T2	Theory of Elasticity	2nd Edition	McGraw Hill Book Co	2001
	T3	Materials Characterization Techniques	First Edition	CRC Press	2008
Reference Books	R1	Engineering Physics	7th Edition	Dhanpat Rai	2017
	R2	Mechanical Properties of Engineered Materials	1 <sup>st</sup> Edition	CRC Press	2002
	R3	Heat and Thermodynamics	1 <sup>st</sup> Edition	S. Chand & Company Ltd	1991
	R4	A text book of Engineering Physics	1 <sup>st</sup> Edition	S.Chand and Company Ltd	2017

Faculty

HOD

**CHILDREN'S EDUCATION SOCIETY (REGD.)**Administrative Office: 1<sup>st</sup> Phase JP Nagar, Bengaluru - 560 078

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**THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551, E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)**DEPARTMENT OF SCIENCE AND HUMANITIES****LESSON PLAN - ACADEMIC YEAR 2023-2024 (EVEN)****Date: 28.03.2024****FACULTY: Dr. P. Soundhirarajan****SEM: II****SUB: Applied Physics for CSEE Stream****BRANCH: BT****SECTION: P4****SUB.CODE: BPHYS202****Course Objectives:** The course will enable the students to,**CLO1:** To study the principles of quantum mechanics.**CLO2:** To understand the properties of dielectrics and superconductors**CLO3:** To study the essentials of photonics for engineering applications.**CLO4:** To understand fundamentals of vector calculus and EM waves.**CLO5:** To study the knowledge about semiconductors and devices.

COs	BPHYE202
CO1	Describe the principles of LASERS and Optical fibers and their relevant applications.
CO2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.
CO3	Summarize the essential properties of superconductors and applications in Quantum Computing
CO4	Illustrate the application of physics in design and data analysis
CO5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Sl. No.	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	11.03.2024	4 <sup>th</sup>	Introduction of syllabus	12.03.24	4 <sup>th</sup>	T1	Chalk and Board/ Smart Board
2	11.03.2024	7 <sup>th</sup>	<b>Module1</b> <b>Lasers:</b> Characteristic properties of LASER beam	12.03.24	7 <sup>th</sup>	T1	Chalk and Board/ Smart Board
3	13.03.2024	3 <sup>rd</sup>	Interaction of radiation with	14.03.24	3 <sup>rd</sup>	T1	Chalk and Board/ Smart

	4		matter, Absorption, spontaneous and stimulated emission				Board
4	14.03.2024	5 <sup>th</sup>	Einstein's coefficients expression for energy density	14.03.24	5 <sup>th</sup>	T1	Chalk and Board/ Smart Board
5	15.03.2024	5 <sup>th</sup>	Requisites of a Laser system. Conditions for Laser action.	15.03.24	5 <sup>th</sup>	T1	Chalk and Board/ Smart Board
6	18.03.2024	4 <sup>th</sup>	Principle, Construction and working of semiconductor Lasers.	19.03.24	4 <sup>th</sup>	T1	Chalk and Board/ Smart Board
7	20.03.2024	7 <sup>th</sup>	Applications: Bar code scanner, Numerical Problems	19.03.24	7 <sup>th</sup>	T1	Chalk and Board/ Smart Board
8	21.03.2024	3 <sup>rd</sup>	Applications: Laser Printer, Numerical Problems	21.03.24	3 <sup>rd</sup>	T1	Chalk and Board/ Smart Board
9	22.03.2024	5 <sup>th</sup>	<b>Optical Fibers:</b> Principle and Structure, Propagation	21.03.24	5 <sup>th</sup>	T1	Chalk and Board/ Smart Board
10	23.03.2024	5 <sup>th</sup>	Acceptance angle and Numerical Derivation of Expression for NA	22.03.24	5 <sup>th</sup>	T1	Chalk and Board/ Smart Board
11	23.03.2024	4 <sup>th</sup>	Modes of Propagation, RI Profile, Optical Fibers	26.03.24	4 <sup>th</sup>	T1	Chalk and Board/ Smart Board
12	25.03.2024	7 <sup>th</sup>	Attenuation and Fiber Losses, Applications, Optic networking	26.03.24	7 <sup>th</sup>	T1	Chalk and Board/ Smart Board
13	25.03.2024	3 <sup>rd</sup>	Fiber Optic Communication. Numerical Problems	28.03.24	3 <sup>rd</sup>	R1	Chalk and Board/ Smart Board
14	27.03.2024	5 <sup>th</sup>	<b><u>Module 2</u></b> <b>Modern Physics &amp; Quantum:</b> Wave-Particle dualism, de-Broglie hypothesis, de-Broglie wavelength.	28.03.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
15	28.03.2024	5 <sup>th</sup>	Phase Velocity and Group Velocity	29.03.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
16	01.04.2024	4 <sup>th</sup>	Heisenberg's uncertainty principle and its physical significance, Application of uncertainty principle-Non-existence of	30.03.24	4 <sup>th</sup>	R1	Chalk and Board/ Smart Board

			electron in the nucleus				
17	01.04.2024	7 <sup>th</sup>	Principle of Complementarity, Wave Function, Numerical Problem	30.03.24	7 <sup>th</sup>	R1	Chalk and Board/ Smart Board
18	03.04.2024	4 <sup>th</sup>	Time independent Schrödinger wave equation. Physical Significance of a wave function and Born Interpretation	02.04.24	4 <sup>th</sup>	R1	Chalk and Board/ Smart Board
19	04.04.2024	7 <sup>th</sup>	Eigenfunctions and Eigen Values, Particle inside one dimensional infinite potential well	02.04.24	7 <sup>th</sup>	R1	Chalk and Board/ Smart Board
20	04.04.24	3 <sup>rd</sup>	Quantization of Energy States, Waveforms and Probabilities.	04.04.24	3 <sup>rd</sup>	R1	Chalk and Board/ Smart Board
21	04.04.24	5 <sup>th</sup>	Numerical Problems.	05.04.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
22	05.04.24	5 <sup>th</sup>	<b>Module 4</b> <b>Electrical Properties of Materials and Applications:</b> Resistivity and Mobility, Concept of Phonon, Matthiessen's rule,	05.04.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
23	09.04.24	4 <sup>th</sup>	Failures of Classical Free Electron Theory, Assumptions of Quantum Free Electron Theory	09.04.24	4 <sup>th</sup>	R1	Chalk and Board/ Smart Board
25	09.04.24	7 <sup>th</sup>	Fermi Energy, Density of States, Fermi Factor	09.04.24	7 <sup>th</sup>	R1	Chalk and Board/ Smart Board
24	11.04.24	3 <sup>rd</sup>	Variation of Fermi Factor With Temperature and Energy.	11.04.24	3 <sup>rd</sup>	R1	Chalk and Board/ Smart Board
25	11.04.24	5 <sup>th</sup>	Numerical Problems.	11.04.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
26	16.04.24	4 <sup>th</sup>	<b>Superconductivity:</b> Introduction to Superconductors, Temperature dependence of resistivity,	16.04.24	4 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
27	16.04.24	7 <sup>th</sup>	Meissner's Effect, Critical Field	16.04.24	7 <sup>th</sup>	R3, R4	Chalk and

							Board/ Smart Board
28	18.04.24	3 <sup>rd</sup>	Temperature dependence of Critical field, Types of Superconductors,	18.04.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
29	18.04.24	5 <sup>th</sup>	BCS theory, Quantum Tunnelling, High Temperature superconductivity,	18.04.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
30	19.04.24	5 <sup>th</sup>	Josephson Junctions, DC and RF SQUIDS	19.04.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
31	23.04.24	4 <sup>th</sup>	Applications in Quantum Computing	23.04.24	4 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
32	23.04.24	7 <sup>th</sup>	Charge, Phase and Flux qubits	23.04.24	7 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
33	25.04.24	3 <sup>rd</sup>	Numerical Problems.	25.04.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
			<b><u>Module 3</u></b>				Chalk and Board/ Smart Board
34	25.04.24	5 <sup>th</sup>	<b>Quantum Computing:</b> Introduction to Quantum Computing, Moore's law & its end	25.04.24	5 <sup>th</sup>	R3, R4	
35	26.04.24	5 <sup>th</sup>	Differences between Classical & Quantum computing. Concept of qubit and its properties	08.05.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
36	27.04.24	3 <sup>rd</sup>	Representation of qubit by Bloch sphere, Single and Two qubits. Extension to N qubits.	27.04.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
37	27.04.24	5 <sup>th</sup>	Matrix representation of 0 and 1 states, Identity Operator I, Applying I to $ 0\rangle$ and $ 1\rangle$ states	27.04.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
38	07.05.24	4 <sup>th</sup>	Pauli Matrices and its operations on $ 0\rangle$ and $ 1\rangle$ states, Explanation of i) Conjugate of a matrix	07.05.24	4 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
39	07.05.24	7 <sup>th</sup>	ii) Transpose of a matrix. Unitary matrix U,	07.05.24	7 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
40	09.05.24	3 <sup>rd</sup>	Examples: Row and Column Matrices and their multiplication, Probability, and Quantum Superpos	09.05.24	3 <sup>rd</sup>	T3	Chalk and Board/ Smart Board



			ition,normalizationrule.				
40	09.05.24	5 <sup>th</sup>	Orthogonality,Orthonormality. NumericalProblems	09.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
41	10.05.24	5 <sup>th</sup>	<b>Single Qubit Gates:</b> Quantum Not Gate, Pauli – X, Y and Z Gates,	10.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
42	11.05.24	5 <sup>th</sup>	Hadamard Gate, Phase Gate (or S Gate), T Gate <b>MultipleQubitGates:</b> Controlledgate,CNOTGate	11.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
43	14.05.24	4 <sup>th</sup>	RepresentationofSwapgate, Controlled-Z gate,Toffoligate. NumericalProblems	14.05.24	4 <sup>th</sup>	T3	Chalk and Board/ Smart Board
44	14.05.24	7 <sup>th</sup>	<b><u>Module:5</u></b> <b>ApplicationsofPhysicsincomputing:</b> Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale	14.05.24	7 <sup>th</sup>	T3	Chalk and Board/ Smart Board
45	16.05.24	3 <sup>rd</sup>	Weight and Strength,Motion and Timing in Animations, Constant Force and Acceleration,	16.05.24	3 <sup>rd</sup>	T3	Chalk and Board/ Smart Board
45	16.05.24	5 <sup>th</sup>	The Odd rule, Odd-rule Scenarios,	16.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
45	17.05.24	5 <sup>th</sup>	MotionGraphs, Examples of Character Animation: Jumping, Parts of Jump, Jump Magnification, Stop Time,	17.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
45	21.05.24	4 <sup>th</sup>	Walking: Stridesand Steps, WalkTiming. Numerical Problems	21.05.24	4 <sup>th</sup>	T3	Chalk and Board/ Smart Board
47	21.05.24	7 <sup>th</sup>	<b>Statistical Physics for Computing:</b> Descriptive statistics and inferential statistics, Poisson distribution	21.05.24	7 <sup>th</sup>	T3	Chalk and Board/ Smart Board

48	23.05.24	3 <sup>rd</sup>	modelingtheprobabilityofprotondecay, NormalDistributions,	23.05.24	3 <sup>rd</sup>		Chalk and Board/ Smart Board
49	23.05.24	5 <sup>th</sup>	MonteCarloMethod, DeterminationofValueof $\pi$ .	23.05.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board
50	24.05.24	5 <sup>th</sup>	Numerical Problems.	24.05.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board
51	28.05.24	4 <sup>th</sup>	Numerical Problems in module-5	30.05.24	4 <sup>th</sup>	R2	Chalk and Board/ Smart Board
52	28.05.24	7 <sup>th</sup>	Numerical Problems in module-5	31.05.24	7 <sup>th</sup>	R2	Chalk and Board/ Smart Board
53	30.05.24	3 <sup>rd</sup>	Revision for VTU exam	30.05.24	3 <sup>rd</sup>	R2	Chalk and Board/ Smart Board/Video
54	30.05.24	5 <sup>th</sup>	Important questions for Test	30.05.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board/Video
54	31.05.24	5 <sup>th</sup>	Previous year Question paper discussion	31.05.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board/Video
54	04.06.24	4 <sup>th</sup>	Previous year Question paper discussion	04.06.24	4 <sup>th</sup>	R2	Chalk and Board/ Smart Board/Video
54	04.06.24	7 <sup>th</sup>	Previous year Question paper discussion	04.06.24	7 <sup>th</sup>	R2	Chalk and Board/ Smart Board/Video
55	06.06.24	3 <sup>rd</sup>	Previous year Question paper discussion	06.06.24	3 <sup>rd</sup>	R2	Chalk and Board/ Smart Board/Video
56	06.06.24	5 <sup>th</sup>	Revision for VTU exam	06.06.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board
57	07.06.24	5 <sup>th</sup>	Revision for VTU exam	07.06.24	5 <sup>th</sup>		Chalk and Board/ Smart Board
58	08.06.24	4 <sup>th</sup>	Important questions for Test	08.06.24	4 <sup>th</sup>		Chalk and Board/ Smart Board
59	08.06.24	7 <sup>th</sup>	Previous year Question paper discussion	08.06.24	7 <sup>th</sup>		Chalk and Board/ Smart Board
60	11.06.24	3 <sup>rd</sup>	Previous year Question paper discussion	11.06.24	3 <sup>rd</sup>		Chalk and Board/ Smart Board
61	11.06.24	5 <sup>th</sup>	Previous year Question paper discussion	11.06.24	5 <sup>th</sup>		Chalk and Board/ Smart Board
62	13.06.24	6 <sup>th</sup>	Previous year Question paper discussion	13.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board

63	14.06.24	3 <sup>rd</sup>	Revision for VTU exam	14.06.24	3 <sup>rd</sup>		Chalk and Board/ Smart Board
64	18.06.24	2 <sup>nd</sup>	Revision for VTU exam	18.06.24	2 <sup>nd</sup>		Chalk and Board/ Smart Board
65	18.06.24	6 <sup>th</sup>	Revision for VTU exam	18.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board
66	20.06.24	6 <sup>th</sup>	Revision for VTU exam	20.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board
67	20.06.24	2 <sup>nd</sup>	Revision for VTU exam	20.06.24	2 <sup>nd</sup>		Chalk and Board/ Smart Board

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i. Assignment: (Individual)
- ii. Seminars : (In Groups)

Sl. No.	CCE Component		Submission due Date
1	Assignment-1		26.04.2024
2	Assignment-2		21.06.2024
3	Seminars :In Groups		
	1.	Group-1	27.05.2024
	2.	Group-2	28.05.2024
	3.	Group-3	04.06.2024
	4.	Group-4	11.06.2024
	5.	Group-5	07.06.2024
	6.	Group-6	08.06.2024
	7.	Group-7	11.06.2024
	8.	Group-8	14.06.2024

1<sup>ST</sup> INTERNAL - 29/04/2024 - 03/05/2024, 2<sup>ND</sup> INTERNAL - 24/06/2024 - 27/06/2024

Book Type	Code	Title & Author	Publication Information		
			Edition	Publisher	Year
Text Books	T1	A text book of Engineering Physics	10th Revised Edition	S. Chand. & Company Ltd	2011

	<b>T2</b>	An Introduction to Lasers theory and applications	Revised Edition	M. N. Avadhanulu and P.S. Hemne	2012
	<b>T3</b>	Introduction to Electrodynamics	4th Edition	Cambridge University Press	2017
<b>Reference Books</b>	<b>R1</b>	Engineering Physics	7th Edition	DhanpatRai	2017
	<b>R2</b>	Fundamentals of Fibre Optics in Telecommunication & Sensor Systems	4th Edition	New Age International Publishers	2012
	<b>R3</b>	Solid State Physics-S O Pillai	8th Edition	New Age International Publishers	2018
	<b>R4</b>	A text book of Engineering Physics	1 <sup>st</sup> Edition	S.Chand and Company Ltd	2017

**Faculty**

**HOD**



## CHILDREN'S EDUCATION SOCIETY (REGD.)

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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## THE OXFORD COLLEGE OF ENGINEERING

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### Department of S & H LESSON PLAN

**Faculty Name: Lavanya.B.S**

**Academic Year: 2023-24**

**SUB.CODE & Name: BMATS101 & MATHEMATICS -1 FOR CSE**

**Year/Sem/Section: 1/1/P1**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Familiarize the importance of calculus associated with one variable and multivariable for computer science and engineering.

CLO2. • Analyze Computer science and engineering problems by applying Ordinary Differential Equations.

CLO3. Apply the knowledge of modular arithmetic to computer algorithms.

CLO4. Develop the knowledge of Linear Algebra to solve the system of equations.

### **COURSE OUTCOMES:**

<b>CO1</b>	Apply the knowledge of calculus to solve problems related to polar curves.
<b>CO2</b>	Learn the notion of partial differentiation to compute rate of change of multivariate functions.
<b>CO3</b>	Get acquainted and to apply modular arithmetic to computer algorithms
<b>CO4</b>	Make use of matrix theory for solving the system of linear equations and compute eigenvalues and Eigenvectors.
<b>CO5</b>	Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB.

SL.N O	Planned	TOPICS TO BE COVERED	Execution	Text /Reference	Pedagogy (as per the
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	Date	Hr		Date	Hr		
1.	14/09/23	1	Polar coordinates,	14/09/23	1	T1,R1	Talk / Smart Board
2.	19/09/23	3	Polar curves,	19/09/23	3	T1,R1	Talk / Smart Board
3.	20/09/23	4	Angle between the radius vector and the tangent,	20/09/23	4	T1,R1	Talk / Smart Board
4.	21/09/23	5	Angle between two curves	21/09/23	5	T1,R1	Talk / Smart Board
5.	25/09/23	3	Pedal equations.	25/09/23	3	T1,R1	Talk / Smart Board
6.	26& 27/09/23	1	Curvature and Radius of curvature	26& 27/09/23	1	T1,R1	Talk / Smart Board
7.	3&4/10/22	3	Cartesian, Parametric,	3&4/10/22	3	T1,R1	Talk / Smart Board
8.	05&9/10/22	4	Polar and forms. Problems	05&9/10/22	4	T1,R1	Talk / Smart Board
9.	10/10/22	5	Taylor's series expansion for one variable (Statement only) – problems.	10/10/22	5	T1,R1	Talk / Smart Board
10.	11/10/22	3	Maclaurin's series expansion for one variable (Statement only) – problems.	11/10/22	3	T1,R1	Talk / Smart Board
11.	12/10/23	1	Indeterminate forms – L Hospital's rule- Problems.	12/10/23	1	T1,R1	Talk / Smart Board
12.	16/10/23	3	Partial differentiation, total derivative -	16/10/23	3	T1,R1	Talk / Smart Board
13.	17/10/23	4	Differentiation of composite functions	17/10/23	4	T1,R1	Talk / Smart Board
14.	18/10/23	5	Jacobians and problems.	18/10/23	5	T1,R1	Talk / Smart Board
15.	19& 25/10/23	1	Maxima and minima for a function of two variables. Problems	19& 25/10/23	1	T1,R1	Talk / Smart Board
16.	26/10/23	3	Linear and Bernoulli's differential equations.	26/10/23	3	T1,R1	Talk / Smart Board
17.	30/10/23	4	Exact and reducible to exact differential equations -	30/10/23	4	T1,R1	Talk / Smart Board
18.	31/10/23	5	Integrating factors on 1 $N ( - \partial N \partial x)$ and 1 $M ( - \partial M \partial y)$ .	31/10/23	5	T1,R1	Talk / Smart Board
19.	02/11/23	3	Orthogonal trajectories, L-R & C-R circuits. Problems.	02/11/23	3	T1,R1	Talk / Smart Board
20.	13/11/23	1	Non-linear differential equations	13/11/23	1	T1,R1	Talk / Smart Board



21.	15/11/23	4	Introduction to general and singular solutions,	15/11/23	4	T1,R1	Talk / Smart Board
22.	16/11/23	3	Solvable for p only	16/11/23	3	T1,R1	Talk / Smart Board
23.	20&21/11/23	1	Clairaut's equations	20&21/11/23	1	T1,R1	Talk / Smart Board
24.	22/11/23	3	Introduction to Congruence's, Linear Congruence's,	22/11/23	3	T1,R1	Talk / Smart Board
25.	23/11/23	4	The Remainder theorem, Solving Polynomials	23/11/23	4	T1,R1	Talk / Smart Board
26.	27/11/23	5	Linear Diophantine Equation.	27/11/23	5	T2,R1	Talk / Smart Board
27.	28/11/23	3	System of Linear Congruence's,	28/11/23	3	T2,R1	Talk / Smart Board
28.	29/11/23	1	Euler's Theorem,	29/11/23	1	T2,R1	Talk / Smart Board
29.	4/12/24	3	Wilson Theorem	4/12/24	3	T2,R1	Talk / Smart Board
30.	5& 6/12/24	4	Fermat's little theorem. Applications of Congruence's-RSA algorithm	5& 6/12/24	4	T2,R1	Talk / Smart Board
31.	7&11/12/24	5	Revision	7&11/12/24	5	T2,R1	Talk / Smart Board
32.	12&13/12/24	3	Elementary row transformation of a matrix, Rank of a matrix.	12&13/12/24	3	T2,R1	Talk / Smart Board
33.	14 & 8/12/24	1	Consistency and Solution of system of linear equations - Gauss-elimination method.	14 & 18/12/24	1	T2,R1	Talk / Smart Board
34.	19/12/24	3	Gauss-Jordan method and	19/12/24	3	T2,R1	Talk / Smart Board
35.	20/12/24	4	Approximate solution by Gauss-Seidel method	20/12/24	4	T2,R1	Talk / Smart Board
36.	21/12/24	5	Eigenvalues and Eigenvectors,	21/12/24	5	T2,R1	Talk / Smart Board
37.	26/12/24	1	Rayleigh's power method to find the dominant Eigenvalues and Eigenvector	26/12/24	1	T2,R1	Talk / Smart Board
38.	8/9/23	3	<b>Suggested software: Mathematica/MATLAB /Python/Scila</b> Basics of Programming – Installation, operations & NumPy	8/9/23	3	T2,R1	Talk / Smart Board

39.	15/9/23, 22/9/23	4	2D plots for Cartesian and polar curves	15/9/23, 22/9/23	4	T2,R1	Talk / Smart Board
40.	06/10/23, 13/10/23	5	2 Finding angle between polar curves, curvature and radius of curvature of a given curve	06/10/23, 13/10/23	5	T2,R1	Talk / Smart Board
41.	20/10/23	3	3 Finding partial derivatives and Jacobian	20/10/23	3	T1,R1	Talk / Smart Board
42.	27/10/23	1	4 Applications to Maxima and Minima of two variables	27/10/23	1	T1,R1	Talk / Smart Board
43.	3/11/23	3	5 Solution of first-order ordinary differential equation and plotting the solution curves	3/11/23	3	T1,R1	Talk / Smart Board
44.	10/11/23	4	6 Solutions of Second order ordinary differential equations with initial/boundary conditions	10/11/23	4	T1,R1	Talk / Smart Board
45.	17/11/23	5	7 Solution of a differential equation of oscillations of a spring/deflection of a beam with different loads	17/11/23	5	T1,R1	Talk / Smart Board
46.	24/11/23	1	8 Numerical solutions of system of linear equations, test for consistency and graphical representation	24/11/23	1	T1,R1	Talk / Smart Board
47.	1/12/24	3	9 Solution of system of linear equations using Gauss-Seidel iteration	1/12/24	3	T1,R1	Talk / Smart Board
48.	8/12/24	4	10 Compute eigenvalues and eigenvectors and find the largest and smallest eigenvalues by Rayleigh power method.	8/12/24	4	T1,R1	Talk / Smart Board
49.	15/12/24,2 2/12/24	5	<b>Revision &amp; Practice - Lab</b>	15/12/24,22/12/24	5	T1,R1	Talk / Smart Board
50.	14/09/23	3	Polar coordinates,	14/09/23	3	T1,R1	Talk / Smart Board
51.	19/09/23	1	Polar curves,	19/09/23	1	T1,R1	Talk / Smart Board
52.	20/09/23	3	Angle between the radius vector and the tangent,	20/09/23	3	T1,R1	Talk / Smart Board

53.	21/09/23	4	Angle between two curves	21/09/23	4	T1,R1	Talk / Smart Board
54.	25/09/23	5	Pedal equations.	25/09/23	5	T2,R1	Talk / Smart Board
55.	26& 27/09/23	3	Curvature and Radius of curvature	26& 27/09/23	3	T2,R1	Talk / Smart Board
56.	3&4/10/22	1	Cartesian, Parametric,	3&4/10/22	1	T2,R1	Talk / Smart Board
57.	05&9/10/22	3	Polar and forms. Problems	05&9/10/22	3	T2,R1	Talk / Smart Board
58.	10/10/22	5	Taylor's series expansion for one variable (Statement only) – problems.	10/10/22	5	T2,R1	Talk / Smart Board
59.	11/10/22	4	Maclaurin's series expansion for one variable (Statement only) – problems.	11/10/22	4	T2,R1	Talk / Smart Board
60.	12/10/23	3	Indeterminate forms – L Hospital's rule- Problems.	12/10/23	3	T2,R1	Talk / Smart Board
61.	16/10/23	3	Partial differentiation, total derivative -	16/10/23	3	T2,R1	Talk / Smart Board
62.	17/10/23	4	Differentiation of composite functions	17/10/23	4		Talk / Smart Board
63.	18/10/23	5	Jacobians and problems.	18/10/23	5		Talk / Smart Board
64.	19& 25/10/23	3	Maxima and minima for a function of two variables. Problems	19& 25/10/23	3		Talk / Smart Board

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	31/10/23
2	SEMINAR	22/12/23

**Textbooks:**

1. B. S. Grewal: "Higher Engineering Mathematics", Khanna publishers, 44th Ed. 2021.
2. E. Kreyszig: "Advanced Engineering Mathematics", John Wiley & Sons, 10th Ed. (Reprint), 2018.
3. David M Burton: "Elementary Number Theory" McGraw Hill, 7th Ed., 2017.

**Reference Books:**

- R1. V. Ramana: "Higher Engineering Mathematics" McGraw-Hill Education, 11th Ed., 2017
- R2. Srimanta Pal & Subodh C. Bhunia: "Engineering Mathematics" Oxford University Press, 3rd Ed., 2016.
- R3. N.P Bali and Manish Goyal: "A Textbook of Engineering Mathematics" Laxmi Publications, 10th Ed., 2022.
- R4. C. Ray Wylie, Louis C. Barrett: "Advanced Engineering Mathematics" McGraw – Hill Book Co., New York, 6th Ed., 2017.
- R5. Gupta C.B, Sing S.R and Mukesh Kumar: "Engineering Mathematic for Semester I and II", McGraw Hill Education (India) Pvt. Ltd 2015.
- R6. H. K. Dass and Er. Rajnish Verma: "Higher Engineering Mathematics" S. Chand Publication, 3rd Ed., 2014.
- R7. James Stewart: "Calculus" Cengage Publications, 7th Ed., 2019.

- R8. David C Lay: "Linear Algebra and its Applications", Pearson Publishers, 4th Ed., 2018.
- R9. Gareth Williams: "Linear Algebra with Applications", Jones Bartlett Publishers Inc., 6th Ed., 2017.
- R10. Gilbert Strang: "Linear Algebra and its Applications", Cengage Publications, 4th Ed. 2022.
- R11. William Stallings: "Cryptography and Network Security" Pearson Prentice Hall, 6th Ed., 2013.
- R12. Kenneth H Rosen: "Discrete Mathematics and its Applications" McGraw-Hill, 8th Ed. 2019.
- R13. Ajay Kumar Chaudhuri: "Introduction to Number Theory" NCBA Publications, 2nd Ed., 2009.
- R14. Thomas Koshy: "Elementary Number Theory with Applications" Harcourt Academic Press, 2 Ed., 2008.

**Faculty**

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**CHILDREN'S EDUCATION SOCIETY (REGD.)**Administrative Office: 1<sup>st</sup> Phase JP Nagar, Bengaluru - 560 078

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551, E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)**DEPARTMENT OF SCIENCE AND HUMANITIES****LESSON PLAN - ACADEMIC YEAR 2023-2024 (EVEN)****Date: 28.03.2024****FACULTY: Dr. P. Soundhirarajan****SEM: II****SUB: Applied Physics for CSEE Stream****BRANCH: BT****SECTION: P4****SUB.CODE: BPHYS202****Course Objectives:** The course will enable the students to,**CLO1:** To study the principles of quantum mechanics.**CLO2:** To understand the properties of dielectrics and superconductors**CLO3:** To study the essentials of photonics for engineering applications.**CLO4:** To understand fundamentals of vector calculus and EM waves.**CLO5:** To study the knowledge about semiconductors and devices.

COs	<b>BPHYE202</b>
<b>CO1</b>	Describe the principles of LASERS and Optical fibers and their relevant applications.
<b>CO2</b>	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.
<b>CO3</b>	Summarize the essential properties of superconductors and applications in Quantum Computing
<b>CO4</b>	Illustrate the application of physics in design and data analysis
<b>CO5</b>	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Sl. No.	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	11.03.2024 4	4 <sup>th</sup>	Introduction of syllabus	12.03.24	4 <sup>th</sup>	T1	Chalk and Board/ Smart Board
2	11.03.2024 4	7 <sup>th</sup>	<b>Module1</b> <b>Lasers:</b> Characteristic properties of LASER beam	12.03.24	7 <sup>th</sup>	T1	Chalk and Board/ Smart Board
3	13.03.2024 3 <sup>rd</sup>	3 <sup>rd</sup>	Interaction of radiation with	14.03.24	3 <sup>rd</sup>	T1	Chalk and Board/ Smart



	4		matter, Absorption, spontaneous and stimulated emission				Board
4	14.03.2024	5 <sup>th</sup>	Einstein's coefficients expression for energy density	14.03.24	5 <sup>th</sup>	T1	Chalk and Board/ Smart Board
5	15.03.2024	5 <sup>th</sup>	Requisites of a Laser system. Conditions for Laser action.	15.03.24	5 <sup>th</sup>	T1	Chalk and Board/ Smart Board
6	18.03.2024	4 <sup>th</sup>	Principle, Construction and working of semiconductor Lasers.	19.03.24	4 <sup>th</sup>	T1	Chalk and Board/ Smart Board
7	20.03.2024	7 <sup>th</sup>	Applications: Bar code scanner, Numerical Problems	19.03.24	7 <sup>th</sup>	T1	Chalk and Board/ Smart Board
8	21.03.2024	3 <sup>rd</sup>	Applications: Laser Printer, Numerical Problems	21.03.24	3 <sup>rd</sup>	T1	Chalk and Board/ Smart Board
9	22.03.2024	5 <sup>th</sup>	<b>Optical Fibers:</b> Principle and Structure, Propagation	21.03.24	5 <sup>th</sup>	T1	Chalk and Board/ Smart Board
10	23.03.2024	5 <sup>th</sup>	Acceptance angle and Numerical Derivation of Expression for NA	22.03.24	5 <sup>th</sup>	T1	Chalk and Board/ Smart Board
11	23.03.2024	4 <sup>th</sup>	Modes of Propagation, RI Profile, Optical Fibers	26.03.24	4 <sup>th</sup>	T1	Chalk and Board/ Smart Board
12	25.03.2024	7 <sup>th</sup>	Attenuation and Fiber Losses, Applications, Optic networking	26.03.24	7 <sup>th</sup>	T1	Chalk and Board/ Smart Board
13	25.03.2024	3 <sup>rd</sup>	Fiber Optic Communication. Numerical Problems	28.03.24	3 <sup>rd</sup>	R1	Chalk and Board/ Smart Board
14	27.03.2024	5 <sup>th</sup>	<b>Module 2</b> <b>Modern Physics &amp; Quantum:</b> Wave-Particle dualism, de-Broglie hypothesis, de-Broglie wavelength.	28.03.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
15	28.03.2024	5 <sup>th</sup>	Phase Velocity and Group Velocity	29.03.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
16	01.04.2024	4 <sup>th</sup>	Heisenberg's uncertainty principle and its physical significance, Application of uncertainty principle-Non-existence of	30.03.24	4 <sup>th</sup>	R1	Chalk and Board/ Smart Board

			electron in the nucleus				
17	01.04.2024	7 <sup>th</sup>	Principle of Complementarity, Wave Function, Numerical Problem	30.03.24	7 <sup>th</sup>	R1	Chalk and Board/ Smart Board
18	03.04.2024	4 <sup>th</sup>	Time independent Schrödinger wave equation. Physical Significance of a wave function and Born Interpretation	02.04.24	4 <sup>th</sup>	R1	Chalk and Board/ Smart Board
19	04.04.2024	7 <sup>th</sup>	Eigen functions and Eigen Values, Particle inside one dimensional infinite potential well	02.04.24	7 <sup>th</sup>	R1	Chalk and Board/ Smart Board
20	04.04.24	3 <sup>rd</sup>	Quantization of Energy States, Waveforms and Probabilities.	04.04.24	3 <sup>rd</sup>	R1	Chalk and Board/ Smart Board
21	04.04.24	5 <sup>th</sup>	Numerical Problems.	05.04.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
22	05.04.24	5 <sup>th</sup>	<b><u>Module 4</u></b> <b>Electrical Properties of Materials and Applications :</b> Resistivity and Mobility, Concept of Phonon, Matheissen's rule,	05.04.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
23	09.04.24	4 <sup>th</sup>	Failures of Classical Free Electron Theory, Assumptions of Quantum Free Electron Theory	09.04.24	4 <sup>th</sup>	R1	Chalk and Board/ Smart Board
25	09.04.24	7 <sup>th</sup>	Fermi Energy, Density of States, Fermi Factor	09.04.24	7 <sup>th</sup>	R1	Chalk and Board/ Smart Board
24	11.04.24	3 <sup>rd</sup>	Variation of Fermi Factor With Temperature and Energy.	11.04.24	3 <sup>rd</sup>	R1	Chalk and Board/ Smart Board
25	11.04.24	5 <sup>th</sup>	Numerical Problems.	11.04.24	5 <sup>th</sup>	R1	Chalk and Board/ Smart Board
26	16.04.24	4 <sup>th</sup>	<b>Superconductivity:</b> Introduction to Super Conductors, Temperature dependence of resistivity,	16.04.24	4 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
27	16.04.24	7 <sup>th</sup>	Meissner's Effect, Critical Field	16.04.24	7 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board

28	18.04.24	3 <sup>rd</sup>	Temperature dependence of Critical field, Types of Super Conductors,	18.04.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
29	18.04.24	5 <sup>th</sup>	BCS theory, Quantum Tunnelling, High Temperature superconductivity,	18.04.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
30	19.04.24	5 <sup>th</sup>	Josephson Junctions, DC and RF SQUIDs	19.04.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
31	23.04.24	4 <sup>th</sup>	Applications in Quantum Computing	23.04.24	4 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
32	23.04.24	7 <sup>th</sup>	Charge, Phase and Flux qubits	23.04.24	7 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
33	25.04.24	3 <sup>rd</sup>	Numerical Problems.	25.04.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
34	25.04.24	5 <sup>th</sup>	<b><u>Module 3</u></b> <b>Quantum Computing:</b> Introduction to Quantum Computing, Moore's law & its end	25.04.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
35	26.04.24	5 <sup>th</sup>	Differences between Classical & Quantum computing. Concept of qubit and its properties	08.05.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
36	27.04.24	3 <sup>rd</sup>	Representation of qubit by Bloch sphere, Single and Two qubits. Extension to N qubits.	27.04.24	3 <sup>rd</sup>	R3, R4	Chalk and Board/ Smart Board
37	27.04.24	5 <sup>th</sup>	Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $ 0\rangle$ and $ 1\rangle$ states	27.04.24	5 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
38	07.05.24	4 <sup>th</sup>	Pauli Matrices and its operations on $ 0\rangle$ and $ 1\rangle$ states, Explanation of i) Conjugate of a matrix	07.05.24	4 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
39	07.05.24	7 <sup>th</sup>	ii) Transpose of a matrix. Unitary matrix U,	07.05.24	7 <sup>th</sup>	R3, R4	Chalk and Board/ Smart Board
40	09.05.24	3 <sup>rd</sup>	Examples: Row and Column Matrices and their multiplication, Probability, and Quantum Superposition, normalization rule.	09.05.24	3 <sup>rd</sup>	T3	Chalk and Board/ Smart Board

40	09.05.24	5 <sup>th</sup>	Orthogonality, Orthonormality. Numerical Problems	09.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
41	10.05.24	5 <sup>th</sup>	<b>Single Qubit Gates:</b> Quantum Not Gate, Pauli – X, Y and Z Gates,	10.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
42	11.05.24	5 <sup>th</sup>	Hadamard Gate, Phase Gate (or S Gate), T Gate <b>Multiple Qubit Gates:</b> Controlled gate, CNOT Gate	11.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
43	14.05.24	4 <sup>th</sup>	Representation of Swap gate, Controlled -Z gate, Toffoli gate. Numerical Problems	14.05.24	4 <sup>th</sup>	T3	Chalk and Board/ Smart Board
44	14.05.24	7 <sup>th</sup>	<b>Module:5</b> <b>Applications of Physics in computing:</b> Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale	14.05.24	7 <sup>th</sup>	T3	Chalk and Board/ Smart Board
45	16.05.24	3 <sup>rd</sup>	Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration,	16.05.24	3 <sup>rd</sup>	T3	Chalk and Board/ Smart Board
45	16.05.24	5 <sup>th</sup>	The Odd rule, Odd-rule Scenarios,	16.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
45	17.05.24	5 <sup>th</sup>	Motion Graphs, Examples of Character Animation: Jumping, Parts of Jump, Jump Magnification, Stop Time,	17.05.24	5 <sup>th</sup>	T3	Chalk and Board/ Smart Board
45	21.05.24	4 <sup>th</sup>	Walking: Strides and Steps, Walk Timing. Numerical Problems	21.05.24	4 <sup>th</sup>	T3	Chalk and Board/ Smart Board
47	21.05.24	7 <sup>th</sup>	<b>Statistical Physics for Computing:</b> Descriptive statistics and inferential statistics, Poisson distribution	21.05.24	7 <sup>th</sup>	T3	Chalk and Board/ Smart Board
48	23.05.24	3 <sup>rd</sup>	modeling the probability of	23.05.24	3 <sup>rd</sup>		Chalk and

			proton decay, Normal Distributions,				Board/ Smart Board
49	23.05.24	5 <sup>th</sup>	Monte Carlo Method, Determination of Value of $\pi$ .	23.05.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board
50	24.05.24	5 <sup>th</sup>	Numerical Problems.	24.05.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board
51	28.05.24	4 <sup>th</sup>	Numerical Problems in module-5	30.05.24	4 <sup>th</sup>	R2	Chalk and Board/ Smart Board
52	28.05.24	7 <sup>th</sup>	Numerical Problems in module-5	31.05.24	7 <sup>th</sup>	R2	Chalk and Board/ Smart Board
53	30.05.24	3 <sup>rd</sup>	Revision for VTU exam	30.05.24	3 <sup>rd</sup>	R2	Chalk and Board/ Smart Board/Video
54	30.05.24	5 <sup>th</sup>	Important questions for Test	30.05.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board/Video
54	31.05.24	5 <sup>th</sup>	Previous year Question paper discussion	31.05.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board/Video
54	04.06.24	4 <sup>th</sup>	Previous year Question paper discussion	04.06.24	4 <sup>th</sup>	R2	Chalk and Board/ Smart Board/Video
54	04.06.24	7 <sup>th</sup>	Previous year Question paper discussion	04.06.24	7 <sup>th</sup>	R2	Chalk and Board/ Smart Board/Video
55	06.06.24	3 <sup>rd</sup>	Previous year Question paper discussion	06.06.24	3 <sup>rd</sup>	R2	Chalk and Board/ Smart Board/Video
56	06.06.24	5 <sup>th</sup>	Revision for VTU exam	06.06.24	5 <sup>th</sup>	R2	Chalk and Board/ Smart Board
57	07.06.24	5 <sup>th</sup>	Revision for VTU exam	07.06.24	5 <sup>th</sup>		Chalk and Board/ Smart Board
58	08.06.24	4 <sup>th</sup>	Important questions for Test	08.06.24	4 <sup>th</sup>		Chalk and Board/ Smart Board
59	08.06.24	7 <sup>th</sup>	Previous year Question paper discussion	08.06.24	7 <sup>th</sup>		Chalk and Board/ Smart Board
60	11.06.24	3 <sup>rd</sup>	Previous year Question paper discussion	11.06.24	3 <sup>rd</sup>		Chalk and Board/ Smart Board
61	11.06.24	5 <sup>th</sup>	Previous year Question paper discussion	11.06.24	5 <sup>th</sup>		Chalk and Board/ Smart Board
62	13.06.24	6 <sup>th</sup>	Previous year Question paper discussion	13.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board

63	14.06.24	3 <sup>rd</sup>	Revision for VTU exam	14.06.24	3 <sup>rd</sup>		Chalk and Board/ Smart Board
64	18.06.24	2 <sup>nd</sup>	Revision for VTU exam	18.06.24	2 <sup>nd</sup>		Chalk and Board/ Smart Board
65	18.06.24	6 <sup>th</sup>	Revision for VTU exam	18.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board
66	20.06.24	6 <sup>th</sup>	Revision for VTU exam	20.06.24	6 <sup>th</sup>		Chalk and Board/ Smart Board
67	20.06.24	2 <sup>nd</sup>	Revision for VTU exam	20.06.24	2 <sup>nd</sup>		Chalk and Board/ Smart Board

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i. Assignment: (Individual)
- ii. Seminars : (In Groups)

Sl. No.	CCE Component		Submission due Date
1	Assignment-1		26.04.2024
2	Assignment-2		21.06.2024
3	Seminars : In Groups		
	1.	Group-1	27.05.2024
	2.	Group-2	28.05.2024
	3.	Group-3	04.06.2024
	4.	Group-4	11.06.2024
	5.	Group-5	07.06.2024
	6.	Group-6	08.06.2024
	7.	Group-7	11.06.2024
	8.	Group-8	14.06.2024



Book Type	Code	Title & Author	Publication Information		
			Edition	Publisher	Year
Text Books	T1	A text book of Engineering Physics	10th Revised Edition	S. Chand. & Company Ltd	2011
	T2	An Introduction to Lasers theory and applications	Revised Edition	M. N. Avadhanulu and P.S. Hemne	2012
	T3	Introduction to Electrodynamics	4th Edition	Cambridge University Press	2017
Reference Books	R1	Engineering Physics	7th Edition	Dhanpat Rai	2017
	R2	Fundamentals of Fibre Optics in Telecommunication & Sensor Systems	4th Edition	New Age International Publishers	2012
	R3	Solid State Physics-S O Pillai	8th Edition	New Age International Publishers	2018
	R4	A text book of Engineering Physics	1 <sup>st</sup> Edition	S.Chand and Company Ltd	2017

**Faculty**

**HOD**



## CHILDREN'S EDUCATION SOCIETY (Regd.)

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

**THE OXFORD COLLEGE OF ENGINEERING**

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Under Section 2(f))

Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551

E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF AIML

#### LESSON PLAN

**Faculty Name: SHWETHA P R**

**Academic Year: 2023- 2024- ODD SEM**

**SUB.CODE &Name: 21CS53/ DATA BASE MANAGEMENT SYSTEM**

**Year/Sem/Section: III/ V AIML**

**COURSE OBJECTIVES** This course will enable the students to

- CLO 1. Provide a strong foundation in database concepts, technology, and practice.
- CLO 2. Practice SQL programming through a variety of database problems.
- CLO 3. Demonstrate the use of concurrency and transactions in data base
- CLO 4. Design and build database applications for real world problems.

**COURSE OUTCOMES:** At the end of the course, the student will be able to:

CO1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS
CO2	Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
CO3	Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database.
CO4	Develop application to interact with databases, relational algebra expression.
CO5	Develop applications using tuple and domain relation expression from queries.

## LESSON PLAN

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	27/11/2023	1	Introduction to Databases: Introduction	27/11/2023	1	Textbook 1	Blackboard
2.	28/11/2023	5	Characteristics of database approach	28/11/2023	5	Textbook 1	Blackboard
3.	29/11/2023	6	Advantages of using the DBMS approach, History of database applications.	29/11/2023	6	Textbook 1	Blackboard
4.	4/12/2023	1	Overview of Database Languages and Architectures: Data Model	4/12/2023	1	Textbook 1	Blackboard
5.	5/12/2023	1	Schemas, and Instances. Three schema architecture and data independence	5/12/2023	1	Textbook 1	Blackboard
6.	6/12/2023	5	database languages, and interfaces, The Database System environment.	6/12/2023	5	Textbook 1	Blackboard
7.	7/12/2023	6	Conceptual Data Modelling using Entities and Relationships: Entity type	7/12/2023	6	Textbook 1	Blackboard
8.	11/12/2023	1	Entity sets, attributes, roles, and structural constraints	11/12/2023	1	Textbook 1	Blackboard
9.	12/12/2023	1	Weak entity types, ER diagrams, Examples	12/12/2023	1	Textbook 1	Blackboard
10	13/12/2023		Revision- module-1	13/12/2023	2	Textbook 1	Blackboard

<b>10.</b>	14/12/2023	5	Revision- module-1	14/12/2023	5	Textbook 1	Blackboard
<b>11.</b>	18/12/2023	6	Relational Model: Relational Model Concepts,	18/12/2023	6	Textbook 1	PPT
<b>12.</b>	19/12/2023	1	Relational Model Constraints and relational database schemas,	19/12/2023	1	Textbook 1	Blackboard
<b>13.</b>	20/12/2023	1	Update operations, transactions, and dealing with constraint violations.	20/12/2023	1	Textbook 1	PPT
<b>14.</b>	21/12/2023	5	Relational Algebra: Unary and Binary relational operations	21/12/2023	5	Textbook 1	PPT
<b>15.</b>	26/12/2023	6	additional relational operations (aggregate, grouping, etc.)	26/12/2023	6	Textbook 1	Blackboard
<b>16.</b>	27/12/2023	1	Examples of Queries in relational algebra.	27/12/2023	1	Textbook 1	PPT
<b>17.</b>	28/01/2024	1	Mapping Conceptual Design into a Logical Design: introduction	28/01/2024	1	Textbook 1	PPT
<b>18.</b>	1/01/2024	5	: Relational Database Design using ER-to-Relational mapping.	1/01/2024	5	Textbook 1	PPT
<b>19.</b>	2/01/2024	6	REVISION-MODULE-2	2/01/2024	6	Textbook 1	Blackboard
<b>20.</b>	3/01/2024	1	SQL: SQL data definition and data types,	3/01/2024	1	Textbook 1	PPT
<b>21.</b>	4/01/2024	1	specifying constraints in SQL, retrieval queries in SQL	4/01/2024	1	Textbook 1	PPT
<b>22.</b>	8/01/2024	5	INSERT, DELETE, and UPDATE statements in SQL, Additional features of SQL.	8/01/2024	5	Textbook 1	PPT
<b>23.</b>	9/01/2024	6	Advances Queries: More complex SQL retrieval queries	9/01/2024	6	Textbook 1	Blackboard
<b>24.</b>	10/01/2024	1	Specifying constraints as assertions and action triggers	10/01/2024	1	Textbook 1	PPT
<b>25</b>	11/01/2024	1	Views in SQL, Schema change statements in SQL. Database	11/01/2024	1	Textbook 1	PPT

<b>26.</b>	11/01/2024	5	Application Development: Accessing databases from applications,	11/01/2024	5	Textbook 1	PPT
<b>27.</b>	16/01/2024	6	An introduction to JDBC, JDBC classes and interfaces,	16/01/2024	6	Textbook 1	Blackboard
<b>28.</b>	17/01/2024	1	SQLJ, Stored procedures, Case study: The internet Bookshop.	17/01/2024	1	Textbook 1	Blackboard
<b>29.</b>	18/01/2024	1	Normalization: Database Design Theory – Introduction to Normalization using Functional and Multivalued Dependencies:	18/01/2024	1	Textbook 1	Blackboard
<b>30.</b>	22/01/2024	5	: Informal design guidelines for relation schema, Functional Dependencies	22/01/2024	5	Textbook 1	Blackboard
<b>31.</b>	23/01/2024	6	Normal Forms based on Primary Keys, Second and Third Normal Forms, Boyce- Codd Normal Form,	23/01/2024	6	Textbook 1	Blackboard
<b>32.</b>	24/01/2024	1	Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form. Examples on normal forms.	24/01/2024	1	Textbook 1	Blackboard
<b>33.</b>	25/01/2024	1	Normalization Algorithms: Inference Rules, Equivalence	25/01/2024	1	Textbook 1	Blackboard
<b>34.</b>	1/02/2024	5	Minimal Cover, Properties of Relational Decompositions, Algorithms for Relational Database Schema Design	1/02/2024	5	Textbook 1	Blackboard
<b>35.</b>	5/02/2024	6	Nulls, Dangling tuples, and alternate Relational Designs,	5/02/2024	6	Textbook 1	Blackboard
<b>36.</b>	6/02/2024	1	Further discussion of Multivalued dependencies and 4NF, Other dependencies and Normal Forms	6/02/2024	1	Textbook 1	Blackboard
<b>37.</b>	7/02/2024	1	Transaction Processing: Introduction to Transaction Processing	7/02/2024	1	Textbook 1	Blackboard
<b>38.</b>	8/02/2024	5	Transaction and System concepts, Desirable properties of Transactions	8/02/2024	5	Textbook 1	PPT
<b>39.</b>	12/02/2024	6	Characterizing schedules based on recoverability	12/02/2024	6	Textbook 1	PPT
<b>40.</b>	13/02/2024	2	Characterizing schedules based on Serializability, Transaction support in SQL.	13/02/2024	2	Textbook 1	PPT

<b>41.</b>	14/02/2024	3	Concurrency Control in Databases: Two-phase locking techniques for Concurrency control,	14/02/2024	3	Textbook 1	PPT
<b>42.</b>	15/02/2024	1	Concurrency control based on Timestamp ordering,	15/02/2024	1	Textbook 1	Blackboard
<b>43</b>	19/02/2024	2	Multi version Concurrency control techniques,	19/02/2024	2	Textbook 1	Blackboard
<b>44</b>	20/02/2024	3	Validation Concurrency control techniques,	20/02/2024	3	Textbook 1	Blackboard
<b>45</b>	21/02/2024	4	Granularity of Data items and Multiple Granularity Locking	21/02/2024	4	Textbook 1	Blackboard
<b>46</b>	22/02/2024	5	REVISION-MODULES-1,2,3,4,5	22/02/2024	5	Textbook 1	Blackboard
<b>47</b>	26/02/2024	1	PREVIOUS YEAR QUESTION PAPERS SOLVING	26/02/2024	1	Textbook 1	Blackboard
<b>48</b>	7/03/2024	2	REVISION WHOLE SYLLOBUS INCLUDING LABS	7/03/2024	2	Textbook 1	Blackboard



SL NO	NAME	DATES
1	CIE-1	1/12/2023-3/12/2023
2	CIE-2	5/1/2024-8/1/2024
3	CIE-2	1/2/2024-5/2/2024

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity


Sr. No.	CCE Component	Submission due Date
1		
2		

### Textbooks:

1. Nonconventional Energy Resources, Shobh Nath Singh, Pearson, 1st Edition, 2015.

### Reference Book;-

1. Nonconventional Energy Resources, B.H. Khan, McGraw Hill, 3rd Edition.
2. Renewable Energy; Power for a sustainable Future, Godfrey Boyle, Oxford, 3rd Edition, 2012.
3. Renewable Energy Sources: Their Impact on global Warming and Pollution, Tasneem Abbasi S.A. Abbasi, PHI, 1st Edition, 2011

  
 HEAD OF THE DEPARTMENT  
 DEPARTMENT OF AIML  
 THE OXFORD COLLEGE OF ENGINEERING  
 Bengaluru-560068





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Administrative Office:

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF BIOTECHNOLOGY**

**LESSON PLAN**

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: 21BT51/ BIOKINETICS & BIOREACTION**

**ENGINEERING Year/Sem/Section 3<sup>rd</sup> YEAR / 5th SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To discuss the different models of chemical reactions and how various factors such as temperature affect reaction rate.

CLO2. To study the performance and distinguish between the different types of ideal and non ideal reactors.

CLO3. To determine the optimum pH, temperature and concentration of an enzyme.

CLO4. To understand the aspects of substrate affinity and enzyme inhibition.

CLO4. To describe medium requirements and medium formulation for maximizing the yield

**COURSE OUTCOMES:**

<b>CO1</b>	Detail the mechanism and kinetics of chemical, enzyme and microbial reactions.
<b>CO2</b>	Identify and summarize the parameters from a range of reactions to optimize reactor design and development.
<b>CO3</b>	Demonstrate the use of various scientific parameters to improve the performance of fermentation process.
<b>CO4</b>	Formulate a suitable media for maximized microbial growth and product yields, by analysing various parameters

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Law of mass action and rate equation	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Definitions and examples of elementary and non elementary reactions	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	Design equations for homogeneous system - batch	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	stirred tank and tubular flow reactor, size comparison of single reactors, combination of reactor systems	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	Qualitative design for parallel and series reactors.	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	Batch growth kinetics	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	size comparison of single reactors,	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	combination of reactor systems	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Elemental balance of biological conversion with and without extracellular product formation,	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Degree of reduction	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	Theoretical prediction of yield coefficients	28/9/23	3	T1, R2	Smart board , ppt

12	29/9/23	1	Factors affecting microbial growth	29/9/23	1	T1, R2	Smart board , ppt	
13	29/9/23	2	Monod growth kinetics	29/9/23	2	T1, R2	Smart board , ppt	
14	29/9/23	1	Conceptual numericals.Case studies.	29/9/23	1	T1, R2	Smart board , ppt	
15	2/10/23	3	Checklists, Fishbone diagram, Control chart	2/10/23	3	T1, R2	Smart board , ppt	
16	2/10/23	1	Stratification	2/10/23	1	T1, R2	Smart board , ppt	
17	4/10/23	2	Pareto chart	4/10/23	2	T1, R2	Smart board , ppt	
18	5/10/23	1	Concept, meaning and importance in Biotechnology industry (products and services).	5/10/23	1	T1, R2	Smart board , ppt	
19	6/10/23	3	pharmaceuticals/drugs	6/10/23	3	T1, R2	Smart board , ppt	
20	9/10/23	1	biologics, medical devices,	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	foods, seeds and testing.	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	Role of regulatory bodies FDA,	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	DCGI	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	<b>CIE 1</b>						Harn
25	17/9/23							Harn
26	18/9/23							Impl
27	25/10/23	1	Medium requirements for fermentation processes	25/10/23	1	T1, R2	Smart board , ppt	
28	26/10/23	2	Carbon, nitrogen,	26/10/23	2	T1, R2	Smart board , ppt	
29	27/10/23	1	oxygen requirements	27/10/23	1	T1, R2	Smart board , ppt	
30	30/10/23	3	examples of simple and complex media thermal death kinetics of	30/10/23	3	T1, R2	Smart board , ppt	

			microorganisms				
31	2/11/23	1	Batch and continuous heat – Sterilization of Liquid media	2/11/23	1	T1, R2	Smart board , ppt
32	3/11/23	2	Filter sterilization of liquid media. Case studies.	3/11/23	2	T1, R2	Smart board , ppt
33	6/11/23	1	minerals	6/11/23	1	T1, R2	Smart board , ppt
34	8/11/23	3	vitamins and other complex nutrients	8/11/23	3	T1, R2	Smart board , ppt
35	9/11/23	1	pharmaceuticals/drugs	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Role of regulatory bodies FDA,	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	Pareto chart	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Concept, meaning and importance in Biotechnology industry (products and services).	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	pharmaceuticals/drugs	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	Role of regulatory bodies FDA,	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes



- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	12/9/2023
2	ASSIGNMENT	17/11/23

**Text Books:**

1. Biology for Engineers, Arthur T. Johnson, CRC Press, Taylor and Francis, 2011.

**Reference Book:**

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.



Faculty

(Dr. Nair Sreecha Chandran)



HOD

DR. B.K. MANJUNATHA  
 Professor & Head  
 Department of Biotechnology  
 The Oxford College of Engineering  
 Bengaluru-560 068.

IOAC



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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**THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF BIOTECHNOLOGY**

**LESSON PLAN**

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: 21BT52/ Conservation of Natural Resources**

**Year/Sem/Section 3<sup>rd</sup> YEAR / 6th SEM**

**COURSE OBJECTIVES** This course will enable the students to

**CLO1.** Learn types of land forms, soil conservation and sustainable land use planning.

**CLO2.** Apprehend water resources, types, distribution, planning and conservation. Water pollution and types Of uses.

**CLO3.** Know the types of minerals and rocks.

**CLO4.** Know the atmospheric composition of air, pollution and effects on human beings, animals and plants. Air pollution control.

**CLO5.** Apprehend basics of biodiversity and ecosystems.

**COURSE OUTCOMES:**

<b>CO1</b>	Apprehend various components of land as a natural resource and land use planning.
<b>CO2</b>	Know availability and demand for water resources as applied to India.
<b>CO3</b>	Analyse the components of air as resource and its pollution.
<b>CO4</b>	Discuss biodiversity & its role in ecosystem functioning.
<b>CO5</b>	Critically appreciate the environmental concerns of today.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Introduction	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Land as a resource, types of lands	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	conservation of land forms,	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	deforestation, effect of land use changes.	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	Soil health, ecological and economic importance of soil,	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	impact of soil degradation on agriculture and food security	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	needfor soil conservation, sustainable land use planning	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	Water: Global water resources, Indian water resources,	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Resources system planning. Water use sectors- domestic, industrial, agriculture.	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Water deficit and water surplus basins in India,	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	equitable distribution, Inter-basin water transfers, Interlinking of rivers – Himalayan component,	28/9/23	3	T1, R2	Smart board , ppt
12	29/9/23	1	peninsular component, issues involved. Ground water, its potential in India,	29/9/23	1	T1, R2	Smart board , ppt
13	29/9/23	2	conjunctive use, recharge of ground water.	29/9/23	2	T1, R2	Smart board , ppt

14	29/9/23	1	Contamination of ground water, sea water ingress, problems and solutions	29/9/23	1	T1, R2	Smart board , ppt	
15	2/10/23	3	Contamination of ground water, sea water ingress, problems and solutions	2/10/23	3	T1, R2	Smart board , ppt	
16	2/10/23	1	Air: Introduction,	2/10/23	1	T1, R2	Smart board , ppt	
17	4/10/23	2	composition, sources and classification of air	4/10/23	2	T1, R2	Smart board , ppt	
18	5/10/23	1	pollutants, National Ambient Air quality standards (NAAQS),	5/10/23	1	T1, R2	Smart board , ppt	
19	6/10/23	3	Air quality index, effects of air pollution on human health	6/10/23	3	T1, R2	Smart board , ppt	
20	9/10/23	1	biologics, medical devices,	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	foods, seeds and testing.	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	Role of regulatory bodies FDA,	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	DCGI	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	<b>CIE 1</b>						Harm
25	17/9/23							Harm
26	18/9/23							Impl
27	25/10/23	1	Threat to biodiversity,	25/10/23	1	T1, R2	Smart board , ppt	
28	26/10/23	2	natural & anthropogenic disturbance, habitat loss.	26/10/23	2	T1, R2	Smart board , ppt	
29	27/10/23	1	Conservation of biodiversity, National parks, wild life sanctuaries, zoological gardens, gene banks, pollen culture,	27/10/23	1	T1, R2	Smart board , ppt	
30	30/10/23	3	ecological restoration, social forestry.	30/10/23	3	T1, R2	Smart board , ppt	
31	2/11/23	1	Ecosystem: Definition, Types:	2/11/23	1	T1, R2	Smart	

			forest, grass land, marine, desert, wetlands, estuarine, lotic, lentic				board , ppt
32	3/11/23	2	Ecosystem: Definition, Types: forest, grass land, marine, desert, wetlands, estuarine, lotic, lentic.	3/11/23	2	T1, R2	Smart board , ppt
33	6/11/23	1	Abiotic & biotic components of ecosystem	6/11/23	1	T1, R2	Smart board , ppt
34	8/11/23	3	Global warming: concept,	8/11/23	3	T1, R2	Smart board , ppt
35	9/11/23	1	indicators, factor and effects	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Global climate change-indicators, health impacts,	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	effect on biodiversity	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Introduction to global efforts in conservation of biodiversity.	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	Threat to biodiversity,	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	natural & anthropogenic disturbance, habitat loss.	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

**Faculty can choose any two of the following:**

Sr. No.	CCE Component	Submission due Date
---------	---------------	---------------------



1	ASSIGNMENT	12/9/2023
2	ASSIGNMENT	17/11/23

**Text Books:**

1. Raghunath, H.M., "Groundwater" ,3rd Edition, New Age International Publishers, New Delhi, 2007.

**Reference Book:**

Odum, E.P., "Fundamentals of Ecology", W.B sounders, Philadelphia, USA, 1971



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**DEPARTMENT OF BIOTECHNOLOGY**

**LESSON PLAN**

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: 21BT62/ BIOPROCESS PRINCIPLES, CONTROL  
& AUTOMATION + LAB**

**Year/Sem/Section 3<sup>rd</sup> YEAR / 6th SEM**

**COURSE OBJECTIVES** This course will enable the students to  
**CLO1.** To Understand the basics of process dynamics, principles and instrumentation.  
**CLO2.** To Study various types of input functions and its response.  
**CLO3.** To Study the different types of controllers and their design stability aspects.

**COURSE OUTCOMES:**

<b>CO1</b>	Elaborate the basics of process principles, dynamics, and instrumentation.
<b>CO2</b>	Apply various types of input functions and study its response.
<b>CO3</b>	Perform studies on different types of controllers for their design and stability aspects

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Instrumentation-principles	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Introduction to flow,pressure,	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	temperature and liquid level measurements,	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	measurement of important physico-chemical and biochemical parameters, alprocesses.	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	methods of on-line and off-line biomass estimation	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	estimationtechniquesforbiochemic Flow injection analysis for measurement of substrates	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	Products and othe rmetabolites.	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	On-line data analysis for state and parameter	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Actuators, Positioners, Valve body, Valve plugs, Characteristics of final control elements (Transfer function for control valve),	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	controllers – twoposition control, proportional control, derivative control, integral control, P-I (proportional-integral)	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	control, P-D (proportional-derivative) control,P-I-D(proportional-integral-derivative)control,	28/9/23	3	T1, R2	Smart board , ppt

			and deduction,					
12	29/9/23	1	Block diagrams rules	29/9/23	1	T1, R2	Smart board , ppt	
13	29/9/23	2	servo and regulatory problems,conceptualnumericals.	29/9/23	2	T1, R2	Smart board , ppt	
14	29/9/23	1	Contamination of ground water, sea water ingress, problems and solutions	29/9/23	1	T1, R2	Smart board , ppt	
15	2/10/23	3	Contamination of ground water, sea water ingress, problems and solutions	2/10/23	3	T1, R2	Smart board , ppt	
16	2/10/23	1	Air: Introduction,	2/10/23	1	T1, R2	Smart board , ppt	
17	4/10/23	2	composition, sources and classification of air	4/10/23	2	T1, R2	Smart board , ppt	
18	5/10/23	1	pollutants, National Ambient Air quality standards (NAAQS),	5/10/23	1	T1, R2	Smart board , ppt	
19	6/10/23	3	Air quality index, effects of air pollution on human health	6/10/23	3	T1, R2	Smart board , ppt	
20	9/10/23	1	biologics, medical devices,	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	foods, seeds and testing.	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	Role of regulatory bodies FDA,	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	DCGI	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	<b>CIE 1</b>						Harm
25	17/9/23							Harm
26	18/9/23							Impl
27	25/10/23	1	Threat to biodiversity,	25/10/23	1	T1, R2	Smart board , ppt	
28	26/10/23	2	natural & anthropogenic disturbance, habitat loss.	26/10/23	2	T1, R2	Smart board , ppt	
29	27/10/23	1	Conservation of biodiversity, National parks, wild life sanctuaries, zoological gardens, gene banks, pollen	27/10/23	1	T1, R2	Smart board , ppt	

			culture,				
30	30/10/23	3	ecological restoration, social forestry.	30/10/23	3	T1, R2	Smart board , ppt
31	2/11/23	1	Ecosystem: Definition, Types: forest, grass land, marine, desert, wetlands, estuarine, lotic, lentic	2/11/23	1	T1, R2	Smart board , ppt
32	3/11/23	2	Ecosystem: Definition, Types: forest, grass land, marine, desert, wetlands, estuarine, lotic, lentic.	3/11/23	2	T1, R2	Smart board , ppt
33	6/11/23	1	Abiotic & biotic components of ecosystem	6/11/23	1	T1, R2	Smart board , ppt
34	8/11/23	3	Global warming: concept,	8/11/23	3	T1, R2	Smart board , ppt
35	9/11/23	1	indicators, factor and effects	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Global climate change-indicators, health impacts,	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	effect on biodiversity	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Introduction to global efforts in conservation of biodiversity.	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	Threat to biodiversity,	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	natural & anthropogenic disturbance, habitat loss.	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
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- xiv) Any other academic activity


<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	12/9/2023
2	ASSIGNMENT	17/11/23

**Text Books:**

1. Raghunath, H.M., “Groundwater” ,3rd Edition, New Age International Publishers, New Delhi, 2007.

**Reference Book:**

Odum, E.P., “Fundamentals of Ecology”, W.B sounders, Philadelphia, USA, 1971



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**DEPARTMENT OF BIOTECHNOLOGY**

**LESSON PLAN**

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: 21BT72/ BIOETHICS AND BIOSAFETY**

**Year/Sem/Section 4th YEAR / 7th SEM**

**COURSE OBJECTIVES** This course will enable the students to

**CLO1.** To introduce to the students about biosafety regulations.

**CLO2.** To understand the ethical concepts in biotechnology.

**CLO3.** To emphasize on IPR issues and need for knowledge in patents in biotechnology.

**COURSE OUTCOMES:**

<b>CO1</b>	Explain the the rules governing manufacture
<b>CO2</b>	Describe the ethical issues related to biotechnology research.
<b>CO3</b>	Explain the various forms of IPR, methods of application of Patents, Protection of Plant varieties and farmer rights
<b>CO4</b>	Overview of the Indian Patent Law

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Introduction to science, technology and society	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Case studies/experiences from	13/9/23	1	T1, R2	Smart

			developing and developed countries.				board , ppt
3.	14/9/23	3	Ownership, monopoly, traditional knowledge, biodiversity, benefit sharing, environmental sustainability	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	public vs. private funding,	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	biotechnology in international relations,	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	globalization and development divide.	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	Principle components of fermentor.	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	Modes of fermentation: Batch, continuous and fed-batch. Estimation techniques biochemical	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Fermentation	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Principle components of fermentor.	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	Modes of fermentation: Batch, continuous and fed-batch. Estimation techniques biochemical	28/9/23	3	T1, R2	Smart board , ppt
12	29/9/23	1	Introduction, types of fermentation Process,	29/9/23	1	T1, R2	Smart board , ppt
13	29/9/23	2	submerged and solid-state fermentation.	29/9/23	2	T1, R2	Smart board , ppt
14	29/9/23	1	Contamination of ground water, sea water ingress, problems and solutions	29/9/23	1	T1, R2	Smart board , ppt
15	2/10/23	3	Contamination of ground water, sea water ingress, problems and solutions	2/10/23	3	T1, R2	Smart board , ppt
16	2/10/23	1	Air: Introduction,	2/10/23	1	T1, R2	Smart board , ppt
17	4/10/23	2	composition, sources and classification of air	4/10/23	2	T1, R2	Smart board , ppt
18	5/10/23	1	pollutants, National Ambient Air quality standards (NAAQS),	5/10/23	1	T1, R2	Smart board , ppt
19	6/10/23	3	Air quality index, effects of air pollution on human health	6/10/23	3	T1, R2	Smart board , ppt

20	9/10/23	1	biologics, medical devices,	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	foods, seeds and testing.	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	Role of regulatory bodies FDA,	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	DCGI	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	<b>CIE 1</b>						
25	17/9/23							
26	18/9/23							
27	25/10/23	1	Public acceptance issues for biotechnology	25/10/23	1	T1, R2	Smart board , ppt	
28	26/10/23	2	Biotechnology and hunger	26/10/23	2	T1, R2	Smart board , ppt	
29	27/10/23	1	Challengesfor the Indian	27/10/23	1	T1, R2	Smart board , ppt	
30	30/10/23	3	Biotechnological research and industries	30/10/23	3	T1, R2	Smart board , ppt	
31	2/11/23	1	Intellectual property rights	2/11/23	1	T1, R2	Smart board , ppt	
32	3/11/23	2	TRIP- GATT International conventions patents	3/11/23	2	T1, R2	Smart board , ppt	
33	6/11/23	1	Legal implications Biodiversity and farmer rights .	6/11/23	1	T1, R2	Smart board , ppt	
34	8/11/23	3	Objectives of the patent system	8/11/23	3	T1, R2	Smart board , ppt	
35	9/11/23	1	Methods of application of patents biotechnology .	9/11/23	1	T1, R2	Smart board , ppt	
36	10/11/23	2	The patenting of living organisms.	10/11/23	2	T1, R2	Smart board , ppt	
37	13/11/23	1	Legal development-Patentable subjects and protection in	13/11/23	1	T1, R2	Smart board , ppt	
38	15/11/23	3	Biotechnological inventions and patent law.	15/11/23	3	T1, R2	Smart board , ppt	
39	16/11/23	1	anticipate changes to instrumentation and diagnostics	16/11/23	1	T1, R2	Smart board , ppt	

40	17/11/23	2	Basic principles and general requirements of patent law	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity


Sr. No.	CCE Component	Submission due Date
1	ASSIGNMENT	12/9/2023
2	ASSIGNMENT	17/11/23

**Text Books:**

1. Bioethics & Biosafety by R Rallapalli & Geetha Bali APH Publication, 2007

**Reference Book:**

- Odum, E.P., “Fundamentals of Ecology”, W.B sounders, Philadelphia, USA, 1971



Faculty  
(Dr. Nair Sreecha Chandran)



HOD

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(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF BIOTECHNOLOGY**

**LESSON PLAN**

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: 21BT71/ UPSTREAM AND DOWNSTREAM BIOPROCESS**

**TECHNOLOGY**

**Year/Sem/Section 4th YEAR / 7th SEM**

**COURSE OBJECTIVES** This course will enable the students to

therein. **CLO1.** To develop an understanding in students about the Upstream processes and the key aspects involved

**CLO2.** To learn the various separation techniques in Downstream processing.

**CLO3.** To list the methods involved in product recovery and enrichment.

**CLO4.** To be able to deduce the methods for scaling up in bioprocess industries.

**COURSE OUTCOMES:**

<b>CO1</b>	Develop complete understanding of the fermentation process.
<b>CO2</b>	Correlate the concepts involved in USP and DSP.
<b>CO3</b>	Analyze the methods involved in separation and product recovery techniques.
<b>CO4</b>	Apply the design concepts for scale-up operations.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Basic principles	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Techniques, general requirements of Plant cell / tissue culture techniques	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	Animal & Microbial Cell culture techniques.	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	Strain improvement strategies and Product yield	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	Preservation of microbial culture, Elicitation.	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	Fermentation:Introduction, types of fermentation Process, submerged and solid-state fermentation.	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	Principle components of fermentor.	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	Modes of fermentation: Batch, continuous and fed-batch. Estimation techniques biochemical	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Fermentation	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Principle components of fermentor.	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	Modes of fermentation: Batch, continuous and fed-batch. Estimation techniques biochemical	28/9/23	3	T1, R2	Smart board , ppt
12	29/9/23	1	Introduction, types of fermentation Process,	29/9/23	1	T1, R2	Smart board , ppt
13	29/9/23	2	submerged and solid-state fermentation.	29/9/23	2	T1, R2	Smart board , ppt

14	29/9/23	1	Contamination of ground water, sea water ingress, problems and solutions	29/9/23	1	T1, R2	Smart board , ppt	
15	2/10/23	3	Contamination of ground water, sea water ingress, problems and solutions	2/10/23	3	T1, R2	Smart board , ppt	
16	2/10/23	1	Air: Introduction,	2/10/23	1	T1, R2	Smart board , ppt	
17	4/10/23	2	composition, sources and classification of air	4/10/23	2	T1, R2	Smart board , ppt	
18	5/10/23	1	pollutants, National Ambient Air quality standards (NAAQS),	5/10/23	1	T1, R2	Smart board , ppt	
19	6/10/23	3	Air quality index, effects of air pollution on human health	6/10/23	3	T1, R2	Smart board , ppt	
20	9/10/23	1	biologics, medical devices,	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	foods, seeds and testing.	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	Role of regulatory bodies FDA,	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	DCGI	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	<b>CIE 1</b>						Harm
25	17/9/23							Harm
26	18/9/23							Impl
27	25/10/23	1	Chromatography- TLC, GLC, Ion Exchange,	25/10/23	1	T1, R2	Smart board , ppt	
28	26/10/23	2	Gel Filtration Chromatography, Affinity Chromatography	26/10/23	2	T1, R2	Smart board , ppt	
29	27/10/23	1	HPLC – analytical and preparative.	27/10/23	1	T1, R2	Smart board , ppt	
30	30/10/23	3	Electrophoretic and hybrid separation technologies.	30/10/23	3	T1, R2	Smart board , ppt	

31	2/11/23	1	Membrane separation- Design and configuration of membrane separation equipment	2/11/23	1	T1, R2	Smart board , ppt
32	3/11/23	2	Solute polarization and cake formation in membrane ultra-filtration – causes,	3/11/23	2	T1, R2	Smart board , ppt
33	6/11/23	1	consequences and control techniques	6/11/23	1	T1, R2	Smart board , ppt
34	8/11/23	3	Use of membrane diffusion, separation by solvent membranes;	8/11/23	3	T1, R2	Smart board , ppt
35	9/11/23	1	Scale Up concepts	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Adjust your formula for larger scale (lab to pilot to industrial scale)	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	Identify relevant building planning codes	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Select the right equipment	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	anticipate changes to instrumentation and diagnostics	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	anticipate changes to instrumentation and diagnostics.	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	12/9/2023
2	ASSIGNMENT	17/11/23

**Text Books:**

1. Downstream Process Technology – A new horizon in Biotechnology by Nooralabetta Krishna Prasad, PHI Learning Private Limited, 2010.

**Reference Book:**

Odum, E.P., “Fundamentals of Ecology”, W.B sounders, Philadelphia, USA, 1971



Faculty  
(Dr. Nair Sreecha Chandran)



HOD

Dr. B.K. MANJUNATHA  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.

IOAC





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Administrative Office:

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**DEPARTMENT OF BIOTECHNOLOGY**

**LESSON PLAN**

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: 21BT482/ Quality control and Quality assurance**

**Year/Sem/Section 2<sup>nd</sup> YEAR / 4th SEM**

**COURSE OBJECTIVES** This course will enable the students to  
CLO1.To understand the various aspects of quality control and quality assurance in BT industries.  
CLO2. To know the various guidelines and regulations, tools and tests, documentation, certifications, etc.

**COURSE OUTCOMES:**

<b>CO1</b>	Apply the Principles of Quality Management, QC and QA in the BT industry.
<b>CO2</b>	Understand the various guidelines and apply the same in the Pharma and Food industry.
<b>CO3</b>	Analyse raw materials and finished products in line with the standards.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Definition of Quality, Dimensions of Quality	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Principles of Quality. Concept of Quality and Quality Management	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	Checklists, Fishbone diagram, Control chart	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	Stratification	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	Pareto chart	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	Histogram, Scatter Diagram, Use of statistical	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	Definition of Quality, Dimensions of Quality	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	Principles of Quality. Concept of Quality and Quality Management	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Checklists, Fishbone diagram, Control chart	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Stratification	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	Pareto chart	28/9/23	3	T1, R2	Smart board , ppt
12	29/9/23	1	Histogram, Scatter Diagram, Use of statistical	29/9/23	1	T1, R2	Smart board , ppt
13	29/9/23	2	Definition of Quality, Dimensions of Quality	29/9/23	2	T1, R2	Smart board , ppt
14	29/9/23	1	Principles of Quality. Concept of Quality and Quality Management	29/9/23	1	T1, R2	Smart board , ppt
15	2/10/23	3	Checklists, Fishbone diagram, Control chart	2/10/23	3	T1, R2	Smart board , ppt
16	2/10/23	1	Stratification	2/10/23	1	T1, R2	Smart board , ppt

17	4/10/23	2	Pareto chart	4/10/23	2	T1, R2	Smart board , ppt	
18	5/10/23	1	Concept, meaning and importance in Biotechnology industry (products and services).	5/10/23	1	T1, R2	Smart board , ppt	
19	6/10/23	3	pharmaceuticals/drugs	6/10/23	3	T1, R2	Smart board , ppt	
20	9/10/23	1	biologics, medical devices,	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	foods, seeds and testing.	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	Role of regulatory bodies FDA,	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	DCGI	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	CIE 1						Har
25	17/9/23							Har
26	18/9/23							Impl
27	25/10/23	1	Pareto chart	25/10/23	1	T1, R2	Smart board , ppt	
28	26/10/23	2	Concept, meaning and importance in Biotechnology industry (products and services).	26/10/23	2	T1, R2	Smart board , ppt	
29	27/10/23	1	pharmaceuticals/drugs	27/10/23	1	T1, R2	Smart board , ppt	
30	30/10/23	3	biologics, medical devices,	30/10/23	3	T1, R2	Smart board , ppt	
31	2/11/23	1	foods, seeds and testing.	2/11/23	1	T1, R2	Smart board , ppt	
32	3/11/23	2	Role of regulatory bodies FDA,	3/11/23	2	T1, R2	Smart board , ppt	
33	6/11/23	1	Pareto chart	6/11/23	1	T1, R2	Smart board , ppt	
34	8/11/23	3	Concept, meaning and importance in Biotechnology industry (products and services).	8/11/23	3	T1, R2	Smart board , ppt	

35	9/11/23	1	pharmaceuticals/drugs	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Role of regulatory bodies FDA,	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	Pareto chart	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Concept, meaning and importance in Biotechnology industry (products and services).	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	pharmaceuticals/drugs	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	Role of regulatory bodies FDA,	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
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1	ASSIGNMENT	12/9/2023
2	ASSIGNMENT	17/11/23

**Text Books:**

1. Good laboratory Practice Regulations – Allen F. Hirsch, Volume 38, Marcel Dekker Series, 1989.

**Reference Book:**

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.



Faculty

(Dr. Nair Sreecha Chandran)



HOD

DR. B.K. MANJUNATHA  
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IQ



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**DEPARTMENT OF BIOTECHNOLOGY**

**LESSON PLAN**

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: 21BT51/ BIOKINETICS & BIOREACTION**

**ENGINEERING Year/Sem/Section 3<sup>rd</sup> YEAR / 5th SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To discuss the different models of chemical reactions and how various factors such as temperature affect reaction rate.

CLO2. To study the performance and distinguish between the different types of ideal and non ideal reactors.

CLO3. To determine the optimum pH, temperature and concentration of an enzyme.

CLO4. To understand the aspects of substrate affinity and enzyme inhibition.

CLO4. To describe medium requirements and medium formulation for maximizing the yield

**COURSE OUTCOMES:**

<b>CO1</b>	Detail the mechanism and kinetics of chemical, enzyme and microbial reactions.
<b>CO2</b>	Identify and summarize the parameters from a range of reactions to optimize reactor design and development.
<b>CO3</b>	Demonstrate the use of various scientific parameters to improve the performance of fermentation process.
<b>CO4</b>	Formulate a suitable media for maximized microbial growth and product yields, by analysing various parameters

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Law of mass action and rate equation	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Definitions and examples of elementary and non elementary reactions	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	Design equations for homogeneous system - batch	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	stirred tank and tubular flow reactor, size comparison of single reactors, combination of reactor systems	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	Qualitative design for parallel and series reactors.	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	Batch growth kinetics	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	size comparison of single reactors,	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	combination of reactor systems	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Elemental balance of biological conversion with and without extracellular product formation,	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Degree of reduction	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	Theoretical prediction of yield coefficients	28/9/23	3	T1, R2	Smart board , ppt



12	29/9/23	1	Factors affecting microbial growth	29/9/23	1	T1, R2	Smart board , ppt	
13	29/9/23	2	Monod growth kinetics	29/9/23	2	T1, R2	Smart board , ppt	
14	29/9/23	1	Conceptual numericals.Case studies.	29/9/23	1	T1, R2	Smart board , ppt	
15	2/10/23	3	Checklists, Fishbone diagram, Control chart	2/10/23	3	T1, R2	Smart board , ppt	
16	2/10/23	1	Stratification	2/10/23	1	T1, R2	Smart board , ppt	
17	4/10/23	2	Pareto chart	4/10/23	2	T1, R2	Smart board , ppt	
18	5/10/23	1	Concept, meaning and importance in Biotechnology industry (products and services).	5/10/23	1	T1, R2	Smart board , ppt	
19	6/10/23	3	pharmaceuticals/drugs	6/10/23	3	T1, R2	Smart board , ppt	
20	9/10/23	1	biologics, medical devices,	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	foods, seeds and testing.	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	Role of regulatory bodies FDA,	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	DCGI	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	<b>CIE 1</b>						Harn
25	17/9/23							Harn
26	18/9/23							Impl
27	25/10/23	1	Medium requirements for fermentation processes	25/10/23	1	T1, R2	Smart board , ppt	
28	26/10/23	2	Carbon, nitrogen,	26/10/23	2	T1, R2	Smart board , ppt	
29	27/10/23	1	oxygen requirements	27/10/23	1	T1, R2	Smart board , ppt	
30	30/10/23	3	examples of simple and complex media thermal death kinetics of	30/10/23	3	T1, R2	Smart board , ppt	

			microorganisms				
31	2/11/23	1	Batch and continuous heat – Sterilization of Liquid media	2/11/23	1	T1, R2	Smart board , ppt
32	3/11/23	2	Filter sterilization of liquid media. Case studies.	3/11/23	2	T1, R2	Smart board , ppt
33	6/11/23	1	minerals	6/11/23	1	T1, R2	Smart board , ppt
34	8/11/23	3	vitamins and other complex nutrients	8/11/23	3	T1, R2	Smart board , ppt
35	9/11/23	1	pharmaceuticals/drugs	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Role of regulatory bodies FDA,	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	Pareto chart	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Concept, meaning and importance in Biotechnology industry (products and services).	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	pharmaceuticals/drugs	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	Role of regulatory bodies FDA,	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
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- ix) Class presentations
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- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
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- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	12/9/2023
2	ASSIGNMENT	17/11/23

**Text Books:**

1. Biology for Engineers, Arthur T. Johnson, CRC Press, Taylor and Francis, 2011.

**Reference Book:**

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.



Faculty

(Dr. Nair Sreecha Chandran)



HOD

DR. B.K. MANJUNATHA  
 Professor & Head  
 Department of Biotechnology  
 The Oxford College of Engineering  
 Bengaluru-560 068.

IOAC





**OR**

B. Sustainability management and entrepreneurship opportunities in bio-based products are crucial for the development of a sustainable and circular economy.

### **Sustainability Management in Bio-based Products**

Sustainability management in bio-based products involves the integration of environmental, social, and economic considerations into the production and consumption of bio-based products. This includes:

1. Life Cycle Assessment (LCA): Evaluating the environmental impacts of bio-based products throughout their entire life cycle, from raw material extraction to end-of-life disposal or recycling.
2. Supply Chain Management: Ensuring that the supply chain for bio-based products is transparent, responsible, and sustainable.
3. Certification and Labeling: Obtaining certifications and labels that ensure the sustainability and environmental performance of bio-based products.
4. Stakeholder Engagement: Engaging with stakeholders, including customers, suppliers, and local communities, to ensure that their needs and concerns are addressed.

3

### **Entrepreneurship Opportunities in Bio-based Products**

The bio-based products industry offers numerous entrepreneurship opportunities, including:

1. Development of New Bio-based Products: Developing new bio-based products that can replace traditional fossil-based products.
2. Biorefineries: Establishing biorefineries that can convert biomass into a range of bio-based products.
3. Biotechnology: Applying biotechnology to develop new bio-based products and processes.
4. Circular Economy Business Models: Developing business models that promote the reuse and recycling of bio-based products.
5. Sustainable Agriculture: Promoting sustainable agriculture practices that can provide the feedstock for bio-based products.

2

Q3

A. Synzymes are synthetic enzymes that are designed to mimic the structure and function of natural enzymes. They are typically composed of a non-natural scaffold, such as a polymer or a metal complex, that is functionalized with catalytic groups.

Synzymes are designed to catalyze specific chemical reactions, and they have the potential to offer improved stability, selectivity, and activity compared to natural enzymes. Synzymes can be used in a variety of applications, including biocatalysis, biosensing, and biomedical research.

### **Host-Guest Complexation Chemistry**

Host-Guest Complexation Chemistry refers to the binding of a guest molecule to a host molecule through non-covalent interactions, such as:

1. Hydrogen bonding
2.  $\pi$ - $\pi$  stacking
3. Van der Waals forces
4. Electrostatic interactions

The host molecule provides a cavity or binding site that complements the shape and chemical properties of the guest molecule. This binding event can lead to changes in the chemical and

3



physical properties of the guest molecule.

### Enzyme Design using Steroids

Steroids are a class of biomolecules that have been used as scaffolds for enzyme design. Steroids have a rigid, planar structure that can provide a stable platform for the attachment of catalytic groups.

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Here are some key aspects of enzyme design using steroids:

1. Steroid scaffold: The steroid scaffold provides a rigid, planar structure that can be functionalized with catalytic groups.
2. Catalytic groups: Catalytic groups, such as amino acids, peptides, or metal complexes, are attached to the steroid scaffold to create a catalytically active site.
3. Substrate binding: The steroid scaffold is designed to bind to a specific substrate, positioning it for catalysis.
4. Catalytic activity: The catalytic groups attached to the steroid scaffold facilitate the chemical reaction, converting the substrate into a product.

OR

**B. Semi-synthetic enzymes** are enzymes that have been modified through chemical or genetic means to enhance their catalytic properties or to introduce new functions. They are called "semi-synthetic" because they are derived from natural enzymes, but have been modified to some extent.

Semi-synthetic enzymes can be created through various methods, including:

1. Chemical modification: Chemical reagents can be used to modify specific amino acid residues in an enzyme, altering its catalytic properties.
2. Site-directed mutagenesis: This involves introducing specific mutations into an enzyme's gene sequence to alter its catalytic properties.

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Semi-synthetic enzymes have several advantages over natural enzymes, including:

1. Improved catalytic efficiency: Semi-synthetic enzymes can be designed to have improved catalytic efficiency, allowing them to convert substrates into products more quickly and efficiently.
2. Enhanced stability: Semi-synthetic enzymes can be designed to be more stable than natural enzymes, allowing them to withstand extreme temperatures, pH, and other environmental conditions.

Examples of semi-synthetic enzymes include:

1. Subtilisin: A semi-synthetic enzyme that has been engineered to have improved catalytic efficiency and stability.
2. Lipase: A semi-synthetic enzyme that has been engineered to have improved catalytic efficiency and specificity for certain substrates.
3. Amylase: A semi-synthetic enzyme that has been engineered to have improved catalytic efficiency and stability.

2

**Abzymes**, also known as catalytic antibodies, are antibodies that possess catalytic activity, similar to enzymes. They are produced by the immune system in response to the presence of a specific antigen, and can be engineered to catalyze a wide range of chemical reactions.

### Characteristics of Abzymes

1. Antibody structure: Abzymes have a typical antibody structure, consisting of two heavy

	<p>chains and two light chains.</p> <ol style="list-style-type: none"> <li>2. <b>Catalytic activity:</b> Abzymes possess catalytic activity, which is mediated by the binding of the substrate to the antibody's active site.</li> <li>3. <b>Specificity:</b> Abzymes can be highly specific for their substrates, allowing for precise control over the catalytic reaction.</li> <li>4. <b>Stability:</b> Abzymes can be highly stable, allowing for repeated use and storage.</li> </ol> <p><b>Peptide synthesis</b> is the process of creating peptides, which are short chains of amino acids, through chemical synthesis. Peptides are important in many biological processes, and their synthesis has numerous applications in fields such as medicine, agriculture, and biotechnology.</p> <p>Methods of Peptide Synthesis</p> <p>There are several methods of peptide synthesis, including:</p> <ol style="list-style-type: none"> <li>1. <b>Solid-phase peptide synthesis (SPPS):</b> This is the most common method of peptide synthesis. It involves attaching the amino acids to a solid support, such as a resin, and then building the peptide chain step by step.</li> <li>2. <b>Liquid-phase peptide synthesis:</b> This method involves synthesizing the peptide in a liquid solution, rather than on a solid support.</li> <li>3. <b>Hybrid peptide synthesis:</b> This method combines elements of SPPS and liquid-phase synthesis.</li> <li>4. <b>Native chemical ligation (NCL):</b> This method involves the use of a thioester to form a peptide bond between two peptide fragments.</li> </ol> <p>Steps Involved in Peptide Synthesis</p> <p>The steps involved in peptide synthesis vary depending on the method used, but the general process involves:</p> <ol style="list-style-type: none"> <li>1. <b>Selection of amino acids:</b> The amino acids to be used in the synthesis are selected and prepared.</li> <li>2. <b>Activation of the amino acids:</b> The amino acids are activated to form reactive intermediates.</li> <li>3. <b>Coupling of the amino acids:</b> The activated amino acids are coupled together to form a peptide bond.</li> <li>4. <b>Deprotection of the peptide:</b> The peptide is deprotected to remove any protecting groups that were used during the synthesis.</li> <li>5. <b>Purification of the peptide:</b> The peptide is purified to remove any impurities or byproducts.</li> </ol>	
Q4	<p>A. A. <b>Diagnostic enzymes</b> are enzymes that are used as diagnostic tools to detect and monitor various diseases and conditions. These enzymes are often used in clinical laboratory tests to measure the levels of specific biomarkers in blood, urine, or other bodily fluids.</p> <p>Characteristics of Diagnostic Enzymes</p> <ol style="list-style-type: none"> <li>1. <b>Specificity:</b> Diagnostic enzymes are highly specific for their substrates, allowing for accurate detection of specific biomarkers.</li> <li>2. <b>Sensitivity:</b> Diagnostic enzymes are highly sensitive, allowing for detection of small changes in biomarker levels.</li> <li>3. <b>Stability:</b> Diagnostic enzymes are stable under various conditions, allowing for reliable and consistent results.</li> <li>4. <b>Ease of use:</b> Diagnostic enzymes are often easy to use and can be incorporated into various diagnostic assays.</li> </ol> <p>Examples of Diagnostic Enzymes</p>	3

	<p>1. Creatine kinase (CK): CK is an enzyme that is used to diagnose and monitor muscle damage, such as myocardial infarction.</p> <p>2. Lactate dehydrogenase (LDH): LDH is an enzyme that is used to diagnose and monitor tissue damage, such as liver damage.</p> <p>3. Alanine transaminase (ALT): ALT is an enzyme that is used to diagnose and monitor liver damage, such as hepatitis.</p> <p>Advantages of Diagnostic Enzymes</p> <p>1. High sensitivity and specificity: Diagnostic enzymes offer high sensitivity and specificity, allowing for accurate detection of biomarkers.</p> <p>2. Ease of use: Diagnostic enzymes are often easy to use and can be incorporated into various diagnostic assays.</p> <p>3. Rapid results: Diagnostic enzymes can provide rapid results, allowing for timely diagnosis and treatment.</p> <p>4. Cost-effective: Diagnostic enzymes can be cost-effective, particularly when compared to other diagnostic methods.</p> <p style="text-align: center;"><b>OR</b></p> <p><b>B. Therapeutic enzymes</b> are enzymes that are used to treat or manage various diseases and conditions. These enzymes can be derived from natural sources, such as plants, animals, or microorganisms, or they can be produced through recombinant DNA technology.</p> <p>Types of Therapeutic Enzymes</p> <p>1. Digestive enzymes: These enzymes, such as amylase, lipase, and trypsin, are used to treat digestive disorders, such as pancreatic insufficiency and celiac disease.</p> <p>2. Antifibrinolytic enzymes: These enzymes, such as aprotinin, are used to treat bleeding disorders, such as hemophilia.</p> <p>3. Anti-inflammatory enzymes: These enzymes, such as serrapeptase, are used to treat inflammatory conditions, such as arthritis and asthma.</p> <p>4. Anticancer enzymes: These enzymes, such as asparaginase, are used to treat certain types of cancer, such as leukemia.</p> <p>5. Replacement enzymes: These enzymes, such as enzyme replacement therapy (ERT), are used to treat genetic disorders, such as Gaucher's disease and Fabry disease.</p>	2
Q5	<p>A. Protease and amylase are two types of enzymes that play a crucial role in the detergent industry.</p> <p><b>Role of Protease in Detergent Industry</b></p> <p>Protease is an enzyme that breaks down protein-based stains, such as blood, sweat, and grass, into smaller peptides and amino acids. In the detergent industry, protease is used to:</p> <p>1. Remove protein-based stains: Protease helps to break down and remove protein-based stains, leaving clothes cleaner and fresher.</p> <p>2. Improve washing performance: Protease helps to improve the washing performance of detergents by breaking down protein-based stains and allowing them to be easily removed.</p> <p>3. Reduce fabric damage: Protease can help to reduce fabric damage caused by protein-based stains, which can weaken or discolor fabrics.</p> <p><b>Role of Amylase in Detergent Industry</b></p> <p>Amylase is an enzyme that breaks down starch-based stains, such as food and grass, into simpler sugars. In the detergent industry, amylase is used to:</p>	3

<p>1. Remove starch-based stains: Amylase helps to break down and remove starch-based stains, leaving clothes cleaner and fresher.</p> <p>2. Improve washing performance: Amylase helps to improve the washing performance of detergents by breaking down starch-based stains and allowing them to be easily removed.</p> <p>3. Reduce fabric damage: Amylase can help to reduce fabric damage caused by starch-based stains, which can weaken or discolor fabrics.</p>	2
<p><b>OR</b></p> <p>B. Enzymes play a crucial role in the leather industry, where they are used to improve the quality and appearance of leather products. Here are some of the ways enzymes are used in the leather industry:</p> <p><b>Bating</b> Enzymes are used in the bating process to break down the proteins in the skin, such as collagen and elastin. This helps to soften the skin, making it more supple and easier to work with.</p> <p><b>Deliming</b> Enzymes are used in the deliming process to remove excess lime from the skin. This helps to prevent the skin from becoming too alkaline, which can cause it to become brittle and prone to cracking.</p> <p><b>Pickling</b> Enzymes are used in the pickling process to help break down the proteins in the skin and to remove excess flesh and fat.</p> <p><b>Tanning</b> Enzymes are used in the tanning process to help stabilize the collagen fibers in the skin and to improve the leather's strength and durability.</p> <p><b>Dyeing and Finishing</b> Enzymes are used in the dyeing and finishing process to help improve the leather's color and texture. Enzymes can be used to break down excess dye and to improve the leather's water repellency.</p>	3
<p><b>Types of Enzymes Used in Leather Industry</b></p> <p>1. Proteases: Proteases are enzymes that break down proteins into smaller peptides and amino acids.</p> <p>2. Lipases: Lipases are enzymes that break down fats and oils into smaller fatty acids and glycerol.</p> <p>3. Amylases: Amylases are enzymes that break down starches into smaller sugars.</p> <p>4. Cellulases: Cellulases are enzymes that break down cellulose into smaller sugars.</p>	2





**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

**THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**DEPARTMENT OF BIOTECHNOLOGY**

**LESSON PLAN**

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 20/10/23 to 16/11/24**

**SUB.CODE & Name: BBT301 / CELL BIOLOGY**

**Year/Sem/Section 2<sup>nd</sup> YEAR / 3<sup>rd</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Co-relate cellular structure-function relationship in the context of cell growth and death.

CLO2. Apply the concepts of cell signalling to biofilm formation.

CLO3. Apply the principles of Mendelian Genetics to understand gene interactions, multiple alleles and sex-linked inheritance.

CLO4. Apply principles of Chromosome structure and gene frequencies in the context of inherited disorders and population genetics.

**COURSE OUTCOMES:**

<b>CO1</b>	Co-relate cellular structure-function relationship in the context of cell growth and death.
<b>CO2</b>	Apply the concepts of cell signalling to biofilm formation.
<b>CO3</b>	Apply the principles of Mendelian Genetics to understand gene interactions, multiple alleles and sex-linked inheritance.
<b>CO4</b>	Apply principles of Chromosome structure and gene frequencies in the context of inherited disorders and population genetics.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Prokaryotic and eukaryotic cell	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Cell Architecture	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	physio-chemical nature of plasma membrane and functions of cell	14/9/23	3	T1, R2	Smart

			organelle; nucleus				<b>board , ppt</b>
<b>4.</b>	15/9/23	1	mitochondria, chloroplast	15/9/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>5.</b>	18/9/23	2	Cytoskeletal elements	18/9/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>6.</b>	20/9/23	1	ribosomes, peroxisomes	20/9/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>7.</b>	21/9/23	3	Microtubules: structure & functions, shaping of the cells and mechanical support.	21/9/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>8.</b>	22/9/23	1	Microfilaments: structure & functions. Structure of intermediate filaments.	22/9/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>9.</b>	25/9/23	2	Cytoplasmic micro trabecular system (lattice).	25/9/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>10</b>	27/9/23	1	Covalent modifications of cytosmeat	27/9/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>11</b>	28/9/23	3	Cell cycle studies; mitosis and meiosis. Cell Birth, lineage and death	28/9/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>12</b>	29/9/23	1	Cellular senescence and ageing, Hayflick phenomenon, Senescence in ageing and age-related disease	29/9/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>13</b>	29/9/23	2	Apoptosis and Necrosis, Cancer Cell Biology	29/9/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>14</b>	29/9/23	1	Asymmetrical cell division, patterns of stem cell division.	29/9/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>15</b>	2/10/23	3	Signalling molecules and cell surface, receptors	2/10/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>16</b>	2/10/23	1	Intracellular signal transduction; G protein coupled receptor	2/10/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>17</b>	4/10/23	2	plant growth factors and hormones	4/10/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>18</b>	5/10/23	1	Eukaryotic and Prokaryotic cell to cell signalling, endocrine signalling	5/10/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>19</b>	6/10/23	3	Quorum sensing and intercellular signalling, Signal peptides, biofilm formation.	6/10/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>20</b>	9/10/23	1	Membrane transport, passive and active transport; transport into prokaryotic cell	9/10/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>21</b>	11/10/23	2	Endomembrane System: Golgi, Lysosomes Vesicular Traffic, Secretion, and Endocytosis, exocytosis	11/10/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>22</b>	12/9/23	1	Entry of viruses and toxins into cells Membrane trafficking: Translocation of secretory proteins across the ER membrane	12/9/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>



23	13/9/23	3	protein modifications, folding and quality control in the ER; export and sorting of proteins to mitochondria,	13/9/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
24	16/9/23	<b>CIE 1</b>						Harn
25	17/9/23							Harn
26	18/9/23							Impl
27	25/10/23	1	Nature of genetic material, Mendelian Laws of inheritance, monohybrid and dihybrid inheritance, law of segregation & independent assortment	25/10/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
28	26/10/23	2	Gene interactions, supplementary genes - Comb patterns in fowls,	26/10/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
29	27/10/23	1	Complementary genes - Flower color in sweet peas,	27/10/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
30	30/10/23	3	Epistasis- Inhibitory and colored genes in fowls, simple problems	30/10/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
31	2/11/23	1	Sex determination in plants, animals XX-XY, XX-XO, ZW-ZZ, ZO-ZZ types in animals. Chromosomal disorders.	2/11/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
32	3/11/23	2	Sex linked inheritance molecular diseases, hemoglobinopathies.	3/11/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
33	6/11/23	1	Disorders of coagulation, Colour blindness, hemophilia,	6/11/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
34	8/11/23	3	Non-disjunction as a proof of chromosomal theory of inheritance, Linkage maps	8/11/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
35	9/11/23	1	Crossing over. Chromosomal maps, interference coincidence.	9/11/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
36	10/11/23	2	prospects for the control of human evolution.	10/11/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
37	13/11/23	1	Spontaneous and induced mutations, Eugenics. Pedigree analysis	13/11/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
38	15/11/23	3	Introduction, Gene frequency, and equilibrium estimation, changes in gene frequency, inbreeding and heterosis,	15/11/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
39	16/11/23	1	genetic structure of population, speciation and evolution,	16/11/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
40	17/11/23							

41	20/11/23	CIE 2
42	21/11/23	

## Continuous and Comprehensive Evaluation (CCE)

### Faculty can choose any two of the following:


- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

- **Text Books:**

The Cell – A Molecular Approach, Cooper & Hausman, ASM Press, 2004

### Reference Book:

1. <https://www.cambridge.org/core/books/abs/plant-physiology/plant-hormones-and-signal-transduction/9A8F77D94D53C30A70F3B6A406CFB187>



Faculty  
(Dr. Nair Sreecha Chandran)



HOD

Dr. B.K. MANJUNATHA  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.

IOAC



Children's Education Society @  
THE OXFORD COLLEGE OF ENGINEERING  
DEPARTMENT OF AIML

(Approved by AICTE, New Delhi, Accredited by NAAC & NBA, New Delhi & Affiliated to VTU, Belgaum)

Lesson Plan

Faculty Name: Dr. Joseph Fernandes

Academic Year: 2023-24 Even Sem

SUB.CODE & Name: 21BT644/STEM CELL TECHNOLOGY

Year/Sem/Section: 2year/4 sem

COURSE OBJECTIVES: This course will enable the students to

CLO1: To provide a broad overview of stem cells, reviewing the different types and how they are cultured

CLO2: To familiarize the students with stem cell technology and its bioengineering applications

CLO3: To provide the students an appreciation of how biological systems can be re-designed as substitute products for natural systems

CLO4: To understand the potential of Stem cells towards treatment of human diseases

COURSE OUTCOMES: At the completion of the course the student will be able to:

CO1: Understand the basics of stem cell biology, the various types and their isolation and identification

CO2: Correlate stem cell technology in treatment of various diseases and disorders

CO3: Corroborate the concepts of biomimetics for specific requirements.

CO4: Apply the basics of stem cells in drug discovery and tissue engineering in line with ethical considerations

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
1.	29/4/24	1	Stem cells: Definition, Classification, Sources and Properties	29/4/24	1	T1	Chalk and Talk
2.	30/4/24	2	Types of stem cells: methods of isolation	30/4/24	2	T1	PPT
3.	2/5/24	3	study of stem cells and their viability: IPSC	2/5/24	3	T1	PPT
4.	6/5/24	1	embryonic stem cells, cancer stem cells	6/5/24	1	T1	Chalk and Talk
5.	7/5/24	2	Preservations of Stem cell	7/5/24	2	T1	PPT
6.	8/1/24	3	Embryonic stem cell: Isolation, Culturing, Differentiation, Properties	8/5/24	3	T1	PPT
7.	9/5/24	3	Adult stem cell: Isolation, Culturing, Differentiation, Trans-differentiation, Plasticity, and Properties	9/5/24	3	T1	NPTEL Videos
8.	13/5/24	1	Molecular mechanisms. fate mapping, application	13/5/24	1	T2	PPT
9.	14/5/24	2	Cell Culture Media, Cell culture methods	14/5/24	2	T2	PPT
10.	15/5/24	3	Cell isolation, selection, maintenance of primary and early passage cultures	15/5/24	3	T2	Chalk and Talk
11.	16/5/24	3	Clinical potential of stem cells: Organ and tissue regener	16/5/24	3	T2	PPT
12.	20/5/24	1	Tutorial: Stem cells and its applications	20/5/24	1		
13.	21/5/24	2	Germ cells, hematopoietic organs, and kidney, cord blood transplantation	21/5/24	2	T1	PPT
14.	22/5/24	3	donor selection, HLA matching, patient selection	22/5/24	3	T2	PPT
15.	23/5/24	3	peripheral blood and Hematopoietic Stem Cell Disorders and bone marrow transplantation	23/5/24	3	T2	NPTEL Videos
16.	27/5/24	1	Stem cell Techniques: fluorescence activated cell sorting (FACS),	27/5/24	1	R2	PPT
17.	28/5/24	2	Time lapse video, green fluorescent protein tagging	28/5/24	2	R2	PPT
18.	29/5/24	3	Stem cell and founder zones in plants	29/5/24	3	R2	PPT



Sl. no.	Date	Duration	Topic	Start Date	Duration	Room	Activity
19	30/5/24	3	roots- stem cells of shoot meristems of higher plants	30/5/24	3	R2	PPT
20	6/6/24	3	Skeletal muscle stem cell - Mammary stem cells	6/6/24	3	R2	Chalk and Talk
21	10/6/24	1	intestinal stem cells - keratinocyte stem cells of cornea	10/6/24	1	R2	Chalk and Talk
22	11/6/24	2	Skin and hair follicles - tumor stem cells	11/6/24	2	T2	PPT
23	12/6/24	3	Tutorial: Stem cell techniques	12/6/24	3	T1	PPT
24	13/6/24	3	Target identification, Manipulating differentiation pathways	13/6/24	3	T1	Chalk and Talk
25	18/6/24	2	stem cell therapy Vs cell protection	18/6/24	2	T1	PPT
26	19/6/24	3	stem cell in cellular assays for screening	19/6/24	3	R1	PPT
27	20/6/24	3	stem cell based drug discovery, drug screening and toxicology	20/6/24	3	R1	PPT
28	24/6/24	1	Tissue engineering application - production of complete organ - kidney	24/6/24	1	T2	PPT
29	25/6/24	2	eyes - heart - brain	25/6/24	2	T1	PPT
30	26/6/24	3	Tutorial: Stem cells and drug discovery	26/6/24	3		Chalk and Talk
31	27/6/24	3	Gene therapy	27/6/24	3	T2	PPT
32	1/7/24	1	genetically engineered stem cells	1/7/24	1	T2	PPT
33	2/7/24	2	stem cells and Animal cloning	2/7/24	2	R2	Chalk and Talk
34	8/7/24	1	transgenic animals and stem cells	8/7/24	1	R1/R2	PPT
35	9/7/24	2	Therapeutic applications - Cardiovascular treatment	9/7/24	2	R2	PPT
36	10/7/24	3	Cell deficiency therapy	10/7/24	3	T2/R2	PPT
37	11/7/24	3	treatment of brain related defects	11/7/24	3	R1	PPT
38	15/7/24	1	Neurological disorder (AD,PD)	15/7/24	1	T2/R1	PPT
39	16/7/24	2	limb amputation	16/7/24	2	T2	PPT
40	18/7/24	3	heart disease	18/7/24	3	T2	Chalk and Talk
41	22/7/24	1	spinal cord injuries	22/7/24	1	T1	PPT
42	23/7/24	2	diabetes -burns	23/7/24	2	T1	PPT
43	24/7/24	3	HLA typing- hepatic and pancreatic disorders	24/7/24	3	R1	PPT
44	29/7/24	1	Stem cell policy and ethics	29/7/24	1	R1	PPT
45	30/7/24	2	stem cell research: Hype, hope and controversy	30/7/24	2	T2	PPT
46	31/7/24	3	Tutorial: Gene therapy and therapeutic applications	31/7/24	3	T2	Chalk and Talk

### Continuous Comprehensive Evaluation

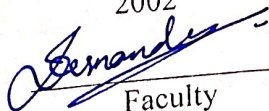
Sl. no.	CCE Component	Submission due date
1	Assignment	18/6/24
2	Online quiz/seminar/group Discussion	22/7/24

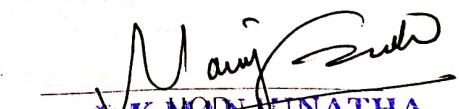
### Text books:

1. Stem cells by C.S Potten., Elsevier, 2006.
2. Essentials of Stem Cell Biology by Robert Lanza., fourth edition. Elsevier 2014.

### Reference books:

1. Stem cell biology and Gene Therapy by Peter Quesenberry., First Edition, Wiley-Liss, 1998
2. Embryonic Stem cells - Protocols by KursadTurksen., Second Edition Humana Press, 2002

  
Faculty

  
**DR. B.K. MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.





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DEPARTMENT OF BIOTECHNOLOGY

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Lesson Plan

Faculty Name: Dr.K.Valarmathy

Academic Year: 2023-24 Even Sem

SUB.CODE & Name: BBT405C/Bioprocess Principles & Stoichiometry

Year/Sem/Section: 2year/4 sem

COURSE OBJECTIVES : This course will enable the students to

CLO1: Learn fundamentals of chemical calculations and material and energy balance

CLO2: Discuss the material balance aspects involving chemical reactions and without chemical Reactions

CLO3: Highlight the energy balance and material balance for the development of bioprocess Technology

COURSE OUTCOMES: At the completion of the course the student will be able to:

CO1: Discuss the significance of material and energy balance for bioprocess technology.

CO2: Solve problems related to material and energy balance to give solutions for bioprocess development.

CO3: Develop the flow sheet for general processes operating in bioprocess industry.

CO4: Appreciate the stoichiometry of microbial growth and product formation involved in bioprocess technology.

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
1.	22/4/24	2	Concept of atom and mole -Definition and problems	22/4/24	2	T2 8-25	Chalk and talk
2.	23/4/24	2	Expressing Composition of mixtures and solutions- Percentage by weight, mole and Volume.- Definition, explanation of concept with examples and problems	23/4/24	2	T2 26-28, T3 26-33	Chalk and talk
3.	24/4/24	3	Expressing Composition of mixtures of in solids, liquids gases.- Definition ,explanation of concept with examples and problems	24/4/24	2	T2 ,26-32	Chalk and talk
4.	25/4/24	2	Normality, Molarity, Molality, - Definition ,explanation of concept with examples and problems	25/4/24	2	T3 2.5-2.13	Chalk and talk
5.	29/4/24	2	Numericals on Normality, molarity and molality.	29/4/24	2	T2 32-47	Chalk and talk
6.	30/4/24	2	Numericals on Normality, molarity and molality	30/4/24	2	T2 32-47	Chalk and talk
7.	2/5/24	2	Introduction to material balances, Generalized material balance equation, absorption and numerical- Definitions, explanation of block Diagram, explanation of concept with examples and problems	2/5/24	2	T2 61-67, T3 3.20-3.23, T3 3.25-3.33	Chalk and talk
8.	6/5/24	2	Generalized material balance equation for extraction , crystallization and its numericals- explanation of block Diagram, explanation of concept with examples and problems	6/5/24	2	T3 3.25-3.33, T2 331-340	Chalk and talk
9.	7/5/24	2	Generalized material balance equation for mixing, drying, Evaporation and its numericals-explanation of block Diagram, explanation of concept with examples and problems Derivations	7/5/24	2	T2 3.10-3.20, T3 3.10-3.20, T3 3.10-3.20	Chalk and talk
10.	8/5/24	3	Tutorials- Numericals				
11.	9/5/24	2	Material balances calculation in Distillation,-Problems	9/5/24	2		NPTEL Videos
12.	13/5/24	2	Material balances calculation in Absorption,-Problems	13/5/24	3	T3 3.20-3.23	Chalk and talk
				15/5/24	3	T3 3.25-3.33	Chalk and talk



13.	14/5/24	2	Material balances calculation in Extraction,-Problems	16/5/24	2	T3 3.25-3.33	Chalk and talk
14.	15/5/24	3	Material balances calculation in Crystallization,-Problems	16/5/24	2	T2 331-340	Chalk and talk
15.	16/5/24	2	Material balances calculation in Mixing,-Problems	20/5/24	2	T2 3.10-3.20	Chalk and talk
16.	20/5/24	2	Material balances calculation in Drying,-Problems	20/5/24	2	T3 3.10-3.20	Chalk and talk
17.	21/5/24	2	Material balances calculation in Evaporation,-Problems	21/5/24	2	T3 3.10-3.20	Chalk and talk
18.	22/5/24	3	Characteristics of fuels- Definition ,explanation of concept with examples and problems	22/5/24	2	T2 390-417	Chalk and talk
19.	23/5/24	2	Ultimate and proximate analyses of fuels.- Definition ,explanation of concept with examples and problems	23/5/24	2	T2 392-394	Chalk and talk
20.	27/5/24	2	Tutorial-numericals	27/5/24	2	-	Questioning based teaching
21.	28/5/24	2	Material balances involving bypass ,recycle & purge- ex Diagram, explanation of concept with examples and problems Derivations	28/5/24	2	T2 72, T2 80-87	Chalk and talk
22.	29/5/24	3	Numerical on recycle & purge, Generalized material balance block Diagram, explanation of concept with examples and problems Derivations	29/5/24	3	T2 80-87	Chalk and talk
23.	30/5/24	2	Principles of Stoichiometry, Definitions of limiting and excess reactants.	30/5/24	2	T1 62-64 T2 113-115	Chalk and talk
24.	3/6/24	2	Fractions and percentage conversion, yield and percentage yield.	3/6/24	2	T2 115-118, T3 64-69	Chalk and talk
25.	4/6/24	2	Selectivity and related problems.	4/6/24	2	T2 118-130	Chalk and talk
26.	5/6/24	3	Numericals involving neutralization process	5/6/24	3	T2 17-168	Chalk and talk
27.	6/6/24	2	Numericals involving oxidation process	6/6/24	2	T2 117-168	Chalk and talk
28.	18/6/24	2	Numericals involving nitration process	18/6/24	2	T2 117-168	Chalk and talk
29.	19/6/24	3	Numericals involving hydrolysis process	19/6/24	3	T2 117-168	Chalk and talk
30.	20/6/24	2	Tutorial: Numericals on M.B with reaction.	20/6/24	2		NPTEL Videos
31.	24/6/24	2	General energy balance equation for steady state.	24/6/24	2	T2 167-168	Chalk and talk
32.	25/6/24	2	Heat capacity, estimation of heat capacity for solids	25/6/24	2	T2 167-168	Chalk and talk
33.	26/6/24	3	Estimation of heat capacity for liquids gases and their mixtures	26/6/24	3	T2 173-198	Chalk and talk
34.	27/6/24	2	Enthalpy and its calculations	27/6/24	2	T2 250-256	Chalk and talk
35.	1/7/24	2	Standard Heat of formation,	1/7/24	2	T2 250-256	Chalk and talk
36.	2/7/24	2	standard heat of reaction,- explanation of block Diagram, explanation of concept with examples and problems Derivations	2/7/24	2	T2 246-250	Chalk and talk
37.	3/7/24	3	Standard heat of combustion and calorific value- explanation of block Diagram, explanation of concept with examples	3/7/24	3	T2 390-393	Chalk and talk



38.	4/7/24	2	and problems. Derivations				
39.	8/7/24	2	Calculation of heat of reaction at elevated temperature	4/7/24	2	T2 390-393	Chalk and talk
40.	9/7/24	2	Conceptual Numericals	8/7/24	2		Chalk and talk
41.	10/7/24	3	Tutorials - standard heat of reaction, Standard heat of combustion	9/7/24	2		Flipped Class rooms
42.	11/7/24	2	Historical Development of bioprocess technology	10/7/24	3	T4 21-28, T1 5-15	PPT
43.	15/7/24	2	Bioprocess principles and operations	11/7/24	2	T1 5-15	PPT
44.	16/7/24	2	Generalized process flow sheets, Generalized material balance equation for steady state	15/7/24	2	Internet notes	PPT
45.	18/7/24	2	General material balance equation for Penicillin- explanation Diagram, explanation of concept with examples and Problems. Derivations	16/7/24	2	T4 21-28, T1 5-15	PPT
46.	22/7/24	2	General material balance equation for Ethanol- explanation Diagram, explanation of concept with examples and problems Derivations	18/7/24	2	T4 21-28, T1 5-15	PPT
47.	23/7/24	2	Tutorial on role of BT	22/7/24	2		Flipped Class rooms
48.	24/7/24	3	Outline of a bioprocess and the various (upstream & downstream) unit operations involved in bioprocesses.	23/7/24	2	T4 21-28, T1 5-15	PPT
49.	25/7/24	2	Stoichiometry of microbial growth and product formation-problems	24/7/24	3	T4 227-237, T189-105	PPT
50.	1/8/24	2	Stoichiometry of microbial growth and product formation-problems	25/7/24	2	T4 227-237, T189-105	PPT
51.	5/8/24	2	Conceptual numericals	1/8/24	2		Chalk and talk
52.	6/8/24	2	Conceptual Numericals	5/8/24	2		Chalk and talk
53.	7/8/24	3	Tutorial - Stoichiometry of microbial growth and product formation	6/8/24	2		Questioning based teaching
			Conceptual Numericals	7/8/24	3		Chalk and talk

### Continuous Comprehensive Evaluation


Sl.no.	CCE Component	Submission due date
1	Assignment	18/6/24
2	Online quiz	22/7/24

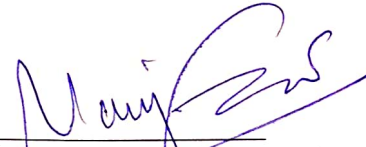
### Text books:

1. Introduction to Process calculations by KA. Gavhane
2. Bioprocess Engineering by Shuler & Kargi

### Reference books:

1. Bioprocess Engineering Principles by Pauline Doran
2. Stoichiometry by Bhatt & Vora

  
Faculty

  
**Dr. B.K. MANJUNATHA**  
HOD  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bangalore-560 024



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DEPARTMENT OF BIOTECHNOLOGY

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Lesson Plan

Faculty Name: Dr. Joseph Fernandes  
Academic Year: 2023-24 Even Sem  
SUB.CODE & Name: BBT456D/Biopesticides and Biofertilizers  
Year/Sem/Section: 2year/4 sem

**COURSE OBJECTIVES :** This course will enable the students to  
CLO1: Gain a comprehensive understanding of the use and significance of biopesticides and biofertilizers, and their applications for pest management and ecological sustainability  
CLO2: Learn various classes of biopesticides and biofertilizers, including microbial agents (e.g., bacteria, fungi, viruses), botanical extracts, and biochemicals, and understand their mechanisms of action against target pests  
CLO3: Learn ecological interactions between pests, natural enemies, and host plants, the importance of biofertilizers in enhancing soil fertility and promoting plant growth

**COURSE OUTCOMES:** At the completion of the course the student will be able to:  
CO1: Correlate the principles of Microbiology towards Biofertilizers and Bioinsecticides.  
CO2: Comprehend Pest-Plant interactions and apply the same in Agriculture.  
CO3: Understand strain selection and apply the same to scale up production of Biofertilizers and Bioinsecticides

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagog
	Date	Hr		Date	Hr		
1	26/4/24	1	Pathogens and Pests Management, Natural Enemies, Reduviids and Their Merits in Biological Control, Weaver Ants and Biocontrol of the Nuisance Pest <i>Luprops tristis</i> (Coleoptera: Tenebrionidae)	3/5/24	1	T2 1-23	Chalk and talk
2	03/5/24	1	Ground Beetles (Coleoptera: Carabidae): Their Potential as Bio-agents in Agroecosystems, Eco-friendly Control of Three Common Mosquito Larvae Species by Odonata Nymphs	17/5/24	1	T2 23-43	Chalk and talk
3	17/5/24	1	Spiders as Potential Eco-friendly Predators Against Pests	24/5/24	1	T2, 91-112	Chalk and talk
4	24/5/24	1	Types and importance of biofertilizers	31/5/24	1	T3 9-13	NPTTEL Videos
5	31/5/24	1	Biopesticides and bioagents in agriculture and organic farming system	7/6/24	1	T2 300-305	PPT
6	07/6/24	1	History of biofertilizers production Classification of biofertilizers microorganisms used in biofertilizers production	14/6/24	1	T2 306-319	PPT
7	14/6/24	1	Concept of Nitrogen fixation, Structure and characteristic biofertilizers - <i>Azotobacter</i> , <i>Bacillus</i>	21/6/24	1	T2 159-201	Chalk and talk
8	21/6/24	1	<i>Rhizobium</i> ; <i>Cynobacterial</i> biofertilizers - <i>Anabaena</i> , and fungal biofertilizers - <i>VAM</i> .	28/6/24	1	T3 15-26	Chalk and talk
9	28/6/24	1	Tutorial: Pathogens and Pest management and Biofertilizers	5/7/24	1		Chalk and talk
10	05/7/24	1	General account of microbes used as bioinsecticides and their advantages over synthetic pesticides, <i>Bacillus thuringiensis</i> , Mechanism of phosphate	5/7/24	1	T2 221-299	NPTTEL Videos



			solubilization and phosphate mobilization, K solubilization			T2 141-158	PPT
11	12/7/24	1	Botanicals: botanical pesticides, and biorationales. Botanicals and their uses. Plant Essential Oils and Pest Management	12/7/24	1		
12	19/7/24	1	Strain selection, sterilization, growth and fermentation, mass production of biofertilizers	19/7/24	1	T3 90-93	PPT
13	26/7/24	1	Storage, shelf life, quality control and marketing. Factors influencing the efficacy of biofertilizers/Biopesticides, FCO specifications and quality control of biofertilizers	26/7/24	1	T3 94-106	Chalk and talk
14	2/8/24	1	Application technology for seeds, seedlings, tubers, etc	2/8/24	1	T3 108-120	Chalk and talk

### Continuous Comprehensive Evaluation


Sl.no.	CCE Component	Submission due date
1	Assignment	18/6/24
2	Online quiz	22/7/24

### Text books:

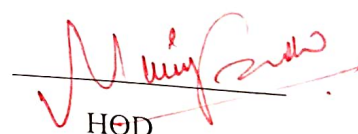
1. Biofertilizer and Biopesticide by Shalini Suri (Author) Aph Publishing Corporation 2011.
2. Biofertilizers and Biopesticides by BD Kaushik, D Kumar, M Shamim – 2019 CRC Press
3. Biofertilizers and biocontrol agents for organic farming by Reeta Khosla · 2017, published by Kartik Raj Kushvah

### Reference books:

1. Biofertilizers in Agriculture and Forestry, Subba Rao, N.S. Oxford and IBH. Publ. Co., New Delhi. 1993.



Faculty



HOD

**Dr. B.K. MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engg.  
Bengaluru-560 088



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DEPARTMENT OF BIOTECHNOLOGY ENGINEERING

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Lesson Plan

Faculty Name: Dr.B.K.Manjunath

Academic Year: 2023-24 Even Sem

SUB.CODE & Name: BBOK407/BIOLOGY FOR ENGINEERS

Year/Sem/Section: 2year/4 sem

**COURSE OBJECTIVES :** This course will enable the students to

CLO1: To familiarize the students with the basic biological concepts and their engineering applications.

CLO2: To enable the students with an understanding of biodesign principles to create novel devices and structures.

CLO3: To provide the students an appreciation of how biological systems can be re-designed as substitute products for natural systems.

CLO4: To motivate the students develop the interdisciplinary vision of biological engineering.

**COURSE OUTCOMES:** At the completion of the course the student will be able to:

CO1:Elucidate the basic biological concepts via relevant industrial applications and case studies.

CO2:Evaluate the principles of design and development, for exploring novel bioengineering projects.

CO3:Corroborate the concepts of biomimetics for specific requirements.

CO4:Think critically towards exploring innovative biobased solutions for socially relevant problems.

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
1.	22/4/24	4	The cell: the basic unit of life, Structure and functions of a cell	22/4	4	T1	PPT
2.	24/4/24	4	The Plant Cell and animal cell	24/4	4	T1	PPT
3.	25/4/24	4	Prokaryotic and Eukaryotic cell,	25/4	4	T1	PPT
4.	26/4/24	4	Stem cells and their application.	29/4	4	T1	PPT
5.	29/4/24	4	Biomolecules: Properties and functions of Carbohydrates,	02/5	4		
6.	2/5/24	4	Nucleic acids, proteins, lipids	3/5	4	T1	PPT
7.	3/5/24	4	Importance of special biomolecules; Enzymes (Classification (with one example each), Properties and functions), vitamins and hormones.	6/5	4	T1	PPT
8.	6/5/24	4	Tutorial -Biomolecules	8/5	4		NPTEL Videos
9.	8/5/24	4	Carbohydrates (cellulose-based water filters, as bioplastics)	8/5	4	R2	PPT
10.	9/5/24	4	PHA and PLA	9/5	4	R2	PPT
11.	13/5/24	4	Nucleic acids (DNA Vaccine for Rabies)	13/5	4	R2	PPT
12.	15/5/24	4	RNA vaccines for Covid19, Forensics – DNA fingerprinting	15/5	4	R2	PPT
13.	16/5/24	4	Proteins (Proteins as food – whey protein and meat analogs)	16/5	4	R2	PPT
14.	17/5/24	4	Plant based proteins,	17/5	4	R2	PPT
15.	20/5/24	4	lipids (biodiesel cleaning agents/detergents)	20/5	4	R2	PPT
16.	22/5/24	4	Enzymes (glucose-oxidase in biosensors, lignolytic enzyme in bio-bleaching).	22/5	4	R2	PPT



7	23/5/24	4	Tutorial-Cellulose based water filter, Proteins as food	24/5	4		NPTEL Videos
18	24/5/24	4	Brain as a CPU system (architecture, CNS and Peripheral Nervous System,	27/5	4	T2	PPT
19	27/5/24	4	Signal transmission, EEG, Robotic arms for prosthetics. Engineering solutions for Parkinson's disease)	29/5	4	T2	PPT
20	29/5/24	4	Eye as a Camera system (architecture of rod and cone cells, optical corrections, cataract, lens materials, bionic eye)	31/5	4	T2	PPT
21	30/5/24	4	Heart as a pump system (architecture, electrical signalling - ECG monitoring and heart related issues,	31/6	4	T2	PPT
22	31/5/24	4	reasons for blockages of blood vessels, design of stents, pace makers, defibrillators	5/6	4	T2	PPT
23	3/6/24	4	Lungs as purification system (architecture, gas exchange mechanisms,	7/6	4	R1	PPT
24	5/6/24	4	spirometry, abnormal lung physiology - COPD, Ventilators, Heart-lung machine).	13/6	4	R2	PPT
25	6/6/24	4	Kidney as a filtration system (architecture, mechanism of filtration, CKD, dialysis systems).	14/6	4	T1	PPT
26	7/6/24	4	Tutorial-Eye, Kidney	14/6	4	R1	NPTEL Videos
27	13/6/24	4	Echolocation (ultrasonography, sonars)	19/6	4	T2	PPT
28	14/6/24	4	Photosynthesis (photovoltaic cells, bionic leaf).	21/6	4	T2	PPT
29	19/6/24	4	Bird flying (GPS and aircrafts),	25/6	4	T1	PPT
30	20/6/24	4	Lotus leaf effect (Super hydrophobic and self-cleaning surfaces),	28/6	4	T1	PPT
31	21/6/24	4	Plant burrs (Velcro), Shark skin (Friction reducing swim suits).	1/7	4	R1	PPT
32	24/6/24	4	Kingfisher beak (Bullet train).	2/7	4	T2	PPT
33	26/6/24	4	Human Blood substitutes - hemoglobin-based oxygen carriers (HBOCs)	3/7	4	R1	PPT
34	27/6/24	4	perfluorocarbons (PFCs).	4/7	4	T1	PPT
35	28/6/24	4	Tutorial-Echolocation, Bird flying	5/7	4	T1	NPTEL Videos
36	1/7/24	4	Muscular and Skeletal Systems as scaffolds (architecture, mechanisms, bioengineering solutions for muscular dystrophy and osteoporosis)	8/7	4	T2	PPT
37	3/7/24	4	scaffolds and tissue engineering	10/7	4	T2	PPT
38	4/7/24	4	Bioprinting techniques and materials	11/7	4	T2	PPT
39	5/7/24	4	3D printing of ear	13/7	4	T2	PPT
40	8/7/24	4	3D printing of bone and skin	15/7	4	T2	PPT
41	10/7/24	4	3D printed foods	18/7	4	T1	PPT
42	11/7/24	4	Electrical tongue and electrical nose in food science,	19/7	4	R1	PPT
43	12/7/24	4	DNA origami and Biocomputing	22/7	4	R2	PPT
44	15/7/24	4	Bioimaging and Artificial Intelligence for disease diagnosis	22/7	4	T2	PPT
45	18/7/24	4	Self healing Bio concrete	25/7	4	R1	PPT
46	19/7/24	4	Self healing Bio concrete based on bacillus spores, calcification, biomineralization processes	26/7	4	R1	PPT
47	22/7/24	4	Bioremediation and Biomining via microbial surface adsorption	27/7	4	T2	PPT
48	24/7/24	4	Bioremediation and Biomining via microbial surface adsorption (removal of heavy metals like Lead,	2/8	4	T2	PPT

			Cadmium, Mercury, Arsenic).				
49	25/7/24	4	Tutorial --Self-healing bio-concrete, Electrical Tongue	2/8	4		NPTEL Videos

### Continuous Comprehensive Evaluation

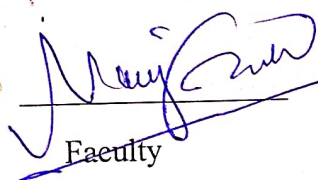
Sl.no.	CCE Component	Submission due date
1	Assignment	
2	Online quiz	

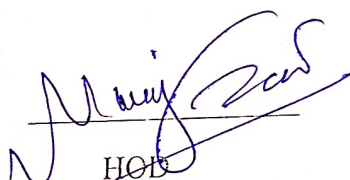
### Text books:

1. Biology for Engineers, Arthur T. Johnson, CRC Press, Taylor and Francis, 2011
2. Biology for Engineers, Thyagarajan S., Selvamurugan N., Rajesh M.P., Nazeer R.A., Thilagaraj W., Barathi S., and Jaganthan M.K., Tata McGraw-Hill, New Delhi, 2012.

### Reference books:

1. Biology for Engineers, Rajendra Singh C and Rathnakar Rao N, N Publishing, Bengaluru, 2023
2. Biology for Engineers, Sohini Singh and Tanu Allen, Vayu Education of India, New Delhi, 2014.

  
Faculty

  
HOD  
**Dr. B.K. MANJUNATHA**  
Professor & Head  
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The Oxford College of Engineering  
Bengaluru-560 068.





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Lesson Plan

Faculty Name: Dr. Joseph Fernandes

Academic Year: 2023-24 Even Sem

SUB.CODE & Name: BBT456D/Biopesticides and Biofertilizers

Year/Sem/Section: 2year/4 sem

- COURSE OBJECTIVES :** This course will enable the students to
- CLO1: Gain a comprehensive understanding of the use and significance of biopesticides and biofertilizers, and their applications for pest management and ecological sustainability
  - CLO2: Learn various classes of biopesticides and biofertilizers, including microbial agents (e.g., bacteria, fungi, viruses), botanical extracts, and biochemicals, and understand their mechanisms of action against target pests
  - CLO3: Learn ecological interactions between pests, natural enemies, and host plants, the importance of biofertilizers in enhancing soil fertility and promoting plant growth

- COURSE OUTCOMES:** At the completion of the course the student will be able to:
- CO1: Correlate the principles of Microbiology towards Biofertilizers and Bioinsecticides.
  - CO2: Comprehend Pest-Plant interactions and apply the same in Agriculture.
  - CO3: Understand strain selection and apply the same to scale up production of Biofertilizers and Bioinsecticides

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagog
	Date	Hr		Date	Hr		
	26/4/24	1	Pathogens and Pests Management, Natural Enemies, Reduviids and Their Merits in Biological Control, Weaver Ants and Biocontrol of the Nuisance Pest <i>Luprops tristis</i> (Coleoptera: Tenebrionidae)	26/4/24		T2 1-23	Chalk an talk
	03/5/24	1	Ground Beetles (Coleoptera: Carabidae): Their Potential as Bio-agents in Agroecosystems, Eco-friendly Control of Three Common Mosquito Larvae Species by Odonata Nymphs	03/5/24		T2 23-43	Chalk an talk
	17/5/24	1	Spiders as Potential Eco-friendly Predators Against Pests	17/5/24		T2 ,91-112	Chalk an talk
	24/5/24	1	Types and importance of biofertilizers	24/5/24		T3 9-13	NPTEL Videos
	31/5/24	1	Biopesticides and bioagents in agriculture and organic farming system	31/5/24		T2 300-305	PPT
	07/6/24	1	History of biofertilizers production Classification of biofertilizers microorganisms used in biofertilizers production	07/6/24		T2 306-319	PPT
	14/6/24	1	Concept of Nitrogen fixation, Structure and characteristic biofertilizers - <i>Azotobacter</i> , <i>Bacillus</i>	14/6/24		T2 159-201	Chalk an talk
	21/6/24	1	<i>Rhizobium</i> ; <i>Cynobacterial biofertilizers</i> - <i>Anabaena</i> , and <i>fungal biofertilizers</i> - <i>VAM</i> .	21/6/24		T3 15-26	Chalk an talk
	28/6/24	1	Tutorial: Pathogens and Pest management and Biofertilizers	28/6/24			Chalk an talk
	05/7/24	1	General account of microbes used as bioinsecticides and their advantages over synthetic pesticides, <i>Bacillus thuringiensis</i> , Mechanism of phosphate	05/7/24		T2 221-299	NPTEL Videos



			solubilization and phosphate mobilization, K solubilization	12/7/24	T2 141-158	PPT
12/7/24	1		Botanicals: botanical pesticides, and biorationales. Botanicals and their uses. Plant Essential Oils and Pest Management	19/7/24	T3 90-93	PPT
19/7/24	1		Strain selection, sterilization, growth and fermentation, mass production of biofertilizers	26/7/24	T3 94-106	Chalk and talk
26/7/24	1		Storage, shelf life, quality control and marketing. Factors influencing the efficacy of biofertilizers/Biopesticides, FCO specifications and quality control of biofertilizers	2/8/24	T3 108-120	Chalk and talk
2/8/24	1		Application technology for seeds, seedlings, tubers, etc			

#### Continuous Comprehensive Evaluation

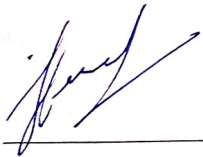
Sl.no.	CCE Component	Submission due date
1	Assignment	18/6/24
2	Online quiz	22/7/24

#### Text books:

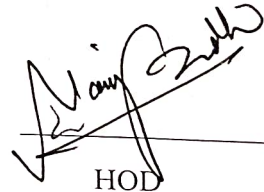
1. Biofertilizer and Biopesticide by Shalini Suri (Author) Aph Publishing Corporation 2011.
2. Biofertilizers and Biopesticides by BD Kaushik, D Kumar, M Shamim – 2019 CRC Press
3. Biofertilizers and biocontrol agents for organic farming by Reeta Khosla · 2017, published by Kartik Raj Kushvah

#### Reference books:

1. Biofertilizers in Agriculture and Forestry, Subba Rao, N.S. Oxford and IBH. Publ. Co., New Delhi. 1993.



Faculty



HOD

**Dr. B.K. MANJUNATHA**  
 Professor & Head  
 Department of Biotechnology  
 The Oxford College of Engineering  
 Bengaluru-560 068.



Children's Education Society ®  
**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF BIOTECHNOLOGY**  
 (Approved by AICTE, New Delhi, Accredited by NAAC, New Delhi & Affiliated to VTU, Belgaum)

**Subject code:** UHV 49  
**Subject title:** UNIVERSAL HUMAN VALUES  
**Semester:** IV  
**Faculty name:** Dr.Nair Sreecha Chandran

**Lesson plan**

**Date:** 02/09/24  
**Course/branch:** Biotechnology  
**Academic year:** 2023 - 24

**COURSE OUTCOMES**

After completion of this course, students will be able to:

- CO1: Understand and analyse the essentials of human values and skills, self exploration, happiness and prosperity.
- CO2: Evaluate coexistence of the "I" with the body.
- CO3: Identify and evaluate the role of harmony in family, society and universal order.
- CO4: Understand and associate the holistic perception of harmony at all levels of existence.
- CO5: Develop appropriate technologies and management patterns to create harmony in professional and personal lives

S.no.	Planned		Topic	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
1	22/04/24	1	Introduction to Value Education	22/04	1	T3/R1	Chalk and board
2	29/04/24	2	Introduction to Value Education	29/04	2	T3/R1	Chalk and board
3	06/05/24	2	Harmony in the Human Being	06/05	2	T3/R1	Chalk and board
4	13/05/24	1	Harmony in the Human Being	13/05	1	T3/R1	Chalk and board
5	20/05/24	1	Harmony in the Human Being	20/05	1	T3/R1	Chalk and board
6	27/05/24		Harmony in the Family and Society	27/05	1	T3/R1	Chalk and board
7	3/06/24		Harmony in the Family and Society	3/06	2	T3/R1	Chalk and board
8	24/06/24	1	Harmony in the Family and Society	24/06	1	T3/R1	Chalk and board
9	01/07/24	2	Harmony in the Nature/Existence	01/07	2	T3/R1	Chalk and board
10	08/07/24	1	Harmony in the Nature/Existence	08/07	1	T3/R1	Chalk and board
11	15/07/24	1	Harmony in the Nature/Existence	15/07	1	T3/R1	Chalk and board

12	22/07/24	2	Implications of the Holistic Understanding	22/07	2	T3/R1	Chalk and board
13	5/08/24	2	Implications of the Holistic Understanding	5/08	2	T3/R1	Chalk and board

R. Nair  
Faculty

Dr. B.K. HODINJINATHA  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.





Lesson Plan

Faculty Name: Dr. Manjunath. P

Academic Year: 2023-24 Even Sem

SUB.CODE & Name: BBT401/MOLECULAR BIOLOGY & GENETIC ENGINEERING

Year/Sem/Section: 2year/4 sem

**COURSE OBJECTIVES:** This course will enable the students to

CLO1: To acquire the fundamentals of molecular biology and genetic engineering principles.

CLO2: To understand the protocols of isolation of Nucleic acids and their analysis.

CLO3: To develop a conceptual application of gene libraries and various interactions.

CLO4: To learn the strategies for gene manipulation, editing technologies and its application

**COURSE OUTCOMES:** At the completion of the course the student will be able to:

1. Understand the basic concepts of genetic engineering for augmentation of traits.
2. Apply and comprehend the principles of gene manipulation, expression and interaction of genes and proteins.
3. Evaluate the screening and interaction studies using classical/conventional and high through put methods.
4. Design the strategies for gene cloning and gene editing.

S.	Planned		Topics to be covered	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
1	22/4/24	1	Central dogma of molecular biology	22/4/24		R3	Chalk and talk
2	23/4/24	4	Replication of DNA in Prokaryotic cell-Initiation and Regulation	23/4/24		R2, R3	Chalk and talk
3	24/4/24	1	Replication of DNA in Prokaryotic cell-Elongation and termination	24/4/24		R2, R3	Chalk and talk
4	25/4/24	3	Replication of DNA in Eukaryotic cell-Initiation and Regulation	25/4/24		R2, R3	Chalk and talk
5	29/4/24	1	Replication of DNA in Eukaryotic cell-Elongation and Termination	29/4/24		R2, R3	Chalk and talk
6	30/4/24	4	DNA damage, and repair: Base excision repair	30/4/24		R2, R3	Chalk and talk
7	2/5/24	1	Mismatch excision repair, photo-reactivation, nucleotide excision, and SoS repair	2/5/24		R2, R3	Chalk and talk
8	6/5/24	3	Tutorial-Replication and DNA damage repair	6/5/24			NPTTEL Videos
9	7/5/24	1	Transcription in the prokaryotic cell: Initiation and elongation	7/5/24		R2, R3	Chalk and talk
10	8/5/24	4	Transcription in the prokaryotic cell: termination and processing of mRNA.	8/5/24		R2, R3	Chalk and talk
11	9/5/24	1	Transcription in the eukaryotic cell: Initiation and elongation.	9/5/24		R2, R3	Chalk and talk
12	13/5/24	3	Transcription in the eukaryotic cell: termination and processing of mRNA.	13/5/24		R2, R3	Chalk and talk
13	14/5/24	1	Tutorial- Transcription in the prokaryotic and eukaryotic cell	14/5/24			NPTTEL Videos
14	15/5/24	4	Translation in the prokaryotic cell: Initiation, elongation	15/5/24		R2, R3	Chalk and talk

38	4/7/24	4	Blotting techniques (Southern, Northern and Western), Radioactive and non-radioactive labelling of nucleic acids	4/7/24	R1, R4	Chalk and talk
39	8/7/24	1	Methods of nucleic acid detection; Polymerase chain and requirements, types of PCR, applications.	8/7/24	R1, R4	Chalk and talk
40	9/7/24	3	Blotting techniques (Southern, Northern and Western), Radioactive and non-radioactive labelling of nucleic acids	9/7/24	R1, R4	Flipped Class rooms
41	10/7/24	1	Tutorials-Gene transfer techniques	10/7/24	R1, R4	PPT
42	11/7/24	4	Genome-Editing Technologies: Types, Principles and Applications	11/7/24	R1, R4	PPT
43	15/7/24	1	Engineering microbes for the production of antibiotics, enzymes, insulin and monoclonal antibodies.	15/7/24	R1, R4	PPT
44	16/7/24	3	Engineering microbes for the production of antibiotic monoclonal antibodies.	16/7/24	R1, R4	PPT
45	18/7/24	1	Engineering microbes for the production of antibiotic monoclonal antibodies.	18/7/24	R1, R4	Flipped Class rooms
46	22/7/24	4	Transgenic technology for plant and animal improvement	22/7/24	R1, R4	PPT
47	23/7/24	1	Over expression and Knock out/ knock down studies, RNAi	23/7/24	R1, R4	PPT
48	24/7/24	3	Over expression and Knock out/ knock down studies, RNAi	24/7/24	R1, R4	PPT
49	25/7/24	1	Bio pharming- Animals as bioreactors for recombinant proteins	25/7/24	R1, R4	PPT
50	1/8/24	4	Bio pharming- Plants as bioreactors for recombinant proteins	1/8/24	R1, R4	Chalk and talk
51	5/8/24	1	Genome-Editing Technologies: Types, Principles and Applications	5/8/24	R1, R4	Chalk and talk
52	6/8/24	3	CRISPR- associated protein – Cas 9	6/8/24	R1, R4	Questioning based teaching
53	7/8/24	1	Tutorial-applications of genetic engineering	7/8/24		Chalk and talk

### Continuous Comprehensive Evaluation

Sl.no.	CCE Component	Submission due date
1	Assignment	18/6/24
2	Online quiz	22/7/24

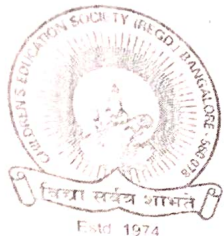
### Reference books:

1. Gene Cloning and DNA Analysis – An Introduction, T.A. Brown, Wiley-Blackwell Science, 7th edition, 2018.
2. From Genes to Genomes, Concepts and applications of DNA Technology. Jeremy W. Dale and MV Schantz. 2nd edition, 2018.
3. Lewin's genes XII Burlington, Massachusetts: Krebs, Jocelyn E., Goldstein, Elliott S., Kilpatrick, Stephen T., Jones & Bartlett Learning, 2018.
4. Molecular Biotechnology – Principles and applications of recombinant DNA, B.R. Glick, J.J. Pasternak and C.L Patten; ASM Press; 6th edn; 2017.

Faculty

IIOD





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1<sup>st</sup> Phase JP Nagar, Bengaluru - 560 078

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## THE OXFORD COLLEGE OF BIOTECHNOLOGY

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☎ 080-61754601-602, Fax 080-25730551 E-mail: engprincipal@theoxford.edu Web: www.theoxfordengg.org

### DEPARTMENT OF BIOTECHNOLOGY LESSON PLAN

Faculty Name: Dr. NAIR SREECHA CHANDRAN

Academic Year: 2023-24 EVEN

SUB.CODE & Name: 21CV654/ CONSERVATION OF NATURAL RESOURCES

Year/Sem/Section: III/VI/B

**COURSE OBJECTIVES** This course will enable the students to

**CLO1.** Learn types of land forms, soil conservation and sustainable land use planning.

**CLO2.** Apprehend water resources, types, distribution, planning and conservation. Water pollution and types of uses.

**CLO3.** Know the types of minerals and rocks.

**CLO4.** Know the atmospheric composition of air, pollution and effects on human beings, animals and plants. Air pollution control.

**CLO5.** Apprehend basics of biodiversity and ecosystems

### **COURSE OUTCOMES:**

CO1	Apprehend various components of land as a natural resource and land use planning.
CO2	Know availability and demand for water resources as applied to India.
CO3	Analyse the components of air as resource and its pollution.
CO4	Discuss biodiversity & its role in ecosystem functioning.
CO5	Critically appreciate the environmental concerns of today.

	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	30/04/24	1	Introduction	30/04/24	1	T3 R1	Chalk and board PP
2.	2/05/24	2	Land as a resource, types of lands	2/05/24	2	T3 R1	Chalk and board
3.	6/05/24	1	conservation of land forms,	6/05/24	1	T3	Chalk



							R1	and board
4.	7/05/24	2	deforestation, effect of land use changes.	7/05/24	2		T3 R1	Chalk and board, PP I
5.	8/05/24	5	Soil health, ecological and economic importance of soil.	8/05/24	5		T3 R1	Chalk and board, PP I
6.	9/05/24	2	impact of soil degradation on agriculture and food security	9/05/24	2		T3 R1	Chalk and board, PP I
7.	10/05/24	1	need for soil conservation, sustainable land use planning	10/05/24	1		T3 R2	Chalk and board, PP I
8.	16/05/24	2	Water: Global water resources, Indian water resources.	16/05/24	2		T1 R4	Chalk and board, PP I
9.	17/05/24	5	Resources system planning, Water use sectors- domestic, industrial, agriculture	17/05/24	5		T1 R4	Chalk and board, PP I
10.	21/05/24	2	Water deficit and water surplus basins in India.	21/05/24	2		T2 R4	Chalk and board, PP I
11.	22/05/24	1	equitable distribution, Inter-basin water transfers, Interlinking of rivers – Himalayan component,	22/05/24	1		T2 R4	Chalk and board, PP I
12.	23/05/24	2	peninsular component, issues involved: Ground water, its potential in India,	23/05/24	2		T4 R4	Chalk and board, PP I
13.	24/05/24	5	conjunctive use, recharge of ground water.	24/05/24	5		T4 R4	Chalk and board, PP I
14.	26/05/24	2	Contamination of ground water, sea water ingress, problems and solutions	26/05/24	2		T4 R4	Chalk and board, PP I
15.	28/05/24	1	Contamination of ground water, sea water ingress, problems and solutions	28/05/24	1		T4 R4	Chalk and board, PP I
16.	29/05/24	2	Air: Introduction,	29/05/24	2		T5 R3	Chalk and board, PP I
17.	29/05/24	5	composition, sources and classification of air	29/05/24	5		T5 R3	Chalk and board, PP I
18.	30/05/24	2	pollutants, National Ambient Air quality standards (NAAQS).	30/05/24	2		T5 R3	Chalk and board, PP I
19.	31/05/24	2	Air quality index, effects of air pollution on human health	31/05/24	2		T5 R3	Chalk and board, PP I
20.	4/06/24	1	Economic effects of air pollution	4/06/24	1		T5 R3	Chalk and board, PP I
21.	5/06/24	1	Control of air pollution by equipment, smoke and its control	5/06/24	1		T5 R3	Chalk and board, PP I

22.	6/06/24	2	Ozone depletion –impacts, photochemical changes	6/06/24	2	15 R3	Chalk and board, PP
23.	7/06/24	5	Biodiversity: Introduction.	7/06/24	5	16 R6	Chalk and board, PP
24.	8/06/24	2	Flora and Fauna.	8/06/24	2	16 R6	Chalk and board, PP
25.	11/06/24	1	Importance of biodiversity	11/06/24	1	16 R6	Chalk and board, PP
26.	12/06/24	2	Economic values-medical plants, drugs, fisheries biogeochemical cycling.	12/06/24	2	16 R6	Chalk and board, PP
27.	13/06/24	5	Threat to biodiversity.	13/06/24	5	16 R6	Chalk and board, PP
28.	14/06/24	2	natural & anthropogenic disturbance, habitat loss	14/06/24	2	16 R6	Chalk and board, PP
29.	18/06/24	2	Conservation of biodiversity, National parks, wild life sanctuaries, zoological gardens, gene banks, pollen culture.	18/06/24	2	16 R2	Chalk and board, PP
30.	19/06/24	5	ecological restoration, social forestry.	19/06/24	5	16 R6	Chalk and board, PP
31.	20/06/24	1	Ecosystem: Definition, Types: forest, grass land, marine, desert, wetlands, estuarine, lotic, lentic	20/06/24	1	16 R6	Chalk and board, PP
32.	21/06/24	2	Ecosystem: Definition, Types: forest, grass land, marine, desert, wetlands, estuarine, lotic, lentic.	21/06/24	2	16 R6	Chalk and board, PP
33.	22/06/24	5	Abiotic & biotic components of ecosystem	22/06/24	5	16 R6	Chalk and board, PP
34.	25/06/24	2	Global warming, concept.	25/06/24	2	16 R6	Chalk and board, PP
35.	26/06/24	1	indicators, factor and effects	26/06/24	1	16 R6	Chalk and board, PP
36.	27/06/24	1	Global climate change-indicators, health impacts.	27/06/24	1	16 R6	Chalk and board, PP
37.	28/06/24	2	effect on biodiversity	28/06/24	2	16 R6	Chalk and board, PP
38.	29/06/24	5	Introduction to global efforts in conservation of biodiversity.	29/06/24	5	16 R6	Chalk and board, PP
39.	2/07/24	2	EIA regulations in India, status of EIA in India.	2/07/24	2	16 R6	Chalk and board, PP

**Text Books: Books**

1. Modi, P.N., "Irrigation Water Resources and Water Power Engineering". Standard Book House. New Delhi. 10th Edition 2019.
2. Raghunath, H.M., "Groundwater" ,3rd Edition, New Age International Publishers, New Delhi, 2007.
3. Krishnan, M.S., "Geology of India & Burma". CBS publishers, New Delhi, 2017.
4. P.Jaya Rami Reddy, "A Textbook of Hydrology", University Science Press. New Delhi, 2011.
5. M N Rao and H V N Rao, "Air pollution", McGraw Hill Publications 2017.
6. Krishnamurthy K.V., "An advanced textbook of Biodiversity- principle & practices." Oxford and IBH publications Co.Pvt ltd, New Delhi. 2004.

**Reference Book:**

1. Odum, E.P., "Fundamentals of Ecology". W.B sounders, Philadelphia, USA, 1971
2. Singh J.S, Singh S.P & Gupta, S.R., "Ecology, environment and resource conservation", Anamaya publications, 2006.
3. Edmond A. Mathez & Jason E.Smerdon, "Climate Change: The science of Global warming and our energy future", Columbia University Press, 2009.
4. National Council of Applied Economic Research, "Economic Impact of Interlinking of Rivers Program", Revised Final Report, April 2008.  
5 <http://nwda.gov.in/content>.
6. Madhav Gadgil, "Biodiversity and Indias degraded lands", Indian Academy of Sciences, Volume 22-  
No

  
Faculty

  
HOD

Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.





Lesson Plan

Faculty Name: Dr. Manjunath. P

Academic Year: 2023-24 Even Sem

SUB.CODE & Name: 21BT61/Biobusiness Management and Entrepreneurship

Year/Sem/Section: 3year/6 sem

**COURSE OBJECTIVES:** This course will enable the students to

CLO1: To make the students learn about the principles of Biobusiness management.

CLO2: To enable the students understand the concepts of IPR, Bioethics, Biosafety and Regulations.

CLO3: To motivate the students explore various entrepreneurial opportunities.

**COURSE OUTCOMES:** At the completion of the course the student will be able to:

1. Understand the importance of Bio-business and Entrepreneurial opportunities.
2. Know the importance of bioethics, biosafety and IPR in Business.
3. Plan a project with a work plan, budget and schedule.
4. Exploit the opportunities under start-up schemes.

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
	29/4/24	3	Introduction to bio-business	30/4/24	1	T1, T2, R1, R2	Chalk and talk
	30/4/24	1	Introduction to bio-business-From the Indian context	30/4/24	4	T1, T2, R1, R2	Chalk and talk
	3/5/24	4	SWOT analysis of biobusiness	3/5/24	4	T1, T2, R1, R2	Chalk and talk
	6/5/24	4	Ownership	6/5/24	4	T1, T2, R1, R2	Chalk and talk
	7/5/24	3	Development of Entrepreneurship.	7/5/24	3	T1, T2, R1, R2	Chalk and talk
	8/5/24	1	Stages in entrepreneurial process	8/5/24	1	T1, T2, R1, R2	Chalk and talk
	13/5/24	4	Role of entrepreneurs in Economic Development; Entrepreneurship in India	13/5/24	4	T1, T2, R1, R2	Chalk and talk
	14/5/24	4	Entrepreneurship its barriers	14/5/24	4	T1, T2, R1, R2	Chalk and talk
	15/5/24	3	Small scale industries: Definition;Characteristics; Need and rationale	15/5/24	3	T1, T2, R1, R2	Chalk and talk
	17/5/24	1	Small scale industries: Objectives; Scope; Market Feasibility Study	17/5/24	1	T1, T2, R1, R2	NPTTEL Videos
	20/5/24	4	Technical Feasibility Study; Financial Feasibility Study & Social Feasibility Study	20/5/24	4	T1, T2, R1, R2	Chalk and talk
	21/5/24	4	Global biobusiness and industry future trends.	21/5/24	4	T1, T2, R1, R2	Chalk and talk
	22/5/24	3	Business opportunity, Essential requirement	22/5/24	3	T1, T2, R1, R2	Chalk and talk
	24/5/24	1	marketing, strategies, schemes, challenges and scope-with case study on Plant cell and tissue culture technique	24/5/24	1	T1, T2, R1, R2	Chalk and talk
	27/5/24	4	Polyhouse culture Herbal bulk drug production	27/5/24	4	T1, T2, R1, R2	Chalk and talk
	28/5/24	4				T1, T2, R1, R2	Chalk and talk

			Nutraceuticals, value added herbal products	26/5/24	4	R2	talk
29/5/24	3		Bioethanol production using Agriwaste, Algal source.	29/5/24	8	T1, T2, R1, R2	Chalk and talk
31/5/24	1		Integration of system biology for agricultural applications	31/5/24	1	T1, T2, R1, R2	Chalk and talk
7/6/24	4		Biosensor development in Agrimanagement	7/6/24	4	T1, T2, R1, R2	Chalk and talk
10/6/24	4		Business opportunity, Essential requirement, marketing strategies, schemes, challenges and scope with case study Pollution monitoring and Bioremediation for Industrial pollutants, Pesticides, Herbicides etc.	10/6/24	3	T1, T2, R1, R2	Questioning based teaching
11/6/24	3		Integrated compost production microbe enriched compost. Bio pesticide/insecticide production.	12/6/24	1	T1, T2, R1, R2	Chalk and talk
12/6/24	1		Fermented products-probiotic and prebiotics. Stem cell production, stem cell bank, contract research.	14/6/24	4	T1, T2, R1, R2	Chalk and talk
14/6/24	4		Production of monoclonal/polyclonal antibodies, Single cell protein and secondary metabolite production. Contact research in microbial genomics.	19/6/24	3	T1, T2, R1, R2	Chalk and talk
18/6/24	4		Building Biotech business challenges in Indian context-biotech partners (BICEPS, BIRAC, DBT, Incubation centers.Etc.), operational biotechparks in India.	21/6/24	4	T1, T2, R1, R2	Chalk and talk
19/6/24	3		Indian Company act for Biobusiness-schemes and subsidies. Meaning of Project; Project Identification; Project Selection; Project Report; Need and Significance of Report; Contents; Formulation; Guidelines by Planning Commission for Project report; Network Analysis; Errors of Project Report; Project Appraisal.	25/6/24	4	T1, T2, R1, R2	Chalk and talk
21/6/24	1		Identification of business opportunities: Market Feasibility Study; Technical Feasibility Study; Financial Feasibility Study & Social Feasibility Study.	26/6/24	3	T1, T2, R1, R2	Chalk and talk
24/6/24	4		Patent expiry and Entrepreneurship opportunity, Principles of Technology leasing, licensing and transfer, Startup schemes in Indian government, Business incubation support schemes, Successful start-ups case study.	27/6/24	5	T1, T2, R1, R2	Chalk and talk
25/6/24	4		Regulatory affairs in Bio business-regulatory bodies and their regulations (ex.FDA, EU, DSIR, AYUSH, FSSAI etc.,)	27/6/24	6	T1, T2, R1, R2	Chalk and talk
26/6/24	3		Public education of the process of biotechnology involved in generating new forms of life for informed decision-making.	27/6/24	7	T1, T2, R1, R2	Chalk and talk
28/6/24	1		Ethical concerns of biotechnology research and innovation	28/6/24	1	T1, T2, R1, R2	NPTEL Videos
1/7/24	4		Interference with nature fear of unknown, unequal distribution of risks	8/7/24	3	T1, T2, R1, R2	Chalk and talk
2/7/24	4		Rational vs. subjective perceptions of risks and	9/7/24	1	T1, T2, R1, R2	Chalk and talk



8/7/24	3	benefits Relationship between risk, hazard, exposure and safeguards	10/7/24	4	T1, T2, R1, R2	Chalk and talk
9/7/24	1	Biosafety concerns at the level of individuals, institutions, society, region, country and the world.	11/7/24	5	T1, T2, R1, R2	Chalk and talk
10/7/24	4	The Cartagena protocol on biosafety. Biosafety management	11/7/24	6	T1, T2, R1, R2	Chalk and talk
12/7/24	4	Indian Company act for Biobusiness-schemes and subsidies. Meaning of P2, R1, R2. Need and Significance of Project Identification; Project Selection; Project Report; Contents; Formulation; Guidelines by Planning Commission for Project report; Network Analysis; Errors of Project Report; Project Appraisal.	11/7/24	7	T2, R1, R2	Chalk and talk
15/7/24	3	Regulatory affairs in Bio business-regulatory bodies and their regulatory bodies (ex. FDA, EU, DSIR, AYUSH, FSSAI etc.)	12/7/24	4	T1, T2, R1, R2	Chalk and talk
16/7/24	1	Patent expiry and Entrepreneurship opportunity.	15/7/24	3	T1, T2, R1, R2	Chalk and talk
19/7/24	4	Principles of Technology leasing, licensing and transfer	16/7/24	1	T1, T2, R1, R2	Flipped Class rooms
22/7/24	4	Startup schemes in Indian government, Business incubation support schemes, Successful start-ups case study.	19/7/24	4	T1, T2, R1, R2	PPT
23/7/24	4	Building Biotech business challenges in Indian context-biotech partners (BICEPS, BIRAC, DBT, Incubation centers. Etc.), operational biotech parks in India.	23/7/24	4	T1, T2, R1, R2	PPT
24/7/24	3	Building Biotech business challenges in Indian context-biotech partners (BICEPS, BIRAC, DBT, Incubation centers. Etc.), operational biotech parks in India.	24/7/24	3	T1, T2, R1, R2	PPT
29/7/24	1	Building Biotech business challenges in Indian context-biotech partners (BICEPS, BIRAC, DBT, Incubation centers. Etc.), operational biotech parks in India.	29/7/24	1	T1, T2, R1, R2	PPT
30/7/24	4	Building Biotech business challenges in Indian context-biotech partners (BICEPS, BIRAC, DBT, Incubation centers. Etc.), operational biotech parks in India.	30/7/24	4	T1, T2, R1, R2	PPT

Continuous Comprehensive Evaluation		Submission due date
Sl.no.	CCE Component	18/6/24
1	Assignment	22/7/24
2	Online quiz	

- Text books:**
- Principles of Management by P.C. Tripathi, P.N. Reddy. Tata McGraw Hill Fifth Edition, 2012.
  - Entrepreneurship Development by S. S. Khanka. S. Chand & Co Publishing, 2006.
  - Bioethics & Biosafety by R Rallapalli & Geetha Bali. APH Publication, 2007. Bioethics & Biosafety by Sateesh M K, IK Publishers, 2008.
  - Management Fundamentals - Concepts, Application, Skill Development by Robers Lusier Cengage Learning, 1996.

- Reference books:**
- Intellectual Property Rights in the WTO and developing country by Watal Jayashree, Oxford University Press, 2001.
  - Practical Approach to IPR by Rachana Singh Puri, I K Intl. Ltd. 2009.

*Dr. Manjunath P*  
*Dr. Manjunath P*

*Dr. B.K Manjunatha*  
**Dr. B.K MANJUNATHA**  
 Professor & Head  
 Department of Biotechnology  
 The Oxford College of Engineering  
 Bengaluru-560 068.





Children's Education Society ®  
 THE OXFORD COLLEGE OF ENGINEERING  
 DEPARTMENT OF BIOTECHNOLOGY

(Approved by AICTE, New Delhi, Accredited by NAAC & NBA, New Delhi & Affiliated to VTU, Belgaum)

Lesson Plan

Faculty Name: Dr.K.Valarmathy

Academic Year: 2023-24 Even Sem

SUB.CODE & Name: 21BT62/Bioprocess Principles Control & Automation

Year/Sem/Section: 3year/6 sem

COURSE OBJECTIVES : This course will enable the students to

CLO1: To Understand the basics of process dynamics, principles and instrumentation

CLO2: To Study various types of input functions and its response

CLO3: To Study the different types of controllers and their design stability aspects.

COURSE OUTCOMES: At the completion of the course the student will be able to:

CO1: Elaborate the basics of process principles, dynamics, and instrumentation

CO2: Apply various types of input functions and study its response.

CO3: Perform studies on different types of controllers for their design and stability aspects.

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
1.	29/4/24	4	Instrumentation principles, Introduction to flow and pressure	29/4/24	4	Internet notes	PPT
2.	2/5/24	4	Temperature and liquid level measurement	2/5/24	4	Internet notes	PPT
3.	3/5/24	3	Measurement of important physicochemical and biochemical parameters	3/5/24	3	T3(227-228)	PPT
4.	6/5/24	4	Methods of online and offline biomass estimation	13/5/24	3	T4(670-674)	PPT
5.	8/5/24	1	Flow injection analysis for measurement of substrates,	13/5/24	4	T4(682-684)	PPT
6.	9/5/24	3	Flow injection analysis for measurement of products and other metabolites	15/5/24	2	T4(682-684)	PPT
7.	13/5/24	4	Dynamics and control of bioreactors and sterilizers	16/5/24	4	T3(227-228)	PPT
8.	20/5/24	1	On line data analysis state and parameter estimation techniques	20/5/24	4	Internet notes	PPT
9.	22/5/24	4	Process Characteristics, Laplace transforms	22/5/24	4	T1(49)	Chalk and talk
10.	23/5/24	3	First order systems, mercury in glass thermometer,	23/5/24	3	T1(71-80)	Chalk and talk
11.	27/5/24	4	Liquid level in tank, Mixing Process, CSTR with first order reaction	27/5/24	4	T1(71-80) T1(64-70)	Chalk and talk
12.	29/5/24	1	response of first order system for step input	29/5/24	1	T1(71-80)	Chalk and talk
13.	30/5/24	4	response of first order system Impulse and sinusoidal response and problems	30/5/24	4	T1(71-80)	Chalk and talk
14.	31/5/24	3	Interacting system	3/6/24	3	T1(87-89)	Chalk and talk
15.	6/6/24	4	Non-interacting systems	6/6/24	4	T1(87-89)	Chalk and talk
16.	7/6/24	3	Dynamic response to step input-interacting tank system	7/6/24	3	T1(87-89)	Chalk and talk
17.	10/6/24	4	Dynamic response to step input-non interacting tank system	10/6/24	4	T1(87-89)	Chalk and talk
18.	12/6/24	1	Conceptual numerical	12/6/24	1	Self-notes	Chalk and talk
19.	13/6/24	4	Tutorial-Interacting & non interacting tank system	13/6/24	4	T1(90-111)	NPTEL Videos

20.	14/6/24	3	Second order systems with transfer functions	14/6/24	3	T1(90-111)	Chalk and talk
21.	19/6/24	1	Second order systems -Spring damper	19/6/24	1	T1(90-111)	Chalk and talk
22.	20/6/24	4	Second order systems-control valve	20/6/24	4	T1(90-111)	Chalk and talk
23.	21/6/24	3	Second order systems-U tube manometer	21/6/24	3	T1(90-111)	Chalk and talk
24.	24/6/24	4	Response of second order system to step input	24/6/24	4	T1(90-111)	Chalk and talk
25.	26/6/24	1	Response of second order system to impulse input	26/6/24	2	T1(90-111)	Chalk and talk
26.	27/6/24	4	Response of second order system to sinusoidal input	27/6/24	4	T1(90-111)	Chalk and talk
27.	28/6/24	3	Overdamped, Underdamped and critically damped condition ,Transportation lag	28/6/24	3		Chalk and talk
28.	1/7/24	4	Numericals	1/7/24	4	T1(303-318)	Questioning based teaching
29.	8/7/24	4	Tutorial-u tube manometer	8/7/24	4	T1(303-318)	NPTTEL Videos
30.	10/7/24	1	Actuators, positioners, Valve body,	10/7/24	1	T1(111-132)	Chalk and talk
31.	11/7/24	4	Valve plugs, Characteristics of final control elements	11/7/24	4		Chalk and talk
32.	12/7/24	3	Controllers -Two position control	12/7/24	3	T1(111-132)	Chalk and talk
33.	15/7/24	4	proportional control, derivative control ,Integral control	15/7/24	4	T1(111-132)	Chalk and talk
34.	18/7/24	4	PI,PD & PID controllers	18/7/24	4	T1(111-132)	Chalk and talk
35.	19/7/24	3	Block diagram of servo problems	19/7/24	3	T1(111-132)	Chalk and talk
36.	22/7/24	4	Block diagram of regulatory problems	22/7/24	4	T1(111-132)	Chalk and talk
37.	24/7/24	1	Conceptual Numericals	24/7/24	1		Chalk and talk
38.	29/7/24	4	Conceptual Numericals	29/7/24	1		Chalk and talk
39.	31/7/24	1	Tutorials- Conceptual Numericals	31/7/24	1	T1(201-240)	Flipped Class rooms
40.	1/8/24	4	Concepts of stability, stability criteria	1/8/24	4	T1(201-240)	Chalk and talk
41.	2/8/24	3	Routh test	2/8/24	3	T1(201-240)	Chalk and talk
42.	5/8/24	4	Root locus	5/8/24	4	T1(201-240)	Chalk and talk
43.	7/8/24	1	Introduction to frequency response	7/8/24	1	T1(201-240)	Chalk and talk
44.	8/8/24	4	Qualitative discussion about Bode criteria	8/8/24	4		Chalk and talk
45.	9/8/24	3	Qualitative discussion about Nyquist criteria	9/8/24	3	T1(201-240)	Chalk and talk

Continuous Comprehensive Evaluation



Sl.no.	CCE Component	Submission due date
1	Assignment 1	30/5/24
2	Assignmnet 2	1/7/24
2	Online quiz	22/7/24

**Text books:**

1. Process systems analysis & control-Donald R Coughnowr
2. Chemical Process control-George
3. Principles of fermentation technology-P.F.Stanburry

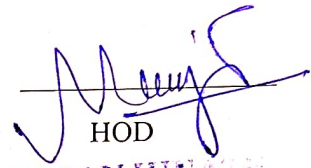
Bioprocess Engineering-Bailey & Ollis

**Reference books:**

1. Bioprocess Engineering Principles by Pauline Doran

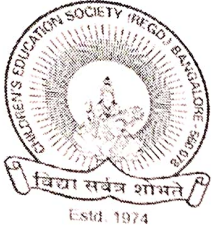


Faculty



HOD

**Dr. B.K. MANJUNATH**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.



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## **THE OXFORD COLLEGE OF ENGINEERING**

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF BIOTECHNOLOGY

#### LESSON PLAN

**Faculty Name:** P.Tamizharasi

**Academic Year:** 2023-24 Even Sem

**SUB.CODE & Name:** 21BT63/ENZYME TECHNOLOGY

**Year/Sem/Section:** 3 Year/6 Sem

**COURSE OBJECTIVES** This course will enable the students to

CLO1: To understand the classification, catalytic actions and diverse applications of enzymes.

CLO2: To understand the techniques and protocols related to purification, activity, immobilization and engineering of enzymes.

CLO3: To understand the kinetics of enzyme catalyzed reactions.

#### **COURSE OUTCOMES:**

CO1	Classify and identify the enzymes based on the biochemical reaction catalyzed by them
CO2	Compare enzymes and catalyst, and explain the mechanism of enzyme catalysis.
CO3	Recognize & Interpret the importance of enzymes in medicine
CO4	Explain the methods involved in study of enzyme kinetics, standardization and optimization of enzyme catalyzed reactions
CO5	Summarize the applications of enzymes in medicine and industry

S. No	Planned		Topics to be covered	Execution		Books Referred	Pedagogy
	Date	Hr		Date	Hr		
1.							
2.	30/4/24	4	Introduction to enzymes	30/4/24	4	T1	PPT
3.	2/5/24	2	Classification, Sources, Strategies of purification of enzymes	2/5/24	2	T1	PPT
4.	3/5/24	1	Molecular weight determination	3/5/24	1	T1	PPT

5.	7/5/24	4	Mechanism of enzyme catalysis (Acid base, Covalent, Metal ion catalysis, Substrate strain & entropy effects)	7/5/24	4	T3	PPT
6.	8/5/24	2	Criteria of purity and characterization of enzyme	8/5/24	2	T3	PPT
7.	9/5/24	2	Advantages of Biocatalyst vs Chemical catalysts	9/5/24	2	T3	PPT
8.	11/5/24	1	Isolated Enzymes versus whole cell systems	10/5/24	4	T1	PPT
9.	14/5/24	4	Application of enzymes in different industry	10/5/24	4	R2	PPT
10.	15/5/24	2	Enzyme and isoenzyme measurement methods with two examples (fixed incubation and kinetic methods)	16/5/24	2	R2	PPT
11.	16/5/24	2	Enzymes in immunoassay techniques,	17/5/24	1	R2	PPT
12.	17/5/24	1	Methods for investigating the kinetics of Enzyme catalyzed reactions	17/5/24	1	R2	PPT
13.	21/5/24	4	Initial velocity studies (MM and LB plots)	21/5/24	4	R2	PPT
14.	22/5/24	2	Rapid reaction techniques	22/5/24	2	R2	PPT
15.	23/5/24	2	Standardization and optimization methods	23/5/24	2	R2	PPT
16.	23/5/24	1	Stability of enzymes (pH, Temperature)	23/5/24	1	R2	PPT
17.	24/5/24	1	Mechanism of action of coenzymes (NAD/NADP, FAD/FADH <sub>2</sub> , PLP, Coenzyme A, TPP, Biotin)	24/5/24	1	R2	PPT
18.	25/5/24	2	Tutorial-Cellulose based water filter, Proteins as food	24/5/24	2	T3	PPT
19.	28/5/24	4	Allosteric Enzymes.	28/5/24	4	T2	PPT
20.	29/5/24	2	Techniques of enzyme immobilization	29/5/24	2	T2	PPT
21.	30/5/24	2	Kinetics of immobilized enzymes	30/5/24	2	T2	PPT
22.	31/5/24	1	Effect of solute	31/5/24	1	T2	PPT
23.	6/6/24	2	Partition & diffusion on the kinetics of immobilized enzymes	4/6/24	2	T2	PPT
24.	7/6/24	1	Design and configuration of immobilized enzyme reactors	7/6/24	1	R1	PPT



25.	11/6/24	4	Applications of immobilized enzyme technology,	11/6/24	4	R2	PPT
26.	12/6/24	2	Economic argument for immobilization	12/6/24	2	T1	PPT
27.	13/6/24	2	Biocatalysts from extremophiles microorganisms (extremozymes) and their applications	13/6/24	2	R1	PPT
28.	14/6/24	1	The design and construction of novel enzymes	14/6/24	1	T2	PPT
29.	18/6/24	4	artificial enzymes,	18/6/24	4	T2	PPT
30.	19/6/24	2	Host Guest Complexation chemistry and enzyme design using steroid templates	19/6/24	2	T1	PPT
31.	20/6/24	2	Activators and Inhibitors	20/6/24	2	T1	PPT
32.	21/6/24	1	In vitro Biotransformation of drugs (hydroxylation of Steroids)	21/6/24	1	R1	PPT
33.	22/6/24	2	Therapeutic enzymes -	22/6/24	2	R1	PPT
34.	25/6/24	4	Acetylcholinesterase and pseudocholesterase	25/6/24	4	T2	PPT
35.	26/6/24	2	Angiotensin converting enzyme (ACE) and Inhibitors	26/6/24	2	T1	PPT
36.	27/6/24	2	HMGCoA reductase inhibitors	27/6/24	2	T1	PPT
37.	28/6/24	1	glucose-6-phosphate dehydrogenase (GPD)	28/6/24	1	T2	PPT
38.	29/6/24	1	Immuno-reactive trypsinogen (IRT) and Amylase isoenzymes	29/6/24	1	T2	PPT
39.	2/7/24	4	Importance of enzymes in diagnostics	2/7/24	4	T2	PPT
40.	9/7/24	4	Enzyme pattern in diseases like Myocardial infarctions (SGOT, SGPT & LDH).	9/7/24	4	T2	PPT
41.	10/7/24	2	Isoenzymes (CK, LD, ALP)	10/7/24	2	T1	PPT
42.	11/7/24	2	Use of isozymes as markers in cancer and other diseases.	11/7/24	2	T2	PPT
43.	12/7/24	1	Enzymes used in detergents	12/7/24	1	R1	PPT
44.	13/7/24	4	Use of proteases in food	13/7/24	4	R2	PPT



45.	16/7/24	4	Leather and wool industries	16/7/24	4	T2	PPT
46.	18/7/24	2	Methods involved in production of glucose syrup from starch (using starch hydrolyzing enzymes)	18/7/24	2	R1	PPT
47.	19/7/24	1	Production of maltose and sucrose	19/7/24	1	R1	PPT
48.	23/7/24	4	Glucose from cellulose	23/7/24	4	T2	PPT
49.	24/7/24	2	Uses of lactase in dairy industry	24/7/24	2	T2	PPT
50.	30/7/24	2	Glucose oxidase and catalase in food industry	30/7/24	2	R2	PPT

### Continuous Comprehensive Evaluation

Sl. No.	CCE Component	Submission due date
1	Assignment 1	25/05/2024
2	Assignment 2	29/06/2024
3	Seminar	24/07/2024

### Text books:

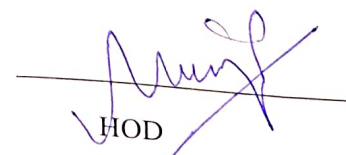
1. Enzyme Technology by Martin Chaplin and Christopher Bucke, Cambridge University Press, 1990.
2. Enzymes by Dixon and Webb, Academic Press 2nd Edition, 1964.
3. Principles of Enzymology for technological Applications by Butter worth Heinemann. Oxford University Press, 1993.

### Reference books:

1. Fundamentals of Enzymology by Prices and Stevens. Oxford Press. Third Edition, 1999.
2. Enzymes in Industry: Production and Applications by W.Gerhartz. Wiley-VCH Publishers 3<sup>rd</sup> Edition, 2007.



Faculty

  
HOD

**Dr. B.K. MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bangaluru-560 068.



**Lesson plan**

**Subject code:** 18BT822

**Date:** 06/03/2024

**Subject title:** Industrial Microbiology

**Course/Branch:** Biotechnology

**Semester:** VIII

**Academic year:** 2023-24 Even Semester

**Faculty name:** P.Tamizharasi

**Course Objectives:**

1. To understand the details of microbial techniques for growth, cultivation and characterization of microorganisms with industrial importance.
2. To appreciate the recent developments in the area of medical microbiology, environmental microbiology, industrial microbiology, etc.

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	The era of the discovery of Microbes	2	16/02/24	T1(3-6)	PPT and Board
	2	Scope of Industrial Microbiology and fermentation technology	4	16/02/24	T1(7-12)	PPT and Board
	3	Growth of Industrial Fermentations	1	17/02/24	T1(14-32)	PPT and Board
	4	Study of industrially important micro-organisms	3	17/02/24	T1(42-55)	PPT and Board
	5	Study of industrially important micro-organisms	2	23/02/24		PPT and Board
	6	Preservation of industrially important micro-organisms	4	23/02/24	T2(124-132)	PPT and Board
	7	Criteria for selection and strategies for strain improvement	1	24/02/24	T2(134-144)	PPT and Board
	8	Criteria for selection and strategies for strain improvement	3	24/02/24	T2(146-164)	PPT and Board
	9	Maintenance and containment of recombinant organisms	2	01/03/24	T2(164-182)	PPT and Board
	10	Maintenance and containment of recombinant organisms	4	01/03/24	T2(184-210)	PPT and Board
2	1	Characteristics of an Ideal Production Media	1	01/03/24	T1(31-46)	PPT and Board
	2	Raw materials for production of media	3	08/03/24	T1(31-46)	PPT and Board
	3	Batch culture: growth kinetics	2	08/03/24	T2(207-209)	PPT and Board
	4	Growth kinetics: effect of environment: temperature	4	08/03/24	T1(51-59)	PPT and Board
	5	Growth kinetics: pH and nutrient concentration	1	08/03/24		PPT and Board
	6	Monitoring microbial growth in culture: cell number, direct and indirect methods	3	09/03/24	T2(207-209)	PPT and Board
	7	Continuous culture: concepts of Newtonian and Non-Newtonian fluid	2	09/03/24	T2(207-209)	PPT and Board
	8	Continuous culture: plastic fluids, apparent viscosities	4	09/03/24	T2(310-320)	PPT and Board
	9	Anti-foam agents	1	09/03/24	T2(325-334)	PPT and Board
3	1	Basic features, design & components – Typical fermenter	3	15/03/24	E-Source	PPT and Board
	2	Sterilization of fermenter, medium, air	2	15/03/24	E-Source	PPT and Board



		supply	4	15/03/24	E-Source	PPT and Bo
	3	Aseptic inoculation and sampling methods	1	16/03/24	E-Source	PPT and Bo
	4	scale up of fermentation process (parameters used in scale up, problems associated)	3	16/03/24	E-Source	PPT and Bo
	5	Merits & demerits	2	16/03/24	E-Source	PPT and Bo
	6	Fermentation media: Media formulation strategies	4	22/03/24	Self notes	PPT and Bo
	7	Sources of carbon, nitrogen, vitamins and minerals	1	22/03/24	Self notes	PPT and Bo
	8	Role of buffers, precursors, inhibitors and inducers	3	22/03/24	Self notes	PPT and Bo
	9	Specialized bioreactors (Photobioreactors, Membrane, Fluidized bed, Tubular and Packed bed bioreactor)	2	23/03/24	T3(184-185)	PPT and Bo
	10	Specialized bioreactors (Photobioreactors, Membrane, Fluidized bed, Tubular and Packed bed bioreactor)	4	23/03/24	T3(186-188)	PPT and Bo
4	1	Introduction and History of Assay	1	23/03/24	T3 (195-200)	PPT and Bo
	2	Microbiological assay of: Vitamins	3	29/03/24	T3(189-192)	PPT and Bo
	3	Microbiological assay of: Amino Acids	2	29/03/24	T3(189-192)	PPT and Bo
	4	Microbiological assay of: Antibiotics, Trace elements	4	29/03/24	T3(195-194)	PPT and Bo
	5	Advantages and Disadvantages of Microbiological Assay	1	29/03/24	T3 (210-215)	PPT and Bo
	6	Estimation of growth in SSF	3	30/03/24	Self notes	PPT and Bo
	7	Comparison of SSF with SmF	2	30/03/24	T3(201-207)	PPT and Bo
	8	Factors influencing SSF	4	30/03/24	T3(201-207)	PPT and Bo
	8	Kinetics of SSF	1	30/03/24	T3(210-215)	PPT and Bo
	9	Design of fermenter in SSF	3	30/03/24		
5	10	Production of commercially important products by SSF	2	12/04/24	R1(383-386)	PPT and Bo
	1	Objectives and criteria of downstream processing	4	12/04/24	Self notes	PPT and Bo
	2	Foam separation, precipitation methods	1	13/04/24	R1 (168,394)	PPT and Bo
	3	Filtration and centrifugation	3	13/04/24	R1 (210-232)	PPT and Bo
	4	Cell disruption methods	2	13/04/24	R1 (108-119)	PPT and Bo
	5	Liquid extraction of the products	4	19/04/24	R1 (108-119)	PPT and Bo
	6	Membrane filtration	1	19/04/24	R1 (140-158)	PPT and Bo
	7	Chromatography; Drying devices	3	26/04/24	R1 (120-136)	PPT and Bo
	8	Crystallization of the product; Solvent recovery; Effluent treatment	2	26/04/24	R1 (120-136)	PPT and Bo
	9	Process economics	4	26/04/24	R1 (108-119)	PPT and Bo
	10	Objectives and criteria of downstream processing	1	03/04/24		
		Revision-module 1	3	03/04/24		
		Revision-module-2	2	04/04/24		PPT and Bo
		Revision-module-3	4	04/04/24		PPT and Bo
		Revision-module-4	1	10/04/24		PPT and Bo
		Revision-module-5				PPT and Bo

### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Industrial Antibiotic Production Process	R1

### Assignment topics

Sl.no.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	05/03/24
2	Assignment from module 2 & 3	02/04/24
3	Assignment from module 4 & 5	05/05/24

### Course Outcome (Course Skill Set)

1. Understand the strategies for selection, isolation, improvement and preservation of industrial important microorganisms
2. Define process of fermentation and its parameters
3. Understand the design of fermenters, types of fermenters, and media used for the fermentation process
4. Interpret the types fermentation and assay carried out for various commercially important product in fermentation industries
5. Describe the isolation and purification of product produced by the process of fermentation

### Text books:

1. Microbiology, Prescott, Harley, Klein
2. Basics of microbiology, Michael J Pelczar Jr Chan ECS, Noel R Krieg
3. Microbiology: Principles and Explorations, Jacquelyn G. Black

### Reference Books:

1. Industrial Microbiology Palynology and its applications, Samuel C Prescott, Cecil G Dun

*P. Jyoti*  
Faculty  
(P. Tamizharasi)

*Manjuna*  
HOD  
**Dr. B.K MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.





**Lesson plan**

Date: 13/11/2023  
 Course/branch: Biotechnology  
 Academic year: 2023-24 Odd Sem.

Subject code: BBT301  
 Subject title: Cell Biology & Genetics  
 Semester: III  
 Faculty name: Dr. Salma Kausar M.  
 Objective of course:

- To gain basic understanding of cellular processes, pathways and cytoskeletal organization.
- To be able to understand concepts of cell signaling
- To gain an understanding of classical genetics and apply the same to disorders.

Prerequisite: Basic knowledge of biology

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	<b>CYTOLOGY AND CYTOSKELETON</b> Prokaryotic and eukaryotic cell, Cell Architecture.	4	15.11.23	T1(1.1-1.35)	Chalk & Talk
	2	physio-chemical nature of plasma membrane and functions of cell organelle	2	20.11.23	T1(1.1-1.35)	Chalk & Talk
	3	nucleus, mitochondria, chloroplast, ribosomes, peroxisomes	1	21.11.23	T1(1.1-1.35)	Chalk & Talk
	4	Golgi bodies and endoplasmic reticulum. Cytoskeletal elements, Microtubules: structure & functions, shaping of the cells and	2	22.11.23	T1(1.1-1.35)	Chalk & Talk
	5	Mechanical support. Microfilaments: structure & functions.	4	24.11.23		Chalk & Talk
	6	Structure of intermediate filaments	2	27.11.23	T1(1.1-1.35)	PPT, Smartboard
	7	Cytoplasmic micro trabecular system (lattice).	1	28.11.23	T1(2.2-2.5)	PPT, Smartboard
	8	Covalent modifications of cytoskeletal proteins. Cytoskeletal architecture	2	29.11.23	T1-exercise	PPT, Smartboard
2	1	<b>CELL CYCLE AND CELL SIGNALLING:</b> Cell cycle studies; mitosis and meiosis. Cell Birth, lineage and death.	4	1.12.23	T1(3.1-4.6)	PPT, Smartboard
	2	Cellular senescence and ageing, Hayflick phenomenon	2	4.12.23	T1(3.1-4.6)	PPT, Smartboard
	3	Senescence in ageing and age-related disease, Apoptosis and Necrosis	1	5.12.23	T2(207-209)	PPT, Smartboard
	4	Cancer Cell Biology, Asymmetrical cell division, patterns of stem cell division	2	6.12.23	T1(5.1-5.59)	PPT, Smartboard
	5	Signalling molecules and cell surface, receptors; intracellular signal transduction; G protein coupled receptors	4	8.12.23	Self notes	PPT, Smartboard
	6	plant growth factors and hormones, Eukaryotic and Prokaryotic cell to cell signalling	2	11.12.23	T2(207-209)	PPT, Smartboard
	7	endocrine signalling, quorum sensing and intercellular signalling	1	12.12.23	T2(207-209)	Case study
	8	Signal peptides, biofilm formation	2	13.12.23	T1 & T2	Seminar, flipflop class
3	1	<b>MEMBRANE TRANSPORT:</b> Membrane transport, passive and active transport; transport into prokaryotic cells;	4	15.12.23	T1(7.1-7.2)	PPT, Smartboard
	2	Endomembrane System: Golgi, Lysosomes	2	18.12.23	T1(7.3-7.6)	PPT, Smartboard
	3	Vesicular Traffic, Secretion	1	19.12.23	T1(7.11-7.12)	PPT, Smartboard
	4	Endocytosis, exocytosis; entry of viruses and	2	20.12.23	T4 exercise	PPT, Smartboard



	toxins into cells					
5	Membrane trafficking: Translocation of secretory proteins across the ER membrane	4	22.12.23	T1(7.12-7.14)	Seminar interactiv	PPT, Smart
6	Protein modifications, folding and quality control in the ER	2	1.01.24	T1(4.17-4.1)		PPT, Smartbo
7	export and sorting of proteins to mitochondria	1	2.01.24	T1 exercise		PPT, Smartbo
8	chloroplast and peroxisomes.	2	3.01.24	Self notes		PPT, Smartbo
1	<b>GENETICS:</b> Nature of genetic material, Mendelian Laws of inheritance,	4	5.01.24	T3(184-185)		
2	monohybrid and dihybrid inheritance, law of segregation & independent assortment	2	8.01.24	T3(186-188)		PPT, Smartbo
3	Gene interactions, supplementary genes - Comb patterns in fowls	1	9.01.24	T3 exercise		PPT, Smartboa
4	Complementary genes - Flower color in sweet peas, Epistasis- Inhibitory and colored genes in fowls	2	10.01.24	T3(189-192)		PPT, case study
5	Identification of genetic material, classical experiments- Hershey & Chase, Avery, McLeod etc.,	4	12.01.24	T3(189-192)		PPT, case study
6	Multiple alleles and groups antigens. Numericals based on concepts. Chromosome, Centrosome, telomere	1	16.01.24	T3(195-194)		PPT, Smartboard
7	Chemical composition of chromatin, structural organization of nucleosomes	2	17.01.23	T3 exercise		PPT, Smartboard
8	heterochromatin. Polytene and lamp-brush chromosomes, human chromosomes	4	19.01.23	Self notes		PPT, Smartboard
1	<b>CHROMOSOMAL DISORDERS</b> Sex determination in plants, animals XX-XY, XX-XO, ZW-ZZ, ZO-ZZ types in animals.	2	22.01.24	T4(383-386)		PPT, Smartboard
2	Chromosomal disorders. Sex linked inheritance molecular diseases, hemoglobinopathies.	1	23.01.24	Self notes		PPT, case study
3	Disorders of coagulation, Colour blindness, hemophilia	2	24.01.24	T2(168,394)		PPT, Smartboard
4	Non-disjunction as a proof of chromosomal theory of inheritance, Linkage maps, crossing over. Chromosomal maps, interference coincidence.	4	05.02.24	T4 exercise		PPT, Smartboard
5	<b>POPULATION GENETICS:</b> Introduction, Gene frequency, and equilibrium estimation	2	06.02.24	T4(108-119)		PPT, Smartboard
6	changes in gene frequency, inbreeding and heterosis, genetic structure of population	1	07.01.24	T4(108-119)		PPT, Smartboard
7	speciation and evolution, prospects for the control of human evolution.	2	08.01.24	T4(110), T4(108-119)		PPT, Smartboard
8	Spontaneous and induced mutations, Eugenics. Pedigree analysis		13.01.24	T4(120-136)		PPT, Smartboard
	VTU question paper revision		14.01.24			
	VTU question paper revision		15.01.24			
	VTU question paper revision		19.01.24			



### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Age-related disease- Case study	Cell and molecular biology, EDPDe Robertis, EMF De Robertis, Lea & Febiger Intl. ed.1991

### Assignment topics

Sl.no.	Assignment topic	Submission due on
1	Biofilm formation example Mycobacterium tuberculosis MDSA	6/01/24
2	Cellular senescence and ageing advanced research – Case study	28/01/24

**Course Outcomes:** At the end of the course the student will be able to:

- Co-relate cellular structure-function relationship in the context of cell growth and death.
  - Apply the concepts of cell signalling to biofilm formation.
  - Apply the principles of Mendelian Genetics to understand gene interactions, multiple alleles and sex linked inheritance.
- Apply principles of Chromosome structure and gene frequencies in the context of inherited disorders and population genetics

### Text books:

1. The Cell – A Molecular Approach, Cooper & Hausman, ASM Press, 2004.
2. Cell and molecular biology, EDPDe Robertis, EMF De Robertis, Lea & Febiger Intl. ed.1991.
3. Molecular Biology of the Cell, B. Alberts, et al., Garland Science, 4th ed. 2002.

### Reference Books

1. Molecular Cell Biology Hardcover, James E. Darnell, Harvey Lodish, David Baltimore, 1999

  
Faculty

  
HOD

**Dr. B.K MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 066.



Lesson Plan

Subject code: 21BT32

Subject title: Unit Operations

Semester: III

Faculty name: Dr. Indulekha John

Course/branch: Biotechnology  
Academic year: 2023-24 (ODD)

Course Objectives:

- To know the fundamental concepts of fluid mechanics, heat and mass transfer.
- To understand the design concepts of fluid and particulate technology.
- To solve engineering problems related to fluid flow, heat and mass transfer.

Prerequisite: Basic knowledge of fluid mechanics, heat and mass transfer.

Module	Topic no.	Topics planned	Period	Date	Books referred & page no.	Pedagogy
1	1.	Fluid definition and classification of fluids, types of fluids, Rheological behaviour of fluids	4	31/10/23	T2 ( 1-5), R1( 1-3)	Chalk & Talk
	2.	Newton's Law of viscosity	2	03/11/23	T2 (10-14),	Chalk & Talk
	3.	Fluid statics-Pascal's law	3	03/11/23	T2 ( 23-24) T1(18-20)	Chalk & Talk
	4.	Hydrostatic equilibrium, Barometric equation and pressure measurement(problems)	4	05/11/23	T2 ( 24-34) T1( 42-47), T2 ( 14-16)	Chalk & Talk
	5.	Basic equations of fluid flow - Continuity equation, Euler's equation	4	07/11/23	T2 ( 14-16)I ( 1-3)	Chalk & Talk
	6.	Bernoulli equation; Types of flow - laminar and turbulent	1	08/11/23	T2I( 16-21)	Chalk & Talk
	7.	Reynolds experiment	2	10/11/23	T2 ( 79-82)	Chalk & Talk
	8.	Flow through circular and non-circular conduits -	4	14/11/23	T2 ( 23-24)	Chalk & Talk
	9.	Hagen Poiseuille equation (no derivation).	1	15/11/23	T1(18-20)	Chalk & Talk
	10.	Flow through stagnant fluids – theory of Settling and Sedimentation	2	17/11/23	T2 ( 24-34) T2 (101-106)	Chalk & Talk
	11.	Equipment (cyclones, thickeners)	3	18/11/23	T2 (108-109)	Chalk & Talk
	12.	Conceptual numericals.	1	19/11/23	Self notes	Chalk & Talk
	13.	Different types of flow measuring devices- Orifice meter with derivations	4	21/11/23	T2 (45-48), T2 (948-50)	PPT
	14.	Venturimeter with derivations	1	22/11/23	T2 (45-50)	Chalk & Talk
	15.	Rotameter with flow equation derivation	2	24/11/23	T2 (45-50)	Chalk & Talk
	16.	Flow measurements –. Pumps – types of pumps (Centrifugal & Reciprocating pumps)	3	25/11/23	T2 (50-53)	PPT
	17.	Energy calculations and characteristics of pumps	4	28/11/23	T2 (51-60) R4( 60-61)	Chalk & Talk
	18.	Tutorial, Size reduction–characteristics	1	29/11/23	T2 (54-60)	Chalk & Talk



2		of comminute products, sieve analysis	4	05/12/23	T2 ( 61-62)	Chalk & Talk
	19	Properties and handling of particulate solids – characterization of solid particles, average particle size		06/12/23	T2 ( 61-62)	Chalk & Talk
	20	Screen analysis	1	08/12/23	Self-notes	Chalk & Talk
	21	Conceptual numericals of differential and cumulative analysis	2			Chalk & Talk
	22	Size reduction, crushing laws, working principle of ball mill	3	09/12/23	T2 ( 62-66)	Chalk & Talk
	23	Filtration & types, filtration equipments (plate and frame, rotary drum).	4	12/12/23	T2 ( 66-69)	PPT
	24	Conceptual numericals.	1	13/12/23	Self-notes	Chalk & Talk
	24	Conceptual numericals.	2	15/12/23	T2 (188-190)	Chalk & Talk
3	25	Modes of heat transfer; Conduction – steady state heat conduction through unilayer and multilayer walls				
	26	Cylinders; Insulation	3	16/12/23	T2 (190-192)	Chalk & Talk
	27	Critical thickness of insulation.	2	17/12/23	T2 (193-197)	Chalk & Talk
	28	Convection- Forced and Natural convection, principles of heat transfer co-efficients	4	19/12/23	IV( 237)	Chalk & Talk
	29	log mean temperature difference,	1	20/12/23	T2 ( 197-202),	Chalk & Talk
	30	Individual and overall heat transfer co-efficients	2	22/12/23	T2 ( 197-202)	Chalk & Talk
	31	Tutorial, fouling factor	3	23/12/23	T2 ( 207-209) II( 216-217)	Chalk & Talk
	32	Condensation – film wise and drop wise (no derivation)	4	26/12/23	T2 (190-192)	Chalk & Talk
	33	Heat transfer equipments – double pipe heat exchanger	1	27/12/23	T2 ( 225-227)	PPT
	34	shell and tube heat exchanger (with working principle and construction with applications).	2	29/12/23	T2 ( 227-232) T2 ( 232-235)	PPT
	35	Numericals	3	30/12/23	T2 ( 227-234)	Chalk & Talk
	36	Diffusion-Fick's law of diffusion.	3	31/12/23	T2 ( 227-234)	Chalk & Talk
	37	Types of diffusion.	4	02/01/24	T2 ( 254-260)	Chalk & Talk
	38	Steady state molecular diffusion in fluids at rest and laminar flow (stagnant / unidirection and bi direction)	1	03/01/24	T2 ( 265-273)	Chalk & Talk
	4	39	Conceptual numerical	4	09/01/24	T2 ( 274-277)
40		molecular diffusion in fluids at rest and laminar flow	1	10/01/24	T2 ( 274-280)	Chalk & Talk
41		Measurement of diffusivity	2	12/01/24	T2 ( 274-280)	Chalk & Talk
42		Tutorial on diffusion	3	13/01/24	T2 ( 274-280)	Chalk & Talk
43		Mass transfer coefficients and their correlations	4	16/01/24	T2 ( 280-299)	Chalk & Talk
44		Mass transfer coefficients and their correlations	1	17/01/24	R1( 387-389) T2 ( 310-3230), T2 ( 324-343)	Chalk & Talk
45		Conceptual numerical	2	19/01/24	Self notes	Chalk & Talk
46		Basic concepts of Liquid-liquid extraction	3	20/01/24	T2 (381-382)	Chalk & Talk
47		Equilibrium, stage type extractors	4	23/01/24	T2 ( 60-62) T2 ( 62-64)	Chalk & Talk
						Chalk & Talk

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48	Belt extraction and basket extraction	1	24/01/24	T2 ( 402-405)	Chalk & Talk
49	Distillation	3	27/01/24	T2 ( 407-422)	Chalk & Talk
50	Tutorial on extraction	4	28/01/24	T2 ( 422-429)	Chalk & Talk
51	Methods of distillation	4	30/01/24	T2 ( 422-429)	Chalk & Talk
52	Distillation of binary mixtures using McCabe Thiele method	1	31/01/24	T2 ( 422-429)	Chalk & Talk
53	Drying- drying operations,	4	06/02/24	Self notes	PPT
54	Batch and continuous drying	1	07/02/24	Self notes	PPT
55	Conceptual numerical.	2	09/02/24	Self notes	Chalk & Talk
56	Revision	3	10/02/24	Self notes	Chalk & Talk
57	Revision	1	11/02/24	Self notes	Chalk & Talk

### Course Outcomes:

At the completion of the course the student will be able to:

- Describe the nature and properties of the fluids.
- Perform various flow measurements using different instruments.
- Explain the principles of various mechanical operations like size reductions, conveying equipment, sedimentation and mixing tanks.
- Illustrate the laws governing the heat and mass transfer operations.
- Analyse the construction details of heat and mass transfer equipment for specific requirement.

Sl. No.	Self-study Topics	Suggested Reference
i	Navier Stoke's equation of motion	Fluid Mechanics by K L Kumar, S Chand & Company Ltd, 2008

### Assignment Topics

Sl. No.	Assignment Topics	Submission due on
1	Numericals from module 1 & 2	15/11/23
2	Numericals from module 3	18/01/24

### Text books:

1. Unit operations in Chemical Engineering, Warren L. McCabe, Julian C. Smith & Peter Harriot, McGraw-Hill Education (India) Edition 2014.
2. Fluid Mechanics K L Kumar S Chand & Company Ltd 2008
3. Introduction to Chemical Engineering Badger W.I. and Banchero, J.T., Tata McGraw Hill New York 1997

### Reference books:

1. Principles of Unit Operations Alan S Foust, L.A. Wenzel, C.W. Clump, L. Maus, and L.B. Anderson John Wiley & Sons 2nd edition 2008
2. Unit Operations of Chemical Engineering, Vol I &II Chattopadhyaya Khanna Publishers, Delhi-6 1996
3. Heat Transfer J P Holman McGraw Hill International Ed.



Faculty



HOD

**Dr. B.K. MANJUNATHA**

Professor & Head

Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.





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**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF BIOTECHNOLOGY**  
 (Approved by AICTE, New Delhi, Accredited by NBA, NAAC, New Delhi & Affiliated to VTU, Belgaum)

Lesson plan

Date: 11/9/2023

Subject code: B BT 303

Subject title: Biochemistry + Lab

Semester: III

Faculty name: Ms. Ramya K

Course/branch: Biotechnology  
 Academic year: 2023-24 Odd Semester

Objective of course:

1. To get an overview of the main aspects of biochemistry by relating molecular interactions to their effects on the organism as a whole.
2. To understand the organization of macromolecules through a discussion of their hierarchical structure and study their assembly into complexes, responsible for specific biological processes.
3. To Comprehend the different metabolic pathways and their interconnections into tightly regulated networks y

Prerequisite: Chemistry

Unit	Topic no.	Topic	Per iod	Date	Books referred	Pedagogy
1	1	BASIC CONCEPTS: Types of chemical reactions,	1	15/11/23	T1,T2	PPT
	2	pH, Henderson Hesselbalch equation,	2	16/11/23	T1,T2	PPT
	3	buffers and their properties	3	20/11/23	T1,T2	PPT
	4	concentration of solutions. Stereo chemistry of carbon compounds.	3	21/11/23	T1,T2	PPT
	5	BIOMOLECULES: Classification, structure, properties and functions of Carbohydrates,	1	22/11/23	T1,T2	PPT
	6	Lipids	2	23/11/23	T1,T2	PPT
	7	Proteins	3	27/11/23	T1,T2	PPT
	8	Nucleic acids (in brief)	3	28/11/23	T1,T2	PPT
2	1	BIOENERGETICS: Introduction,	1	29/11/23	T1,T2	PPT
	2	energy flow cycle, thermodynamic laws.	2	4/12/23	T3,T4	PPT
	3	Standard free energy change-equilibrium constant.	3	5/12/23	T3,T4	PPT
	4	, High energy compounds ,structure and properties of ATP,	3	6/12/23	T3,T4	PPT
	5	biological oxidation - Electron transport chain, ATP synthesis.	1	9/12/23	T3,T4	PPT
	6	Oxidative phosphorylation. Energetics, energy balance sheet, oxidative stress.	3	18/12/23	T3,T4	PPT
	7	Photosystems and photophosphorylation (synthesis of ATP and NADPH),	3	19/12/23	T5,T4	PPT
	8	Inhibitors of oxidative phosphorylation,	1	20/12/23	T5,T4	PPT
3	1	METABOLISM OF CARBOHYDRATE: Glycolysis –metabolism.	2	21/12/23	T3.T2	PPT
	2	Aerobic and anaerobic pathway and regulation,	2	1/1/24	T3.T2	PPT
	3	TCA cycle,	3	2/1/24	T3.T2	PPT
	4	NADPH Cycle, Calvin Cycle,	3	3/1/24	T3.T2	PPT
	5	Glyoxylate cycle, Pentose Phosphate Pathway.	1	4/1/24	T3.T2	PPT

	6	Gluconeogenesis – regulation of gluconeogenesis.	2	8/1/24	T3.T2	PPT
	7	Glycogenesis and glycogenolysis, their regulation.	3	9/1/24	T3.T2	PPT
	8	Disorders of carbohydrate (lactose intolerance, galactosemia, diabetes)	3	10/1/24	T3.T2	PPT
4	1	METABOLISM OF LIPID: Digestion, Mobilization and transport of fats,	1	11/1/24	T3.T2	PPT
	2	Biosynthesis of palmitic acid	2	16/1/24	T3.T2	PPT
	3	biodegradation of triglycerides and fatty acids (beta oxidation).	3	17/1/24	T3.T2	PPT
	4	Physiology of lipids/lipoproteins and apolipoproteins.	3	18/1/24	T3.T2	PPT
	5	Disorders of Lipid metabolism- atherosclerosis,	1	22/1/24	T3.T2	PPT
	6	ketone bodies (acidosis-kesosis)	2	23/1/24	T3.T2	PPT
	7	Gaucher disease	3	24/1/24	T3.T2	PPT
	8	LDL-hypercholesterolemia	3	25/1/24	T3.T2	PPT
5	1	METABOLISM OF AMINO ACIDS & NUCLEIC ACIDS: Biosynthesis of essential amino acids: Lysine, Phenylalanine and Glutamine.	1	29/1/24	T3.T2	PPT
	2	Biodegradation of amino acids, deamination, transamination	2	30/1/24	T3.T2	PPT
	3	urea cycle	3	31/1/24	T3.T2	PPT
	4	Disorders of amino acid metabolism (phenylketonuria, alkaptonuria)	3	1/2/24	T3.T2	PPT
	5	tyrosinemia and maple syrup urine disease	1	2/2/24	T3.T2	PPT
	6	Biosynthesis, biodegradation, and regulation of Purines, pyrimidines	2	5/2/24	T3.T2	PPT
	7	Disorders of nucleic acid metabolism Gout, leshnyhn syndrome. hyper and hypo uricemia	3	6/2/24	T3.T2	PPT
	8	adenosine deaminase deficiency.	3	7/2/24	T3.T2	PPT
		Revision	1	8/2/24		
		Revision	2	9/2/24		
		Revision	3	16/2/24		
		Revision	3	19/2/24		

#### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Disorders of nucleic acid metabolism	.Lehninger Principles of Biochemistry, David L. Nelson, Michael M. Cox, 67h Edition, W.H. Freeman, 2017.

#### Assignment topics

Sl.no.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	19/12/23
2	Assignment from module 3 & 4	30/1/24

#### Course Outcomes:

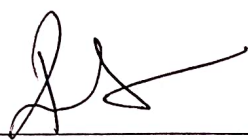
1. Explain the fundamentals of biologically important molecules such as structures, functions and interactions
2. Understand complex biochemical pathways within living cells and the associated metabolic disorders
3. Comprehend biochemical principles and apply them to biological systems/samples



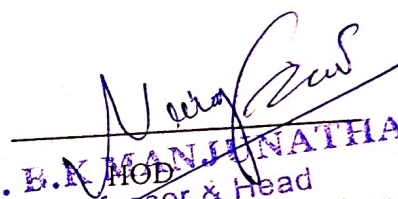
4. Perform basic biochemical experiments, analyse, interpret and present the data

**Text books:**

1. Principles of Biochemistry, Donald Voet, Judith G. Voet, Charlotte W. Pratt, 4th Edition, John Wiley & Sons, 2012.
2. Lehninger Principles of Biochemistry, David L. Nelson, Michael M. Cox, 6th Edition, W.H. Freeman, 2017.
3. Biochemistry, U Satyanarayana, 5th Edition Books & Allied Ltd., 2017.
4. Biochemistry, Denise Ferrier, Lippincott, Williams & Wilkins, 2017.
5. Harper's Illustrated Biochemistry by Victor W. Rodwell, David Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil, Thirty-First Edition (A & L LANGE SERIES), 2018.



Faculty



**DR. B.K. MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.



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Lesson plan

Date: 06/02/2024

Course/branch: Biotechnology  
 Academic year: 2023-24 Odd Semester

Subject code: BBT304

Subject title: Microbiology

Semester: III

Faculty Name: P.Tamizharasi

Objective of course:

1. To understand the fundamental energy sources, energy use, energy efficiency, and resulting environmental implications of various energy supplies.
2. To introduce various aspects of environmental pollution and its control.
3. To understand the causes and remedies related to social issues like global warming, ozone layer depletion, climate change etc.
4. To introduce various acts related to prevention and control of pollution of water and air, forest protection act, wild life protection act etc.

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
	1	Scope and History of Microbiology (Major Milestones)	1	15/11/23	T1(3-6)	PPT and Board
	2	Prokaryotes, Archaea and Eukaryotes	2	16/11/23	T1(7-12)	PPT and Board
	3	Microbial Diversity and Taxonomy	4	17/11/23	T1(14-32)	PPT and Board
	4	Classification, Characteristics and Reproduction of Bacteria	2	20/11/23	T1(42-55)	PPT and Board
	5	Classification, Characteristics and Reproduction of Viruses	1	21/11/23		PPT and Board
	6	Classification, Characteristics and Reproduction of Fungi	2	23/11/23	T2(124-132)	PPT and Board
	7	Classification, Characteristics and Reproduction of Protozoa	2	24/11/23	T2(134-144)	PPT and Board
	8	Classification, Characteristics and Reproduction of Algae	1	25/11/23	T2(146-164)	PPT and Board
	9	General Features of true Bacteria- Rickettsia, Mycoplasma and Chlamydia	4	27/11/23	T2(164-182)	PPT and Board
	10	Prions, Spirochetes	2	28/11/23	T2(184-210)	PPT and Board
	1	Bright-Field Microscopy	1	29/11/23	T1(3.1-4.6)	PPT and Board
	2	Dark-Field Microscopy	2	01/12/23	T1(3.1-4.6)	PPT and Board
	3	Phase-Contrast Microscopy	4	04/12/23	T2(207-209)	PPT and Board
	4	Acoustic Microscopy	1	05/12/23	T1(5.1-5.59)	PPT and Board
	5	Fluorescence Microscopy	2	06/12/23		PPT and Board
	6	Electron Microscopy (SEM, TEM)	4	07/12/23	T2(207-209)	PPT and Board
	7	Micrometry, Media: Types and Preparation	1	08/12/23	T2(207-209)	PPT and Board
	8	Pure Culture Techniques (Streak Plate, Spread Plate, Pour Plate)	2	11/12/23	T2(310-320)	PPT and Board
	9	Staining Techniques (Simple and Differential)	4	12/12/23	T2(325-334)	PPT and Board
3	1	Microbial Growth Phases	2	14/12/24	E-Source	PPT and Board
	2	Factors affecting the growth	4	19/12/24	E-Source	PPT and Board
	3	Growth Measurement and Enumeration	2	20/12/24	E-Source	PPT and Board
	4	Metabolism	1	23/12/24	E-Source	PPT and Board
	5	Primary and Secondary Metabolites with Exmaples	1	01/01/24	E-Source	PPT and Board



	6	Metabolic Pathways Important in microorganisms	2	03/01/24	E-Source	PPT a
	7	Repiration and Fermentation (EMP, HMP,ED, Phospho ketolase, Mixed acid,TCA)	4	05/01/24	E-Source	PPT a
	8	Control of growth(Sterilization and Disinfection Techniques)	2	08/01/24	Self notes	PPT a
4	1	Common Diseases caused by microbes	4	09/01/24	T3(184-185)	PPT a
	2	Common Diseases caused by viruses- Polio,H1N1,SARS	2	12/01/24	T3(186-188)	PPT a
	3	Common Diseases caused by viruses- Covid-19, HIV, Hepatitis	2	16/01/24	T3 (195-200)	PPT a
	4	Common Diseases caused by Bacteria- TB, Cholera, Typhoid	1	18/01/24	T3(189-192)	PPT a
	5	Common Diseases caused by Bacteria- Pneumonia, Plague, Diphtheria, E.Coli infections	2	19/01/24	T3(189-192)	PPT a
	6	Common Diseases caused by Protozoans- Malaria, Leishmaniasis, Amebiasis	4	22/01/24	T3(195-194)	PPT ar
	7	Common Types of Fungal Infections (ringworm,yeast infection)	2	24/01/24	T3 (210-215)	PPT ar
	8	Microbiome and gut health	2	25/01/24	Self notes	PPT ar
5	1	Aerobiology	4	29/01/24	T4(383-386)	PPT ar
	2	Air sampling techniques and commonly found atmospheric microbe profile	2	31/01/24	Self notes	PPT an
	3	Water sampling techniques	1	02/02/24	T2(168,394)	PPT an
	4	Microbiology of potable water and wastewater treatment	2	02/02/24	T4 exercise	PPT an
	5	Microbiology of soil: Soil fertility	4	05/02/24	T4(108-119)	PPT an
	6	Biofertilizers: VAM, Rhizobium and Azotobacter	2	07/02/24	T4(108-119)	PPT an
	7	Biogeochemical cycles	1	08/02/24	T4(110), T4(108-119)	PPT and
	8	Case studies	2	16/02/24	T4(120-136)	PPT and
		Revision-Module 1	2	19/02/24		PPT and
		Revision-Module-2	2	24/02/24		PPT and
		Revision-Module-3	1	27/02/24		PPT and
		Revision-Module-4	2	29/02/24		PPT and
		Revision-Module-5	4	01/03/24		PPT and

**Self-study topics (not included in syllabus)**

Sl.no.	Self-study topic	Suggested references
1	Microbial Pathogenecity and Virulence	T1

**Assignment topics**

Sl.no.	Assignment topic
1	Assignment from Module 1 & 2
2	Assignment from Module 3,4 & 5

**Course Outcomes:**

- CO1: Be able to classify microorganism along with their structural and functional roles  
CO2: Apply learning of microscopy and microbial techniques in identification and enumeration  
CO3: Identify microbes through use of appropriate culture, characterize them under given conditions and study the microbial growth along with its control  
CO4: Describe and relate the occurrence of microbes caused diseases.  
CO5: Explain the occurrence and role of general microflora of air, water and soil.

**Text books:**

1. General Microbiology: Roger Y Stanier, John L Ingraham, and Mark L Wheels Macmillan Press Ltd, V Edition (International Edition). 1999.
2. Microbiology Michael J Pelczar, J R Chan ECS, Noel R Krieg Tata McGraw-Hill Education Pvt. 2013.
3. Harley, Klein. Microbiology Prescott, McGraw Hill Seventh Edition. 1996.
4. Industrial Microbiology, Prescott and Dunn, CBS Pub. 4th Edition, 2004.

**Reference Books:**

1. Ananthanarayan and Paniker, Textbook of Microbiology. Orient Blackswan, 2006.

P. Jyoti  
Faculty

(P. Tamizharasi)

Dr. B.K Manjunatha  
HOD

**DR. B.K MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.





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**Lesson plan**

**Subject code:** BBT358A

**Subject title:** Biolab Management & Risk Assessment

**Semester:** III

**Faculty name:** P.Tamizharasi

**Date:** 06/02/2024

**Course/branch:** Biotechnology

**Academic year:** 2023-24 Odd Semester

**Objective of course:**

1. To enable the students to develop an understanding biolab management and risk and its assessment.
2. To enable the students to learn the methods to minimize and mitigate the risks at various steps of lab processes.
3. To enable the students to perform the risk-benefit analysis in biotechnological processes.

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	Essentials of Lab Management	1	16/11/23	T1(12-25)	PPT and Board
	2	Designing the lab, spacing, inventory organization and its management	1	23/11/23	T1(42-62)	PPT and Board
	3	Automation via use of technology, Documentation and Safety Requirements	1	23/11/23	T1(84-92)	PPT and Board
	4	Biosafety Levels, Planning experiments	1	29/11/23	T1(112-125)	PPT and Board
	5	Storage Space, Waste Generation and its disposal	1	29/11/23		PPT and Board
2	1	Definition and Meaning of Risk, Difference between risk and hazard	1	07/12/23	T2(8-18)	PPT and Board
	2	Probability of occurrence of risk	1	07/12/23	T2(34-46)	PPT and Board
	3	Risk Assessment, Risk Control, Risk Review	1	14/12/23	T2(57-59)	PPT and Board
	4	Risk Management Tools, HACCP	1	14/12/23	T2(71-79)	PPT and Board
	5	Risk Ranking and Filtering	1	14/12/23		PPT and Board
	7	HACCP	1	21/12/23	T2(207-209)	PPT and Board
	8	Risk Control, Risk Review	1	21/12/23	T2(310-320)	PPT and Board
3	1	Biosafety Meaning, Levels of Biosafety-BSL1, BSL2, BSL3, BSL4	1	4/01/24	E-Source	PPT and Board
	2	Applications of hazards involved for products derived out of Biotechnology	1	4/01/24	E-Source	PPT and Board
	3	International Protocols and Case Studies	1	11/01/24	E-Source	PPT and Board
4	1	Principles of Safety Assessment - for infectious organisms, agents	1	11/01/24	T3(184-185)	PPT and Board
	2	Microbes - Genetically altered/metabolically engineered transgenic plants	1	18/01/24	T3(186-188)	PPT and Board
	3	GMO/LMOs used in food, pharma, bioremediation	1	18/01/24	T3 (195-200)	PPT and Board
	4	Sequential steps in risk assessment, concepts of familiarity and substantial equivalence	1	25/01/24	T3(189-192)	PPT and Board
	5	Environmental Risk Assessment and food and feed safety assessment	1	25/01/24	T3(189-192)	PPT and Board
5	1	Risk assessment through omics approach	1	01/02/24	T3(383-386)	PPT and Board

	2	Ethical, Legal and social implications of health privacy and policy laws for mitigation	1	08/02/24	Self notes	PPT and Board
	3	Risk Characterization and development of analysis plan.	1	15/02/24	T2(168,394)	PPT and Board
		Revision-module 1	1	22/02/24		PPT and Board
		Revision-module-2	1	22/02/24		PPT and Board
		Revision-module-3	1	25/02/24		PPT and Board
		Revision-module-4	1	29/02/24		PPT and Board
		Revision-module-5	1	29/02/24		PPT and Board

**Self-study topics (not included in syllabus)**

Sl.No.	Self-study topic	Suggested references
1	OMICS Technology	T1

**Assignment topics**

Sl.No.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	10/11/23
2	Assignment from module 3,4 & 5	01/12/23

**Course Outcomes:**

CO1: Apply principles of biology to understand risk and its assessment.

CO2: Deduce methods to minimize and mitigate the risks.

CO3: Evaluate risk-benefit analysis of different genetic engineering interventions based upon case studies.

CO4: Correlate laws pertaining to biological risk to the sustainable use of GMOs in different applications.

**Text books:**

1. Biotechnology risk: Complete Self-Assessment Guide, by Gerardus Blokdyk, 2020
2. Laboratory Biorisk Management Biosafety and Biosecurity, Reynolds M. Salerno, Jennifer, Gaudio, 2015
3. Laboratory Biorisk Management Biosafety and Biosecurity, Reynolds M. Salerno, Jennifer, Gaudio, 2015

**Reference Books:**

1. Assessments of Genetically Modified Crops. Craig, W., Tepfer, M., Degrassi, G., & Ripandelli, D. Euphytica, 2008

P. Jothi  
Faculty  
(P. Tamizharasi)

Manjunatha  
HOD  
Dr. B.K. MANJUNATHA  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.





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**Lesson plan**

**Date:** 27/11/2023

**Course/branch:** Biotechnology

**Academic year:** 2022-23 Odd Semester

**Subject code:** 21 BT 51

**Subject title:** Biokinetics & Bio Reaction Engg

**Semester:** V

**Faculty name:** Dr. Valarmathy K

**Objective of course:**

- To discuss the different models of chemical reactions and how various factors such as temperature can affect reaction rate.
- To study the performance and distinguish between the different types of ideal and non-ideal reactors
- To determine the optimum pH, temperature and concentration of an enzyme's catalytic power, its substrate affinity and inhibitor role
- To comprehend the fundamentals of Microbial growth kinetics and its stoichiometry
- To describe medium requirements and medium formulation to get optimal bioprocesses model

**Prerequisite:** Stoichiometry and Material balance calculations Biochemical Reactions.

Sl. No.	Topic	Period	Date	Books referred	Pedagogy
1	1	3	2023-11-27	T1(1.1-1.35)	Chalk and Board
	2	1	2023-11-28	T1(1.1-1.35)	Chalk and Board
	3	3	2023-11-29	T1(1.1-1.35)	Chalk and Board
	4	3	2023-12-01	T1(1.1-1.35)	Chalk and Board
	5	3	2023-12-04		Chalk and Board
	6	1	2023-12-05	T1(1.1-1.35)	Chalk and Board
	7	3	2023-12-06	T1(2.2-2.5)	Chalk and Board
	8	3	2023-12-08	T1-exercise	Chalk and Board
	9	3	2023-12-11	T1-exercise	Chalk and Board
	10	1	2023-12-12	T1-exercise	Chalk and Board
2	1	3	2023-12-13	T1(3.1-4.6)	Chalk and Board
	2	3	2023-12-15	T1(3.1-4.6)	
	3	3	2023-12-18	T1(3.1-4.6)	Chalk and Board
	4	1	2023-12-19	T1(5.1-5.59)	Chalk and Board
	5	3	2023-12-20	T2(207-209)	Chalk and Board
	6	3	2023-12-22	T1(7.1-7.2), T1(7.3-7.6)	Chalk and Board
	7	3	2023-12-26	T1(7.11-7.12)	Chalk and Board
	8	1	2023-12-27	T1(4.17-4.1)	Chalk and Board

	9	Calculations of conversion for first order reactions	3	2024-01-01	T1 & T2 exercise	Chalk and Board
	10	Tanks in series & dispersion models	3	2024-01-02	T1 & T2 exercise	Chalk and Board
	11	Conceptual numerical	3	2024-01-03	T1 exercise	Chalk and Board
3	1	Enzyme active site, types of enzyme specificities	1	2024-01-05	T3(184-185)	Chalk and Board
	2	Enzyme kinetics, initial velocity studies	3	2024-01-08	T3(186-188)	Chalk and Board
	3	Formation of ES complex	3	2024-01-09	T3 exercise	Chalk and Board
	4	Derivation of michelis menton equation	3	2024-01-10	T3(189-192)	Chalk and Board
	5	Definition of Km & Vmax	1	2024-01-12	T3(189-192)	Chalk and Board
	6	Lineweaver-burk & Eadie-Hofstee plots	3	2024-01-15	T3(195-194)	Chalk and Board
	7	Units of enzyme activity, enzyme inhibition	3	2024-01-16	T3 exercise	Chalk and Board
	8	Competitive, uncompetitive & non competitive	3	2024-01-17	Self notes	Chalk and Board
	9	Allosteric & feedback regulations	1	2024-01-19	T3(201-207)	Chalk and Board
	10	Conceptual numerical	3	2024-01-22	T3(201-207)	Chalk and Board
4	1	Batch growth kinetics	3	2024-01-23		
	2	Elemental balance of biological conversion with and without extracellular product formation	3	2024-01-24	T1 & T2 exercise	Chalk and Board
	3	Degree of reduction	1	2024-01-26	T1 & T2 exercise	Chalk and Board
	4	Theoretical prediction of yield coefficients	3	2024-02-02	T2(207-209)	Chalk and Board
	5	Factors affecting microbial growth	3	2024-02-05	T4(383-386)	Chalk and Board
	6	Monod growth Kinetics	3	2024-02-06	T4(383-386)	Chalk and Board
	7	Conceptualnumericals	1	2024-02-07	T1exercise	Chalk and Board
	8	Case studies	3	2024-02-09	e-NOTES	Chalk and Board
5	1	Medium requirements for fermentation processes	3	2024-02-12	T4(108-119)	PPT
	2	Carbon,nitrogen,minerals,vitamins	3	2024-02-13	T4(108-119)	PPT
	3	Oxygen requirements	1	2024-02-14	T4(108-119)	PPT
	4	Medium formulation for optimal growth and product formation	3	2024-02-16	T4(108-119)	PPT
	5	examples of Simple and complex media	3	2024-02-19	T4(110),	PPT
	6	thermal death kinetics of microorganisms	3	2024-02-20	T4(108-119)	
	7	Batchandcontinuous heat – Sterilization of Liquid media	1	2024-02-21	T4(120-136)	
	8	Filter sterilization of liquid media	3	2024-02-23	T4(120-136)	
	9	Case studies	3	2024-02-26	e-NOTES	
		Revision-module 1	3	2024-02-27		
		Revision-module-2	3	2024-02-27		
		Revision-module-3	1	2024-02-28		Chalk and Board
			3	2024-03-01		Chalk and Board
						Chalk and Board



Revision-module-4	3	2024-03-08	Chalk and Board
Revision-module-5	3	1/2/23	Chalk and Board
Numericals	1	3/2/23	Chalk and Board

**Self-study topics (not included in syllabus)**

Sl.no.	Self-study topic	Suggested references
1	Media Optimization	Principles of fermentation technology- Stanburry

**Assignment topics**

Sl.no.	Assignment topic
1	Assignment from module 1 & 2
2	Assignment from module 2 & 3

**Course Outcomes:**

**Course Outcomes:** At the completion of the course the student will be able to:

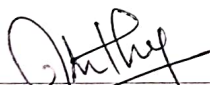
1. Understand the theories of chemical reaction and analyze experimental reaction kinetics data
2. Identify and summarize the parameters from range of reactions to optimize reactor design and development
3. Define concepts involved in enzyme-catalyzed reaction and develop equations for enzyme substrate reaction and describe regulatory enzymes
4. Demonstrate the use of various scientific parameters to improve the performance of fermentation process.
5. Formulate a suitable media for maximized microbial growth and product yields, by analyzing various parameters

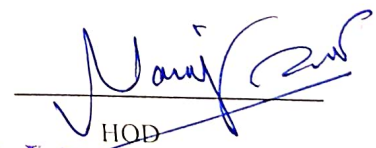
**Text books:**

1. Chemical Reaction Engineering-I-K.A.Gavhane
2. Bioprocess Engineering-Shuler & Kargi
3. Principles of Biochemistry-Lehninger
4. Biochemical engineering fundamentals-Bailey & Olis

**Reference Books**

1. Principles of fermentation technology-Stanburry and whittaker.

  
Faculty

  
HOD

**Dr. B.K MANJUNATH**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.



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**Lesson plan**

**Subject code:** 21 BT 52  
**Subject title:** Immunotechnology  
**Semester:** V

**Date:** 16/11/2023

**Course/branch:** Immunotechnology/Biotechnology  
**Academic year:** 2023-24 Odd Semester

**Faculty name:** Dr. Amulya G

**Objective of course:**

- To Learn the underlying concepts of molecular and cellular mechanisms involved in the development and regulation of the immune response.
- To Describe the cause for Immune System Disorders.
- To Learn the techniques of Immunodiagnostics.

**Prerequisite:** Cell biology, microbiology, molecular biology and genetic engineering

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	IMMUNE SYSTEM: Introduction;	4	27/11/23	T3-T5	Board and PPT
	2	Immunity-innate and acquired immunity; Haematopoiesis	2	28/11/23	T3-T5	Board and PPT
	3	Cells of immune system – lymphoid cells, mononuclear cells, granulocytes, dendritic cells & mast cells.	3	29/11/23	T3-T5	Board and PPT
	4	organs of immune system - primary and secondary lymphoid organs	5	1/12/23	T3-T5	Board and PPT
	5	Humoral and Cell mediated immunity	4	4/12/23	T3-T5	Board and PPT
	6	Antigens: Chemical and biological Factors affecting antigenicity/Immunogenicity and molecular nature	2	5/12/23	T3-T5	Board and PPT
	7	Haptens, adjuvants	3	6/12/23	T3-T5	Board and PPT
	8	Antibodies: structure and function	5	8/12/23	T3-T5	Board and PPT
	9	Immunoglobulin classes and subclasses (isotypic, allotypes).	4	11/12/23	T3-T5	Board and PPT
	10	Immunoglobulin classes and subclasses (idiotypes and anti-idiotypic antibodies).	2	12/12/23	T3-T5	Board and PPT
	11	Overall classification of immune cells	3	13/12/23	T3-T5	Interaction, Research articles
2	1	B-lymphocytes and their activation.	5	15/12/23	T1,R1	Board and PPT
	2	development and maturation. antibody genes and generation of diversity	4	18/12/23	T1,R1	Board and PPT
	3	Class switching mechanism	2	19/12/23	T1,R1	Board and PPT
	4	production of monoclonal antibodies	3	20/12/23	T1,R1	Board and PPT
	5	polyclonal antibodies and applications;	5	22/12/23	T1,R1	Board and PPT
	6	Thymus derived lymphocytes (T cells):activation,	2	26/12/23	T1,R1	Board and PPT
	7	development and maturation,	3	27/12/23	T1,R1	Board and PPT
	8	their ontogeny and types	2	2/1/24	Net source	Interaction
	9	Major histocompatibility Complex (MHC) Complex,	5	5/1/24	R2	Board and PPT
	10	MHC Class I and II molecules.	4	8/1/24	R1	Board and PPT
	11	Antigen processing and presentation process	2	9/1/24	T1,R1	Board and PPT



	1	Complement system,	3	10/1/24	T3-T5	Board and PPT
	2	pathways of complement activation and its functions	5	12/1/24	T3-T5	Board and PPT
	3	Hypersensitivity: Gell and Coombs classification of Hypersensitivity	4	13/1/24	T3-T5	Board and PPT
	4	Immune response to infections: immunity to viruses.	4	15/1/24	T3-T5	Board and PPT
	5	Immunity to bacteria, fungi and parasites;	2	16/1/24	T3-T5	Board and PPT
	6	Immunodeficiency disorders: Primary	3	17/1/24	T3-T5	Board and PPT
	7	secondary immunodeficiencies (AIDS);	5	19/1/24	T3-T5	Board and PPT
	8	Injury and inflammation	4	22/1/24	T3-T5	Board and PPT
	9	Vaccines and their types	2	23/1/24	T3-T5	Board and PPT
	11	production of recombinant vaccine – vaccine for hepatitis B surface antigen	3	24/1/24	Self notes	Live examples and interaction
	1	Transplantation and its classification,	5	2/2/24	T2, T4	Board and PPT
	2	Immunologic basis of graft rejection and its mechanism	5	2/2/24	T2, T4	Board and PPT
	3	transplantation antigens, tissue typing	4	5/2/24	R2	Board and PPT
	4	role of MHC molecules in allograft rejection	6	5/2/24	T2, T4	Board and PPT
	5	Clinical transplantations, bone marrow	2	6/2/24	T2, T4	Board and PPT
	6	HSC transplantation and immunosuppressive therapy.	3	7/2/24	T2, T4	Board and PPT
	7	Tumours of the immune system	5	9/2/24	T3-T5	Board and PPT
	8	tumour antigens	4	12/2/24	T2, T4	Board and PPT
	8	immune response to tumours	2	13/2/24	T2, T4	Board and PPT
	9	tumour immune-therapy	3	14/2/24	T2, T4	Board and PPT
	10	Treatment to tumour immune response	5	16/2/24	R1	Board and PPT
	1	Antigen antibody interaction – Precipitation reactions	4	19/2/24	R1, T2, T5	Board and PPT
	2	Agglutination reactions	2	20/2/24	R1, T2, T5	Board and PPT
	3	ABO Blood typing principles	3	21/2/24	T1	Board and PPT
	4	Principles and applications of ELISA	5	23/2/24	T2, T3	Board and PPT
	5	Radio Immuno Assay (RIA)	6	24/2/24	T2, T3	Board and PPT
	6	western blot analysis, immunoelectrophoresis	4	26/2/24	R1	Board and PPT
	7	Immunofluorescence, Fluorescence Activated Cell Sorting (FACS) analysis.	4	27/2/24	T2, T3	Board and PPT
	8	Role of stem cells technology in immunology	2	28/2/24	R1, T3	Board and PPT
	9	Production of humanized monoclonal antibodies	3	1/3/24	Self notes	Board and PPT
	10	Production of humanized monoclonal antibodies (Single chain fragment variable).	5	1/3/24	Self notes	Board and PPT
		Revision – module 1	5	1/3/24		Interaction
		Revision – module 2	5	1/3/24		Interaction
		Revision – module 3	5	1/3/24		Interaction
		Revision – module 4 & 5	5	1/3/24		Interaction

#### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Tumor cell interaction with drug receptors	Immunology: A Short Course Richard Coico, Geoffrey Sunshine Wiley-Blackwell 7th Edition, 2015

Assignment topics		Submission due on
Sl.no.	Assignment topic	15/01/24
1	Assignment from module 1 & 2	19/02/24
2	Assignment from module 3 & 4	15/03/24
3	Assignment from module 5	

#### Course Outcomes:


- Outline the molecular and cellular mechanisms involved in the development and regulation of the immune response.
- Detail the cause, challenges and treatment for Immune System Pathologies and Dysfunctions.
- Apply the major immunological laboratory techniques and their application to both clinical analysis and experimental research.

#### Text books:

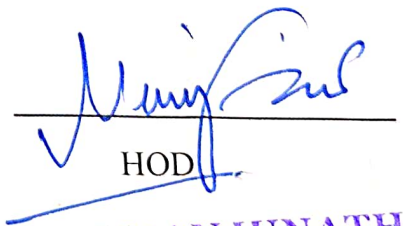
1. Kuby Immunology by by Jenni Punt, Sharon Stranford, Patricia Jones, Judith A Owen, WH Freeman; 8th ed. 2018.
2. Immunology – an Introduction by Tizard Thomson. Saunders College Publisng, 1984
3. Immunology & Immunotechnology, Ashim K Chakravarthy, Oxford University Press. 2006.
4. Immundiagnosics by S C Rastogi, New Age International. 1996.
5. Essential Immunology by Roitt I. Blackwell Scientific Publications, 13th Edition, 2017.

#### Reference Books

1. Immunology: A Short Course Richard Coico, Geoffrey Sunshine Wiley-Blackwell 7th Edition, 2015.
2. Understanding Immunology by Peter Wood, Pearson Education, 2001.



Faculty



HOD

**DR. B.K. MANJUNATHA**  
 Professor & Head  
 Department of Biotechnology  
 The Oxford College of Engineering  
 Bengaluru-560 068.





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**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF BIOTECHNOLOGY**

(Approved by AICTE, New Delhi, Accredited by NBA, New Delhi & Affiliated to VTU, Belgaum)

**Lesson plan**

**Subject code:** 21 BT 53

**Subject title:** structural biology & analytical techniques

**Semester:** V

**Faculty name:** Ms. Ramya K

**Date:** 11/9/2023

**Course/branch:** Biotechnology

**Academic year:** 2023-24 Odd Semester

**Objective of course:**

1. To learn about drug design, formulation
2. To understand importance of pharmacokinetics & pharmacodynamics study
3. To list the applications & advantages of Pharmaceutical & Clinical Biotechnology

**Prerequisite:** Drug Design, Pharmaceutical drugs

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	STRUCTURE AND CONFORMATION OF PROTEINS: Composition and primary structures of proteins, peptide geometries, phi, psi, omega angles,	1	27/11/23	T1,T2	PPT
	2	Ramachandran or steric contour diagram, allowed angles of side chains in proteins,	5	28/11/23	T1,T2	PPT
	3	Conformational analysis and forces that determine protein structures, hydrogen bonding,	1	1/12/23	T1,T2	PPT
	4	disulphide bonds, hydrophobic interactions, van der Waals forces, potential energy calculations.	6	1/12/23	T1,T2	PPT
	5	Secondary structures: alpha helices, beta sheets, turns. Thermodynamic aspects of protein folding.	1	4/12/23	T1,T2	PPT
	6	Relationship between the primary, secondary, and tertiary structure of proteins. Structure of IgG,	5	5/12/23	T1,T2	PPT
	7	fibrous proteins (structure of collagen, keratin). Quaternary structures – dimers (homo & heterodimers),	1	8/12/23	T1,T2	PPT
	8	trimers, tetramers; Popular Protein folds, structural families and classes, multifunctional domains (qualitative examples)	6	8/12/23	T1,T2	PPT
2	1	STRUCTURE AND CONFORMATION OF NUCLEIC ACIDS AND BIOMEMBRANES: General characteristics of nucleic acid structures (A, T, G, C, U),	1	11/12/23	T5,T6	PPT
	2	forces and stabilizing geometries, glycosidic bond, rotational isomers.	5	12/12/23	T5,T6	PPT
	3	Stabilizing ordered forms of DNA (A, B and Z),	1	15/12/23	T5,T6	PPT
	4	base pairing types, base stacking, tertiary structure of DNA (Supercoiled DNA),	6	15/12/23	T5,T6	PPT
	5	Melting of the DNA double helix (Hyperchromicity),	1	18/12/23	T5,T6	PPT
	6	Interaction with small ions and small molecules. Ribose puckering	5	19/12/23	T5,T6	PPT

	7	Tertiary structure of tRNA.	1	22/12/23	T5,T6	PPT
	8	Structure and conformational properties of cell membranes,	6	22/12/23	T5,T6	PPT
	9	Singer and Nicholson model, integral proteins in membranes,	5	25/12/23	T5,T6	PPT
	10	conformational variations during ion transport.	1	1/1/24	T5,T6	PPT
	11	Signal transduction and molecular reception (qualitative)	6	2/1/24	T5,T6	PPT
	1	BIOPHYSICAL TECHNIQUES: Rayleigh scattering, ultra-centrifugation	1	5/1/24	T3,T4	PPT
	2	viscometry, Electron microscopy-SEM,	5	5/1/24	T3,T4	PPT
	3	TEM, AFM	1	8/1/24	T3,T4	PPT
	4	luminescence (fluorescence & phosphorescence),	6	9/1/24	T3,T4	PPT
	5	Calorimetry, DSC,	1	22/1/24	T3,T4	PPT
	6	DTA/TGA, Mass spectrometry,	5	22/1/24	T3,T4	PPT
	7	MALDI-TOF, Voltage Clamp and	1	12/1/24	T3,T4	PPT
	8	Patch Clamp (measurements of membrane potentials). Flow cytometry	6	12/1/24	T3,T4	PPT
	1	SPECTROSCOPIC TECHNIQUES: X-ray diffraction: structure determination via single crystal diffraction,	1	13/1/24	T7,T8	PPT
	2	fibre diffraction; Neutron diffraction	5	16/1/24	T7,T8	PPT
	3	XPS, XAFS	1	19/1/24	T7,T8	PPT
	4	NMR spectroscopy (structure determination).	6	19/1/24	T7,T8	PPT
	5	ORD/CD	1	22/1/24	T7,T8	PPT
	6	UV, IR	5	23/1/24	T7,T8	PPT
	7	Laser Raman,.	1	27/1/24	T7,T8	PPT
	8	ESR/EPR	6	27/1/24	T7,T8	PPT
	1	ELECTROPHORETIC TECHNIQUES:.....	1	2/2/24	T7,T8	PPT
	2	Agarose gel electrophoresis, gradient electrophoresis, horizontal	5	2/2/24	T7,T8	PPT
	3	Vertical gel electrophoresis, isoelectric focusing, immune electrophoresis	1	5/2/24	T7,T8	PPT
	4	capillary electrophoresis and applications	6	6/2/24	T7,T8	PPT
	5	Chromatographic Techniques: Normal phase, adsorption, reverse phase, ion exchange	1	9/2/24	T7,T8	PPT
	6	size exclusion, hydrophobic interaction, bio-affinity and pseudoaffinity techniques	5	9/2/24	T7,T8	PPT
	7	GC, Paper chromatography	1	12/2/24	T7,T8	PPT
	8	TLC and HPLC and their applications	6	13/2/24	T7,T8	PPT
		Revision	1	16/2/24		
		Revision	5	16/2/24		
		Revision	1	19/2/24		
		Revision	6	20/2/24		
		Revision	1	23/2/24		
		Revision	5	23/2/24		
		Revision	1	24/2/24		
		Revision	1	26/2/24		
		Revision	6	27/2/24		
		Revision	1	1/3/24		



### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Agarosegelectrophoresis	Biophysical Chemistry, by Upadhyay, Himalaya Publishing House, 2010

### Assignment topics

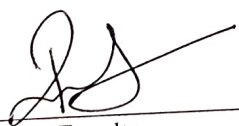
Sl.no.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	11/12/23
2	Assignment from module 2 & 3	13/1/24
3	Assignment from module 4 & 5	6/2/24

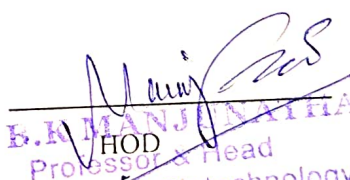
### Course Outcomes:

- 1 Describe the structural aspects of macromolecules like proteins, nucleic acids and biomembranes.
2. Demonstrate their structure function hypothesis via suitable techniques.
3. Apply the specific biophysical, spectroscopic, chromatographic techniques for various case studies.

### Text books:

1. Principles of protein structure by G Schulz and R H Schirmer, Springer Verlag, 1979.
2. Introduction to Protein Science by Arthur M Lesk, Oxford University Press, 2010
3. Biophysical Chemistry by Cantor R. and Schimmel P.R, W. H. Freeman, 1980.
4. Biophysical Principles of Structure & Function by Fred M. Snell & Sidney Shulman, Addison-Wesley Publishing, 1965.
5. Introduction to Protein Structure by Carl Branden and John Tooze, Garland Publishing, 1998.
6. Proteins Structure – A Practical Approach by Creighton, Oxford University Press, 1989.
7. Biophysical Chemistry, by Upadhyay, Himalaya Publishing House, 2010
8. Biophysical chemistry: 'Techniques for the study of biological structure and function', CR Cantor and PR Schimmel. WH Freeman and Co, Oxford Press. 1980.

  
Faculty

  
Dr. B.K. MANJUNATHA  
HOD  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.



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**Subject code:** 21BT54

**Lesson plan**

**Date:** 23/11/2023

**Subject title:** Genomics, Proteomics And Bioinformatics

**Course/branch:** Biotechnology

**Semester:** V

**Academic year:** 2023-24 Odd Sem

**Faculty name:** Dr. Salma Kausar M.

**Objective of course:**

1. To inculcate the fundamentals of Genomics, Proteomics and Bioinformatics.
2. To comprehend the applications of Genomics, Proteomics and Bioinformatics in biotechnology research.
3. To impart knowledge of various software tools used in Genomics, Proteomics and Bioinformatics studies.

**Prerequisite:** Molecular biology, microbiology & genetic engineering knowledge.

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	INTRODUCTION: Types of polymorphism, genome sequences and data base subscriptions.	2	27.11.23	T1(1.1-1.35)	Chalk & Talk
	2	Early sequencing efforts. Extraction of DNA	3	28.11.23	T1(1.1-1.35)	Chalk & Talk
	3	Methods of preparing genomic DNA for sequencing	2	29.11.23	T1(1.1-1.35)	Chalk & Talk
	4	DNA sequence analysis methods-Maxam & Gilbert Method, Sanger Dideoxy method	1	30.11.23	T1(1.1-1.35)	Chalk & Talk
	5	Fluorescence method,shot-gun approach.NGS methods and their principles.	2	4.12.23		Chalk & Talk
	6	BioinformaticstoolsandautomationinGenomeSequencing,analysisofrawgenomesequencedata, Transcriptome (RNA) sequencing	3	5.12.23	T1(1.1-1.35)	PPT,Smartboard
	7	Exome sequencing, Genome Annotation, Using NGS to detect sequence variants	2	6.12.23	T1(2.2-2.5)	PPT,Smartboard
	8	Utility ofEST database in sequencing	1	7.12.23	T1-exercise	PPT,Smartboard
2	1	GENOMICS: Transcription factors and the coordination of gene expression	2	11.12.23	T1(3.1-4.6)	PPT,Smartboard
	2	Gene variation and Single Nucleotide Polymorphisms (SNPs)	3	12.12.23	T1(3.1-4.6)	PPT,Smartboard
	3	Bioinformatics in detection of Polymorphisms - dbSNP.	2	13.12.23	T2(207-209)	PPT,Smartboard
	4	Gene-disease association, diagnostic genes and drug targets, genotyping tools-DNA Chips.	1	14.12.23	T1(5.1-5.59)	PPT,Smartboard
	5	Genome projects of Model systems: Drosophila, Yeast, C.elegans. E.coli. Arabidopsis and rice	2	18.12.23		PPT,Smartboard
	6	Human genome Project and the genetic map.	3	19.12.23	T2(207-209)	PPT,Smartboard
	7	Interference RNA, RNA silencing, SiRNA. Genetic and physical maps: Breeding requirements for mapping.	2	20.12.23	T2(207-209)	PPT,Smartboard Case study
	8	Molecular markers - RFLP, RAPD, AFLP, Microarray in functional genomics.	1	21.12.23	T1 & T2 exercise	Seminar
	9	Bioinformatics tools in microarray data analysis.	3	26.12.23	T1 & T2 exercise	Seminar, interactive class
	10	Toolsforcomparativegenomics:BLAST2,Vista, MUMmer, COG, VOG. Mummer, COG, VOG.	2	27.12.23	T1 excercise	PPT,Smartboard
3	1	PROTEOMICS: Two-dimensional PAGE for proteome analysis, Edman protein	3	2.01.24	T1(7.1-7.2)	PPT,Smartboard



	2	Detection of proteins on SDS gels, Protein cleavage.	2	3.01.24	T1(7.3-7.6)	PPT,Smartboard
	3	Micro sequencing. Automation in proteomics	1	4.01.24	T1(7.11-7.12)	PPT,Smartboard
	4	Protein protein interaction assays - Two-hybrid methods, TAP/ GFP tags	2	8.01.24	T4 exercise	Seminar, interactive class
	5	Phage Display. Mass-spec based analysis of protein expression. MS-MS approaches	3	9.01.24	T1(7.12-7.14)	PPT,Smartboard
	6	Peptide Mass finger printing and Post Translational Modifications	2	10.01.24	T1(4.17-4.1)	PPT,Smartboard
	7	Interactomics. Protein Arrays and "Protein Chip" - interactions and detection techniques.	1	11.01.24	T1 exercise	PPT,Smartboard
	8	Phage antibodies as tools for proteomics. Proteome-wide interaction maps, Proteomics workflows	3	16.01.24	Self notes	PPT,case study
	9	Proteomics and the study of diseases, Applications of proteome analysis to drug development and toxicology	2	17.01.24	T1 exercise	PPT,Smartboard
	10	Organelle proteomic .Protein Engineering	1	18.01.24		PPT,Smartboard
4	1	DATABASES & SEQUENCE ANALYSIS: Bioinformatics resources: NCBI, EBI, ExPASy, RCSB..	2	22.01.24	T3(184-185)	PPT,Smartboard
	2	Significance of databases towards informatics projects	3	23.01.24	T3(186-188)	PPT,Smartboard
	3	Databases and classifications. GenBank, DDBJ, EMBL, PIR, Uniprot-KB, SWISS-PROT, TrEMBL. Genebank flatfile.	2	24.01.24	T3 exercise	PPT,Smartboard
	4	Protein Data Bank (PDB) flat file; FASTA Format, PIR Format; Structure file formats. the Modular Nature of proteins	1	25.01.24	T3(189-192)	PPT,case study
	5	Optional Alignment Methods, substitution matrices, Statistical significance of Alignments, BLAST and its Different types	2	05.02.24	T3(189-192)	PPT,case study
	6	Progressive Alignment Methods, MUSCLE, Motifs and Patterns, PROSITE, Hidden Markov Models (HMMs).	3	06.02.24	T3(195-194)	PPT,Smartboard
	7	Phylogenetic analysis: Alignment, Tree Building, and Tree Evaluation, Tree – Building Methods- Distance based and character-based methods	2	07.01.24	T3 exercise	PPT,Smartboard
	8	Evaluating Trees and Data Bootstrapping (parametric and non-parametric).	1	08.01.24	Self notes	PPT,Smartboard
5	8	Phylogenetic softwares (CLUSTAL-omega, PHYLIP etc),	2	12.01.24	T3(201-207)	PPT,Smartboard
	1	INSILICO APPLICATIONS: Detecting Functional Sites in the Prokaryotic and Eukaryotic Genomes (promoters, transcription factor binding sites, translation initiation sites), (GENSCAN, GRAIL, GENEFINDER)	3	13.01.24	T4(383-386)	PPT,Smartboard
	2	Integrated Gene Parsing, finding RNA Genes, Web based tools	2	14.01.24	Self notes	PPT,case study
	3	Protein Identity based on composition, Physical properties Based on sequence	1	15.01.24	T2(168,394)	PPT,Smartboard
	4	Secondary structure and folding classes, tertiary structure	2	19.01.24	T4 exercise	PPT,Smartboard
	5	protein fold prediction tools, Related web-based software (JPRED, NN-PREDICT, SOPMA, DSSP, STRIDE)	3	20.01.24	T4(108-119)	PPT,Smartboard
	6	Restriction mapping, Utilities, DNA strider, MacVector and OMIGA	2	21.01.24	T4(108-119)	PPT,Smartboard

7	Web based tools (MAP, REBASE); Primer design – need for tools.	1	22.02.24	T4(110), T4(108-119)	PPT,Smartboard
8	Primer design programs and software (PRIME3). 3D Structure Modeling in drug discovery	2	26.02.24	T4(120-136)	PPT,Smartboard
9	Molecular docking, quantitative structure activity relationship(QSAR),	3	27.02.24	T4(120-136)	PPT,Smartboard
10	Deriving the Pharmacophoric Pattern, Receptor Mapping,	2	28.02.24	T4(110), T4(108)	PPT,Smartboard
11	Estimating Biological Activities, Ligand-Receptor Interactions: Docking softwares (AUTODOCK,HEX)	1	29.02.24	T4(110), T4(108)	PPT,Smartboard

#### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Building a phylogenetic tree considering a case study using PHYLIP tool	Genomics and Proteomics Principles, Technologies, and Applications. By Devarajan Thangadurai and Jeyabalan Sangeetha. Apple Academic Press,2021.

#### Assignment topics

Sl.no.	Assignment topic	Submission due on
1	Bootstrapping:- parametric & Non parametric methods Case study	5/1/24
2	Next generation Sequencing –application case study	9/02/24

**Course Outcomes:** At the end of the course the student will be able to:

- Detail the basic concepts in Genomics, Proteomics and Bioinformatics.
- Demonstrate the applications of Genomics, Proteomics and Bioinformatics in biotechnology research.
- Apply various software tools used in Genomics, Proteomics and Bioinformatics for specific case studies.

#### Text books:

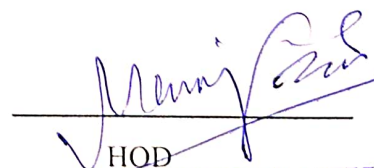
1. Genomics and Proteomics Principles, Technologies, and Applications. By Devarajan Thangadurai and Jeyabalan Sangeetha. Apple Academic Press,2021.
2. Concepts and Techniques in Genomics and Proteomics, by N Saraswathy, P Ramalingam.. Woodhead Publishing Series in Biomedicine, 2011.
3. Introduction to Proteomics by D.C Liebler; Humana Press, 2002.
4. Introduction to Genomics Arthur M Lesk, Oxford University Press, 2007

#### Reference Books

1. Discovering Genomics, Proteomics & Bioinformatics,by A M Campbell & L J Heyer, Pearson Education, 2007
2. Proteins and Proteomics by Richard J Simpson, IK International, 2003.
3. Genomics & Proteomics by Sabesan Ane Books, 2007.



Faculty



HOD  
**Dr. B.K. MANJUNATHA**  
 Professor & Head  
 Department of Biotechnology  
 The Oxford College of Engineering  
 Bengaluru-560 068.





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Lesson plan

Subject code: 21 RM 56

Date: 16/11/2023

Subject title: Research methodology & Intellectual Property rights

Course/branch: Biotechnology

Semester: V

Academic year: 2023-24 Odd Semester

Faculty name: Dr. Anulya G

Objective of course:

- To Understand the knowledge on basics of research and its types.
- To Learn the concept of Literature Review, Technical Reading, Attributions and Citations.
- To learn Ethics in Engineering Research.
- To Discuss the concepts of Intellectual Property Rights in engineering.

Prerequisite: Ethics and IPR, projects and research

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	Meaning of Research,.	6	28/11/23	T1	Chalk and board
	2	Objectives of Engineering Research	1	29/11/23	T1	Chalk and board
	3	Motivation in Engineering Research	4	01/12/23	T1	Chalk and board
	4	Types of Engineering Research	6	05/12/23	T1	PPT and collection of articles
	5	Finding and Solving a Worthwhile Problem	1	06/12/23	T1	Chalk and board
	6	Ethics in Engineering Research, Ethics in Engineering Research Practice.	4	08/12/23	T1	Chalk and board
	7	Types of Research Misconduct, Ethical Issues Related to Authorship.	6	12/12/23	T1	Chalk and board
2	1	Literature Review and Technical Reading	1	13/12/23	T1	Chalk and board
	2	New and Existing Knowledge, Analysis and Synthesis of Prior Art Bibliographic Databases	4	15/12/23	T1	Chalk and board
	3	Web of Science, Google and Google Scholar, Effective Search: The Way Forward.	6	19/12/23	Internet	From internet, Smart board
	4	Introduction to Technical Reading Conceptualizing Research, Critical and Creative Reading, Taking Notes While Reading, Reading Mathematics and Algorithms, Reading a Datasheet.	1	20/12/23	T1	Chalk and board
	5	Attributions and Citations: Giving Credit Wherever Due, Citations: Functions and Attributes	4	22/12/23	T1	From internet, Smart board
	6	Impact of Title and Keywords on Citations, Knowledge flow through citations. Citing Datasets, Styles for Citations.	6	26/12/23	T1	From internet, Smart board
	7	Acknowledgments and Attributions, What Should Be Acknowledged, Acknowledgments in, Books Dissertations, Dedication or Acknowledgments	1	27/12/23	Self notes	From internet, Smart board
	1	IP Governance, IP as a Global Indicator of Innovation, Origin of IP History of IP in India.	6	02/01/24	T1	Chalk and board
	2	Major Amendments in IP Laws and Acts in India.	1	03/01/24	T1	Chalk and board

3	3	Patents: Conditions for Obtaining a Patent Protection, To Patent or Not to Patent an Invention.	4	05/1/24	T1	Chalk and
	4	Rights Associated with Patents. Enforcement of Patent Rights. Inventions Eligible for Patenting. Non-Patentable Matters. Patent Infringements. Avoid Public Disclosure of an Invention before Patenting.	6	09/1/24	T1	Chalk and
	5	Process of Patenting. Prior Art Search. Choice of Application to be Filed. Patent Application Forms.	1	10/1/24	T1	Chalk and
	6	Jurisdiction of Filing Patent Application. Publication. Pre-grant Opposition. Examination. Grant of a Patent. Validity of Patent Protection. Post-grant Opposition.	4	12/1/24	T1	Chalk and
	7	Commercialization of a Patent. Need for a Patent Attorney/Agent. Can a Worldwide Patent be Obtained. Do I Need First to File a Patent in India. Patent Related Forms. Fee Structure.	6	16/1/24	T2	Chalk and
	8	Types of Patent Applications. Commonly Used Terms in Patenting. National Bodies Dealing with Patent Affairs. Utility Models	1	17/1/24	T2	Chalk and
	1	Copyrights and Related Rights: Classes of Copyrights. Criteria for Copyright. Ownership of Copyright. Copyrights of the Author.	4	19/1/24	T2	Chalk and
	2	Copyright Infringements. Copyright Infringement is a Criminal Offence. Copyright Infringement is a Cognizable Offence. Fair Use Doctrine. Copyrights and Internet. Non-Copyright Work.	6	23/1/24	T2	Chalk and
4	3	Copyright Registration. Judicial Powers of the Registrar of Copyrights. Fee Structure. Copyright Symbol. Validity of Copyright. Copyright Profile of India. Copyright and the word 'Publish'.	1	24/1/24	T2	Chalk and
	4	Transfer of Copyrights to a Publisher. Copyrights and the Word 'Adaptation'. Copyrights and the Word 'Indian Work'.	3	27/1/24	T2	Chalk and
	5	Joint Authorship. Copyright Society. Copyright Board. Copyright Enforcement Advisory Council (CEAC).	6	30/1/24	News articles	Chalk and
	6	International Copyright Agreements, Conventions and Treaties.	4	02/2/24	T2	Chalk and
	7	Interesting Copyrights Cases. Trademarks: Eligibility Criteria. Who Can Apply for a Trademark. Acts and Laws.	6	06/2/24	T2	Chalk and
	8	Designation of Trademark Symbols. Classification of Trademarks.	1	07/2/24	T2	Chalk and l
	9	Registration of a Trademark is 'Not Compulsory. Validity of Trademark. Types of Trademark Registered in India.	4	9/2/24	T2	Chalk and t



10	Trademark Registry. Process for Trademarks Registration. Prior Art Search. Famous Case Law: Coca-Cola Company vs. Bisleri International Pvt. Ltd.	6	13/2/24	T2	Chalk and board
1	Industrial Designs: Eligibility Criteria. Acts and Laws to Govern Industrial Designs. Design Rights. Enforcement of Design Rights.	1	14/2/24	T2	Examples from sources
2	Non-Protectable Industrial Designs India. Protection Term. Procedure for Registration of Industrial Designs. Prior Art Search.	4	16/2/24	T2	PPT and clipping from internet
3	Application for Registration. Duration of the Registration of a Design. Importance of Design Registration.	6	20/2/24	T2	Chalk and board
4	Cancellation of the Registered Design. Application Forms. Classification of Industrial Designs.	1	21/2/24	T2	Chalk and board
5	Designs Registration Trend in India. International Treaties. Famous Case Law: Apple Inc. vs. Samsung Electronics Co.	4	23/2/24	T2	Chalk and board
6	Geographical Indications: Acts, Laws and Rules Pertaining to GI. Ownership of GI. Rights Granted to the Holders. Registered GI in India.	6	27/2/24	T2	Chalk and board
7	Identification of Registered GI. Classes of GI. Non-Registerable GI. Protection of GI. Collective or Certification Marks. Enforcement of GI Rights. Procedure for GI Registration Documents Required for GI Registration.	1	28/2/24	Self notes	Chalk and board
8	GI Ecosystem in India. Case Studies on Patents. Case study of Curcuma (Turmeric) Patent, Case study of Neem Patent. Case study of Basmati patent. IP Organizations In India. Schemes and Programmes	4	01/3/24	Self notes	Chalk and board
	Revision – module 1-5		1/3/24		Interaction

#### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Preparing Literature survey based on topic of interest. Getting to know different types of research publications	David V. Thiel "Research Methods for Engineers" Cambridge University Press, 978-1-107-03488- 4

#### Assignment topics

Sl.no.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	17/01/24
2	Assignment from module 3 & 4	21/02/24
3	Assignment from module 5	11/03/24

**Course Outcomes:**

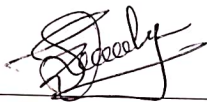
- To know the meaning of engineering research.
- To know the procedure of Literature Review and Technical Reading.
- To know the fundamentals of patent laws and drafting procedure.
- Understanding the copyright laws and subject matters of copyrights and designs
- Understanding the basic principles of design rights

**Text books:**

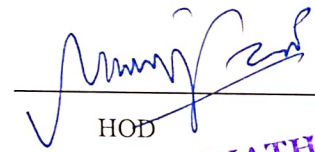
1. Dipankar Deb, Rajeeb Dey, Valentina E. Balas "Engineering Research Methodology", ISSN 1868-4394 ISSN 1868-4408 (electronic), Intelligent Systems Reference Library, ISBN 978-981-13-2946-3 ISBN 978-981-13-2947-0 (eBook), <https://doi.org/10.1007/978-981-13-2947-0>.
2. Intellectual Property A Primer for Academia by Prof. Rupinder Tewari Ms. Mamta Bhardwa.

**Reference Books**

1. David V. Thiel "Research Methods for Engineers" Cambridge University Press, 978-1-107-03488-4
2. Intellectual Property Rights by N.K.Acharya Asia Law House 6th Edition. ISBN: 978-93-81849-30-9



Faculty



HOD

**DR. B.K. MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.



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**DEPARTMENT OF BIOTECHNOLOGY**  
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**Subject code:** 21BT584

**Lesson plan**

**Date:** 23/11/2023

**Subject title:** Good Manufacturing and Laboratory Practices

**Course/branch:** Biotechnology

**Semester:** V

**Academic year:** 2023-24 Odd Sem

**Faculty name:** Dr. Salma Kausar M.

**Objective of course:**

- To Understand the basics of GMP and GLP
- To deduce the importance of regulatory compliance in BT related industries
- To Understand the validation of processes and products in BT industries (via case studies)

**Prerequisite:** Biomolecules & biochemistry knowledge.

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	INTRODUCTION: Meaning, History of GMP and GLP. Scope of coverage of GMP and GLP.	2	01.12.23	T1(1.1-1.35)	Case study smart board usage
	2	Key areas: GMP- for production and process focus,	2	08.12.23	T1(1.1-1.35)	Case study smart board usage
	3	GLPs- for research and study focus. WHO guidelines.	2	15.12.23	T1(1.1-1.35)	Case study smart board usage
2	1	GOOD MANUFACTURING PRACTICE : Compliance, cGMP (current GMP), its role for under manufacturing.	2	22.12.23	Self notes	Case study smart board usage
	2	conditions of lighting, hygiene, storage, equipment maintenance, and separation of substances to avoid contamination	2	05.01.24	Self notes	Case study smart board usage
	3	Application of GMP for production and, ethical dimension in manufacturing and control.	2	12.01.24	Self notes	Case study smart board usage
3	1	GOOD LABORATORY PRACTICES: Compliance. Purpose for safeguarding the data integrity.	2	19.01.24	T1(7.1-7.2)	Case study smart board usage
	2	Key areas: monitoring (conditions, processes, documentation) and archiving of studies performed in labs.	2	27.01.24	T1(7.3-7.6)	Case study smart board usage
	3	Regulation for researching or marketing drugs for humans and animals, human cells/tissues, food color additives, perfumes, medical devices, biologics, and pesticides.	2	02.02.24	T1(7.11-7.12)	Case study smart board usage
4	1	INTERNATIONAL COUNCIL ON HARMONISATION GUIDELINES (ICH): Introduction, usage, National and international regulatory authorities and their function,	2	09.02.24	T3(184-185)	Case study smart board usage
	2	Regulation of Clinical and Preclinical Studies,	2	16.02.24	T3(186-188)	Case study smart board usage
	3	Formulation Production Management.	2	23.02.24	exercise	Case study smart board usage
5	1	VALIDATION: Need, scope, importance,	2	01.03.24	Self notes )	Case study smart board usage
	2	limitations, types of validation (in Pharma	2	09.03.24	Self notes	Case study smart



		and food industry),				board usage
	3	Validation of analytical procedures, Cleaning and disinfection	2	15.03.24	Self notes	Case study smart board usage

**Self-study topics (not included in syllabus)**

Sl.no.	Self-study topic	Suggested references
1	Conditions of lighting in Industrial processes.	<a href="https://www.udemy.com/course/basic-good-manufacturing-practices-gmp/">https://www.udemy.com/course/basic-good-manufacturing-practices-gmp/</a>

**Assignment topics**

Sl.no.	Assignment topic	Submission due on
1	Separation of substances to avoid contamination	5/1/24
2	Marketing drugs for humans and animals	9/02/24

**Course Outcomes:** At the end of the course the student will be able to:

1. Apply principles of biology & basic management to comprehend the aspects of GLP, GMP & GCP
2. Identify situations wherein deviations in regulatory compliance have occurred on the basis of case examples/studies
3. Correlate & distinguish between the compliance requirements for GLP, GMP & GCP in their respective contexts

**Text books:**

1. cGMP starter guide: Principles in Good Manufacturing Practices for Beginners, Emmet P. Tobin, Createspace
2. Independent Publishing Platform, April 2016.  
Good Manufacturing Practices for Pharmaceuticals: GMP in Practice, B Cooper, Createspace Independent Publishing Platform, July 2017

**Reference Books**

1. Drug regulatory affairs, CBS publication, Gajendra Singh, Gaurav Agarwal and Vipul Gupta, 2005.

  
Faculty

  
HOD

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Professor & Head  
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**LESSON PLAN**

**Subject title:** Bioprocess Engineering  
**Course/branch:** Biotechnology  
**Academic year:** 2023-24 (ODD)

**Subject code:** 18BT71  
**Semester:** VII  
**Faculty name:** Dr. Indulekha John

**Objectives of Course:**

- Define the fundamentals of downstream processing for biochemical product recovery.
- Understand the concepts of secondary metabolite production.
- Assess the impact of change in unit's operations and the impact on the process.
- Examine traditional unit operations, as well as new concepts and emerging technology that is likely to benefit biochemical product recovery in the future.

**Prerequisite:** Basic knowledge of Fermentation, Separation and Downstream Processing.

Module	Topic no.	Topics planned	Period	Date	Books ref. & page no.	Pedagogy
1	1	Introduction on fermentation technology	2	Wed, Sep 20, 2023	R1( 1-3)	PPT
	2	submerged and solid state fermentation.	4	Thu, Sep 21, 2023	T2 ( 23-24)	PPT
	3	Batch, continuous, fed-batch.	4	Mon, Sep 25, 2023	T2 ( 14-16)	PPT
	4	Microbial growth kinetics.	1	Tue, Sep 26, 2023	T2 ( 14-16)	PPT
	5	Optimization of fermentation process	2	Wed, Sep 27, 2023	T2 ( 14-16)	PPT
	6	Strategies to optimize product yield	2	Tue, Oct 03, 2023	T2( 16-21)	PPT
	7	Production of primary and secondary metabolites.	4	Wed, Oct 04, 2023	T2 ( 82-84)	PPT
	8	Production of antibiotics	4	Thu, Oct 05, 2023	T1(18-20)	PPT
	9	Strain improvement	1	Mon, Oct 09, 2023	T2 (101-106)	PPT
	10	Process design criteria for byproducts	2	Tue, Oct 10, 2023	T2 (108-109)	PPT
	11	Microbiology of brewing	4	Wed, Oct 11, 2023	Self notes	PPT
2	1	Enumeration and screening of novel microbial primary	1	Thu, Oct 12, 2023	T2 (948-50)	PPT
	2	Secondary metabolites	2	Mon, Oct 16, 2023	T2 (45-50)	PPT
	3	strain improvement strategies	4	Tue, Oct 17, 2023	T2 (50-53)	PPT
	4	Industrial application of secondary metabolites.	4	Wed, Oct 18, 2023	R3( 60-61)	PPT
	5	Production of antibiotics	1	Thu, Oct 19, 2023	T2 (54-60)	PPT
	6	Preservation of microbial culture	4	Wed, Oct 25, 2023	T2 ( 61-62)	PPT
	7	Secondary metabolite production-strategies for optimizing product yield	1	Thu, Oct 26, 2023	T2 ( 61-62)	PPT
	8	Culture conditions, selection of high yielding lines,	4	Mon, Oct 30, 2023	T2 ( 62-66)	PPT
	9	Factors affecting secondary metabolites,	1	Tue, Oct 31, 2023	T2 ( 66-69)	PPT





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**LESSON PLAN**

**Subject title:** Bioprocess Engineering  
**Course/branch:** Biotechnology  
**Academic year:** 2023-24 (ODD)

**Subject code:** 18BT71  
**Semester:** VII  
**Faculty name:** Dr. Indulekha John

**Objectives of Course:**

- Define the fundamentals of downstream processing for biochemical product recovery.
- Understand the concepts of secondary metabolite production.
- Assess the impact of change in unit's operations and the impact on the process.
- Examine traditional unit operations, as well as new concepts and emerging technology that is likely to benefit biochemical product recovery in the future.

**Prerequisite:** Basic knowledge of Fermentation, Separation and Downstream Processing.

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	2	submerged and solid state fermentation.	4	Thu, Sep 21, 2023	T2 ( 23-24)	PPT
	3	Batch, continuous, fed-batch.	4	Mon, Sep 25, 2023	T2 ( 14-16)	PPT
	4	Microbial growth kinetics.	1	Tue, Sep 26, 2023	T2 ( 14-16)	PPT
	5	Optimization of fermentation process	2	Wed, Sep 27, 2023	T2 ( 14-16)	PPT
	6	Strategies to optimize product yield	2	Tue, Oct 03, 2023	T2( 16-21)	PPT
	7	Production of primary and secondary metabolites.	4	Wed, Oct 04, 2023	T2 ( 82-84)	PPT
	8	Production of antibiotics	4	Thu, Oct 05, 2023	T1(18-20)	PPT
	9	Strain improvement	1	Mon, Oct 09, 2023	T2 (101-106)	PPT
	10	Process design criteria for byproducts	2	Tue, Oct 10, 2023	T2 (108-109)	PPT
	11	Microbiology of brewing	4	Wed, Oct 11, 2023	Self notes	PPT
2	1	Enumeration and screening of novel microbial primary	1	Thu, Oct 12, 2023	T2 (948-50)	PPT
	2	Secondary metabolites	2	Mon, Oct 16, 2023	T2 (45-50)	PPT
	3	strain improvement strategies	4	Tue, Oct 17, 2023	T2 (50-53)	PPT
	4	Industrial application of secondary metabolites.	4	Wed, Oct 18, 2023	R3( 60-61)	PPT
	5	Production of antibiotics	1	Thu, Oct 19, 2023	T2 (54-60)	PPT
	6	Preservation of microbial culture	4	Wed, Oct 25, 2023	T2 ( 61-62)	PPT
	7	Secondary metabolite production-strategies for optimizing product yield	1	Thu, Oct 26, 2023	T2 ( 61-62)	PPT
	8	Culture conditions, selection of high yielding lines,	4	Mon, Oct 30, 2023	T2 ( 62-66)	PPT
	9	Factors affecting secondary metabolites,	1	Tue, Oct 31, 2023	T2 ( 66-69)	PPT

	10	Elicitation	1	Thu, Nov 02, 2023		Chalk & Board
	11	Seminar on antibiotic production	2	Mon, Nov 06, 2023	T2 (66-69)	Chalk & Board
3	1	Role and importance of downstream processing	4	Tue, Nov 07, 2023	T2 (188-190)	Chalk & Board
	2	Problems and requirements of byproduct purification	4	Wed, Nov 08, 2023	T2 (190-192)	Chalk & Board
	3	Economics of downstream processing in Biotechnology	1	Thu, Nov 09, 2023	R1(237)	Chalk & Board
	4	Cost cutting strategies	4	Mon, Nov 13, 2023	(197-202)	Chalk & Board
	5	Cell disruption methods for intracellular products,	2	Wed, Nov 15, 2023	II(216-217)	Chalk & Board
	6	Flocculation and sedimentation	4	Thu, Nov 16, 2023	T2 (190-192)	Chalk & Board
	7	Centrifugation (ultra and differential)	4	Mon, Nov 20, 2023	T2 (225-227)	Chalk & Board
	8	Filtration methods	1	Tue, Nov 21, 2023	T2 (232-235)	Chalk & Board
	9	Precipitation methods with salts, organic solvents, and polymers,	4	Wed, Nov 22, 2023	T2 (227-234)	Chalk & Board
	10	Aqueous two-phase extraction	4	Thu, Nov 23, 2023	T2 (236-237)	Chalk & Board
	11	Supercritical extraction	1	Mon, Nov 27, 2023	T2 (227-234)	Chalk & Board
4	1	Membrane – based separations theory	1	Tue, Nov 28, 2023	T2 (254-260)	Chalk & Board
	2	Design and configuration	2	Wed, Nov 29, 2023	T2 (265-273)	Chalk & Board
	3	Solute polarization and cake formation	2	Mon, Dec 04, 2023	T2 (274-277)	Chalk & Board
	4	Causes, consequences and control techniques	4	Tue, Dec 05, 2023	T2 (274-280)	Chalk & Board
	5	Use of membrane diffusion	4	Wed, Dec 06, 2023	T2 (274-280)	Chalk & Board
	6	Separation by solvent membranes	1	Thu, Dec 07, 2023	T2 (274-280)	Chalk & Board
	7	Reverse osmosis	2	Mon, Dec 11, 2023	R1(387-389)	Chalk & Board
	8	Pressure driven processes	2	Tue, Dec 12, 2023	T2 (324-343)	Chalk & Board
	9	Concentration driven process	4	Wed, Dec 13, 2023	Self notes	Chalk & Board
	10	Tutorial on ultrafiltration	4	Thu, Dec 14, 2023	T1(518-530)	Chalk & Board
	11	Tutorial on concentration polarization	1	Mon, Dec 18, 2023	T2 (367-372)	Chalk & Board
5	1	Principle and Applications of Electrophoresis	2	Tue, Dec 19, 2023	T2 (60-62)	Chalk & Board
	2	Electrophoresis - their types	4	Wed, Dec 20, 2023	T2 (62-64)	Chalk & Board
	3	Principles and protocols of Chromatographic techniques	4	Thu, Dec 21, 2023	T2 (402-405)	Chalk & Board
	4	Thin layer chromatography	1	Tue, Dec 26, 2023	T2 (407-422)	Chalk & Board
	5	Single and two-dimensional (Both Ascending and Descending) Chromatography	2	Wed, Dec 27, 2023	T2 (422-429)	Chalk & Board



6	Gel Filtration Chromatography	4	Thu, Dec 28, 2023	T2 ( 390-400)	Chalk & Board
7	Adsorption column chromatography	4	Mon, Jan 01, 2024	T2 ( 422-429)	Chalk & Board
8	Ion Exchange Chromatography	1	Tue, Jan 02, 2024	T2 ( 402-405)	Chalk & Board
9	Affinity Chromatography	4	Wed, Jan 03, 2024	T2 ( 422-429)	Chalk & Board
10	Gas Chromatography	1	Thu, Jan 04, 2024	T2 ( 390-400)	Chalk & Board
11	High Performance liquid chromatography (HPLC) analytical and preparative	4	Mon, Jan 08, 2024	T2 ( 402-405)	Chalk & Board

Self-study Topics (Out -of- Syllabus)		Suggested Reference
Sl. No.	Self-study Topics	Wastewater Engineering by Metcalf and Eddy
1	Membrane Bioreactors	Principles of fermentation technology-P.F.Stanburry
2	Media formulation	

Assignment Topics		Submission due on
Sl. No.	Assignment Topics	13/11/23
1	Industrial production of commercially important antibiotics	3/01/24
2	Integrated bioprocessing and separation using solvent membranes	

#### Course outcomes:

- Study and design various statistical problems.
- Describe the factors affecting secondary metabolite production and its industrial importance.
- Identify and summarize the effect of change in unit's operations and its impact on the process.
- Illustrate how emerging technologies would benefit the bio chemical product recovery and show the likely benefits it would have over the traditional operations.
- Analyzing both analytical and process validation issues that are critical to successful manufacturing.

#### Text books:

1. Principles of fermentation Technology by P.F. Stanbury and A. Whitaker, Pergamon Press.
2. Animal Cell Technology by Asok Mukhopadhyay, IK Intl. Ltd.
3. Downstream Process Technology – A new horizon in Biotechnology by Nooralabetta Krishna Prasad, PHI Learning Private Limited.
4. Bioseparation – Downstream processing for biotechnology by Belter P.A., Cussier E. and Wei Shan Hu., Wiley Interscience Pub.

#### Reference books

1. Rate controlled separations by Wankat P.C., Elsevier.
2. Animal cell culture Techniques by Ian Freshney, Wiley-Liss.
3. Animal Cell biotechnology by R.E. Spier and J.B. Griffiths, Academic press.
4. Bioprocess Engineering by Shule and Kargi, Prentice Hall.

  
HOD

**Dr. B.K MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.



Faculty





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**Lesson plan**

**Subject code:** 18 BT 72

**Subject title:** Clinical and Pharmaceutical Biotechnology

**Semester:** V II

**Faculty name:** Ms. Ramya K

**Date:** 11/9/2023

**Course/branch:** Biotechnology

**Academic year:** 2023-24 Odd Semester

**Objective of course:**

1. To learn about drug design, formulation
2. To understand importance of pharmacokinetics & pharmacodynamics study
3. To list the applications & advantages of Pharmaceutical & Clinical Biotechnology

**Prerequisite:** Drug Design, Pharmaceutical drugs

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	DRUG MANUFACTURE AND FORMULATION: Introduction to pharma industry..	1	12/9/23	T1,T2	PPT
	2	Biotechnology and Drug design	4	13/9/23	T1,T2	PPT
	3	Basic concepts and applications, composition, preparation,	4	14/9/23	T1,T2	PPT
	4	physicochemical considerations in manufacture of current biotech products & herbal medicines.	3	15/9/23	T1,T2	PPT
	5	Need of formulation and formulation development considerations	1	19/9/23	T1,T2	PPT
	6	Concept & testing of preformulation & their parameters.	4	20/9/23	T1,T2	PPT
	7	Tablets: compressed, granulation, coatings, pills, capsules	4	21/9/23	T1,T2	PPT
	8	Parental preparations, herbal extracts, Oral liquids, Ointments.	3	22/9/23	T1,T2	PPT
	9	Analytical methods and tests for various drugs, packaging techniques-	1	26/9/23	T1,T2	PPT
	10	Glass containers, plastic containers, film wrapper, bottle seals;	4	27/9/23	T1,T2	PPT
	11	storage and stability of biotech products.	4	29/9/23	T1,T2	PPT
2	1	PHARMACOKINETICS AND PHARMACODYNAMICS: Pharmacodynamics of protein based drugs.	3	3/10/23	T1,T2	PPT
	2	Pharmacokinetics of protein based drugs.	1	4/10/23	T2,T4	PPT
	3	Disease target identification and selection, receptor-based approaches,	4	5/10/23	T2,T4	PPT
	4	agonists, antagonists, enzyme inhibitors Basic concepts,	4	6/10/23	T2,T4	PPT
	5	ADME definitions, Need of pharmacokinetic study,;	3	10/10/23	T2,T4	PPT
	6	Interpretations from pharmacokinetics parameters	1	11/10/23	T2,T4	PPT
	7	Examples of Pharmacodynamic parameters of various drugs;	4	12/10/23	T2,T4	PPT
	8	Evolution of Drug Metabolism Phase I	4	13/10/23	T2,T4	PPT

				19/10/23	R1	PPT
	9	Metabolism microsomal oxidation, hydroxylation, dealkylation study	3	25/10/23	R1	PPT
	10	Phase II Metabolism(Drug conjugation pathway)	1	26/10/23	T3	PPT
	11	CYP Families- case	4	27/10/23	T3.T4	PPT
3	1	PHARMACOTHERAPY Classification of drugs based on therapeutic actions using suitable examples	4		Self Notes	PPT
	2	Special emphasis on Vitamins,	3	31/10/23	Self Notes	PPT
	3	cold remedies, laxatives, analgesics,	1	7/11/23	Self Notes	PPT
	4	non-steroidal contraceptives,	4	8/11/23	Self Notes	PPT
	5	external antiseptics, antacids,	4	9/11/23	Self Notes	PPT
	6	antibiotics, biologicals,	3	10/11/23	Self Notes	PPT
	7	herbal products. Pharmacotherapy of migraine,	1	11/11/23	Self Notes	PPT
	8	cancer, TB	4	15/11/23	R1	PPT
	9	diabetes, male sexual dysfunction	4	16/11/23	R1	PPT
	11	Hormone replacement therapy.	3	17/11/23	R1	PPT
		1	BIO THERAPEUTICS AND STEM CELLS Clinical importance of Therapeutic Proteins and Enzymes:	1	23/11/23	R2,T1
	2	Hormones used as therapeutics	4	24/11/23	R2,T1	PPT
	3	Growth Factors used as therapeutics	4	28/11/23	R2,T1	PPT
	4	erythropoietin & insulin as examples	3	29/11/23	R2,T1	PPT
	5	Interferons, Interleukins,	1	1/12/23	R2,T1	PPT
	6	Preservation and clinical use of blood and blood components,	4	5/12/23	R2,T1	PPT
	7	principles and safety guide lines for blood transfusion.	4	6/12/23	R2,T1	PPT
	8	Advanced Sustained Release,	3	7/12/23	R2,T1	PPT
	8	Advanced drug Delivery Systems:	1	8/12/23	R2,T1	PPT
	9	Liposomes and Nanoparticles	4	9/12/23	R2,T1	PPT
	10	biodegradable drug delivery system (hydrogel based).	4	12/12/23	R2,T1	PPT
	1	CLINICAL RESEARCH: The philosophy behind and organization of clinical research.	3	13/12/23	R3	PPT
	2	Pre-clinical development to support testing in humans:	1	14/12/23	R3	PPT
	3	In vitro and in vivo testing of new compounds,	4	15/12/23	R3	PPT
	4	Relationship between animal and human pharmacology. Safety testing – acute, sub acute	4	19/12/23	R3	PPT
	5	toxicology, immunotoxicology, Concepts of pharmacovigilance,	3	20/12/23	R3	PPT
	6	General principles and guide to data sources,	1	21/12/23	R3	PPT
	7	types of epidemiology study designs, ecological (correlation) studies,	4	22/12/23	R3	PPT
	8	case reports, prevalence surveys or cross- sectional studies,	4	23/12/23	Self notes	PPT
	9	case control studies, Clinical trials-informed consent, Placebo Responses, Clinical	3	26/12/23	Self notes	PPT
					Self notes	PPT



	Registries		1/1/24		PPT
10	Clinical Research Institutes, Data Management, Clinical Research from Pharmaceutical Industry.	1		Self notes	
	Revision	4	2/1/24		
	Revision	4	3/1/24		
	Revision	3	4/1/24		
	Revision	1	5/1/24		

**Self-study topics (not included in syllabus)**

Sl.no.	Self-study topic	Suggested references
1	Clinical Research Institutes	Industrial Pharmaceutical Biotechnology Heinrich Klefenz Wiley-VCH edition 2002

**Assignment topics**

Sl.no.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	25/10/23
2	Assignment from module 2 & 3	20/12/23
3	Assignment from module 4 & 5	2/1/24

**Course Outcomes:**

1. Explain the significance of pharmaco-kinetic models, pharmaco-dynamic principles, various dosage forms and formulation.
2. Understand the specific techniques used in biotherapy & clinical Biotechnology
3. Comprehend specific applications of pharmaceutical & clinical Biotechnology

**Text books:**

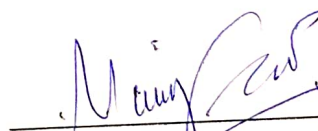
1. Biochemistry and Biotechnology Gary Walsh John Wiley & Sons Ltd 2002
2. Principles and Practice of Clinical Research J. I. Gallin and F. P. Ognibene Elsevier Publication 4th Edition 2017
3. Current Trends in Pharmacology Arunabha Ray & Kavitha Gulati IK Intl 2007
4. An Introduction to Synthetic Drugs Singh & Rangnekar Himalaya publishing House 1980

**Reference Books**

1. Biopharmaceuticals, Biochemistry and Biotechnology Gary Walsh Wiley Pub 1998
2. Principles of Medicinal Chemistry Foye Lippincott Williams & Wilkins Publishers Sixth Edition 2008
3. Industrial Pharmaceutical Biotechnology Heinrich Klefenz Wiley-VCH edition 2002



Faculty

  
**DR. B.K. MUNATHA**  
 Professor & Head  
 Department of Biotechnology  
 The Oxford College of Engineering  
 Bengaluru-560 050



Lesson plan

Date: 20/09/23

Subject code: 18BT 731

Subject title: Process Equipment & Plant design

Semester: VII

Faculty name: Dr. K. Valarmathy

Course/branch: Biotechnology

Academic year: 2023-24 Odd Semester

Objectives of course: The Objective of the course is to

- To understand the basic concepts of flow sheeting, material and energy balances and process development.
- To understand the factors necessary for feasibility of the process.
- To estimate capital investment, total product costs, depreciation, cash flows, and profitability.
- Analyze capital investment based on cash flows and breakeven chart

Prerequisite: Basic knowledge of Bioreactor Engineering and Entrepreneurship.

Unit	Topic no.	Topics planned	Period/T ime	Date	Books referred	Pedagogy
1	1	Design project procedure	11:00 AM	Wed, Sep 20, 2023	1#3-4	PPT
	2	Design information from literature,	09:55 AM	Thu, Sep 21, 2023	1#67-68	PPT
	3	Flow diagrams ,	09:00 AM	Mon, Sep 25, 2023	1#76	PPT
	4	Comparison of different processes and firm process design	09:55 AM	Tue, Sep 26, 2023	1#76	PPT
	5	Tutorial class	11:00 AM	Wed, Sep 27, 2023		PPT
	6	firm process design	09:55 AM	Tue, Oct 03, 2023	1#76	PPT
	7	Equipment design and specialization	11:00 AM	Wed, Oct 04, 2023	1#80-81	PPT
	8	Scale up in design.	09:55 AM	Thu, Oct 05, 2023	1#80-81	PPT
	9	Safety factor specifications ,Materials of construction	09:00 AM	Mon, Oct 09, 2023	1#81-82	PPT
	10	Optimum design and design strategy	09:55 AM	Tue, Oct 10, 2023	1#83	PPT
2	1	Factors involved in project cost estimation,	11:00 AM	Wed, Oct 11, 2023		PPT
	2	Fixed capital investments( land, building equipments and utilities equipment ,instrumentation,piping electrical installment & other utilities.)	09:55 AM	Thu, Oct 12, 2023	#232-246	PPT
	3	Fixed capital investments Manufacturing costs:Direct Production costs( Raw materials, operating supplies, HR)	09:00 AM	Mon, Oct 16, 2023	1#259-268	PPT
	4	Direct production costs ( utilities and royalties)	09:55 AM	Tue, Oct 17, 2023		PPT
	5	Fixed charges ( depreciation, taxes)	11:00 AM	Wed, Oct 18, 2023	1#259-268	PPT



	6	Working capital investments	09:55 AM	Thu, Oct 19, 2023	1#269-270	PPT	
	7	Numericals on capital investments	11:00 AM	Wed, Oct 25, 2023	1#249-258	PPT	
	8	Plant overheads	09:55 AM	Thu, Oct 26, 2023	1#249-258	PPT	
	9	Administration ,safety and other auxillary services	09:00 AM	Mon, Oct 30, 2023	1#270-271	PPT	
	10	Payroll overhead, warehouse and storage facility Ware house and storage facilities	09:55 AM	Tue, Oct 31, 2023	1#270-271	PPT	
	3	1	Cost analysis:Factors involved in project cost estimation	09:55 AM	Thu, Nov 02, 2023	1#279-282	Chalk & Board
		2	Methods employed for estimation of the capital investment	09:00 AM	Mon, Nov 06, 2023	1#282-290	Chalk & Board
		3	Tutorial class	09:55 AM	Tue, Nov 07, 2023	1#282	Chalk & Board
		4	Methods employed for estimation of the capital investment	11:00 AM	Wed, Nov 08, 2023	1#282	Chalk & Board
		5	Methods for estimation of the capital investment	09:55 AM	Thu, Nov 09, 2023	1#282-290	Chalk & Board
6		Estimation of working Capital	09:00 AM	Mon, Nov 13, 2023	1#282-290	Chalk & Board	
7		Estimation of working Capital-numericals	11:00 AM	Wed, Nov 15, 2023	1#282	Chalk & Board	
8		Estimation of working Capital	09:55 AM	Thu, Nov 16, 2023	1#282	Chalk & Board	
9		Estimation of working Capital	09:00 AM	Mon, Nov 20, 2023	1#282	Chalk & Board	
10		Estimation of working Capital	09:55 AM	Tue, Nov 21, 2023	1#282	Chalk & Board	
4	1	Depreciation calculation methods- sum of year digit	11:00 AM	Wed, Nov 22, 2023	1#307-310	Chalk & Board	
	2	Depreciation calculation methods- declining and double declining	09:55 AM	Thu, Nov 23, 2023	1#307-310	Chalk & Board	
	3	Equivalence after taxes	09:00 AM	Mon, Nov 27, 2023	1#310-314	Chalk & Board	
	4	Cost comparison after taxes	09:55 AM	Tue, Nov 28, 2023	1#310-314	Chalk & Board	
	6	Financial statements ,Cash flow diagrams	11:00 AM	Wed, Nov 29, 2023	1#260-261	Chalk & Board	
	7	Break even analysis	09:00 AM	Mon, Dec 04, 2023	1#340-351	Chalk & Board	
	8	Conceptual numericals	09:55 AM	Tue, Dec 05, 2023		Chalk & Board	
	9	Conceptual numericals	11:00 AM	Wed, Dec 06, 2023		Chalk & Board	
	10	Conceptual numericals	09:55 AM	Thu, Dec 07, 2023		Chalk & Board	
	5	1	Methods for the evaluation of profitabilty	09:00 AM	Mon, Dec 11, 2023	1#322-327	Chalk & Board
2		Return on original investment	09:55 AM	Tue, Dec 12, 2023	1#348-351	Chalk & Board	



3	interest rate of return	11:00 AM	Wed, Dec 13, 2023	1#340-346	Chalk & Board
4	Accounting for uncertainty and variations and future developments	09:55 AM	Thu, Dec 14, 2023	1#322-327	Chalk & Board
5	Tutorial class	09:00 AM	Mon, Dec 18, 2023		Chalk & Board
6	Replacements and alternative investment	09:55 AM	Tue, Dec 19, 2023	1#322-327	Chalk & Board
7	Opportunity cost	11:00 AM	Wed, Dec 20, 2023	1#340-351	Chalk & Board
8	Time value of money and equivalence and Numericals	09:55 AM	Thu, Dec 21, 2023	1#290-296	Chalk & Board
9	Conceptual numerical	09:55 AM	Tue, Dec 26, 2023		Chalk & Board
10	Conceptual numerical	11:00 AM	Wed, Dec 27, 2023		Chalk & Board
	Revision- Conceptual numerical	09:55 AM	Thu, Dec 28, 2023		Chalk & Board
	Revision- Conceptual numerical	09:00 AM	Mon, Jan 01, 2024		Chalk & Board
	Revision- Conceptual numerical	09:55 AM	Tue, Jan 02, 2024		Chalk & Board
	Revision- Conceptual numerical	11:00 AM	Wed, Jan 03, 2024		Chalk & Board
	Revision- Conceptual numerical	09:55 AM	Thu, Jan 04, 2024		Chalk & Board
	Revision- Conceptual numerical	09:00 AM	Mon, Jan 08, 2024		Chalk & Board
	Revision- Conceptual numerical	09:55 AM	Tue, Jan 09, 2024		Chalk & Board
	Revision- Conceptual numerical	11:00 AM	Wed, Jan 10, 2024		Chalk & Board
	Revision- Conceptual numerical	09:55 AM	Thu, Jan 11, 2024		
	Revision- Conceptual numerical	09:00 AM	Mon, Jan 15, 2024		
	Revision- Conceptual numerical	09:55 AM	Tue, Jan 16, 2024		
	Revision- Conceptual numerical	11:00 AM	Wed, Jan 17, 2024		
	Revision- Conceptual numerical	09:55 AM	Thu, Jan 18, 2024		

**Self-study topics (not included in syllabus)**

Sl.no.	Self-study topic	Suggested references
1	Distillation column design and costs	Peters and Timmerhaus Coulson and Richardson

**Assignment topics**

Sl.no.	Assignment topic
1	Questions from module 1 & 2
2	Questions from module 3 & 4
3	Case study

Note: All the questions will be based on previous years question papers on the above said topics.

**Course Outcomes:**

At the end of the course the student will be able to

1. Acquire knowledge in the design of process of a chemical plant
2. The students will be able to develop step by step procedure for plant design considering all the types of design procedure
3. Able to evaluate the capital investments, manufacturing cost required for the process plant
4. The students will be capable of analyzing the cost and time value of money


Understand the concept of depreciation, Profitability and taxes

**Text book:**

1. Design and economics for Chemical engineers- Peters and Timmerhaus

**Reference Book:**

1. Chemical Engineering Vol.VI – Coulson J.M and Richardson J.F
2. Joshi M.V - Process Equipment Design 3rd Edn MacMillan India Ltd 1981.

  
Faculty

  
**Dr. B.N. MADHUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.



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**DEPARTMENT OF BIOTECHNOLOGY**

(Approved by AICTE, New Delhi, Accredited by NBA, New Delhi & Affiliated to VTU, Belgaum)

**Subject code:** 18 BT 741

**Subject title:** Bioethics, Biosafety & IPR

**Semester:** V II

**Faculty name:** Dr. Amulya G

**Lesson plan**

**Date:** 11/09/2023

**Course/branch:** Biotechnology

**Academic year:** 2023-24 Odd Semester

**Objective of course:**

1. To introduce the biosafety regulations
2. To understand the ethical concepts in biotechnology
3. To emphasize on IPR issues and need for knowledge in patents in biotechnology

**Prerequisite:** Genetic engineering, plant biotechnology, animal biotechnology and entrepreneurship

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	Introduction to science, technology and society,	2	11/9/23	T1,T4	Chalk and board
	2	issues of access-Case studies/experiences from developed countries	4	12/9/23	T1,T4	Chalk and board
	3	issues of access-Case studies/experiences from developing countries	1	14/9/23	T1,T4	Chalk and board
	4	Ownership	2	15/9/23	T1,T4	Chalk and board
	5	monopoly, traditional knowledge,	2	19/9/23	T1,T4	Chalk and board
	6	biodiversity, benefit sharing,	4	19/9/23	T1,T4	Interaction
	7	environmental sustainability, public vs. private funding.	1	21/9/23	T1,T4	Chalk and board
	8	biotechnology in international relations, globalization and development divide	2	22/9/23	T1,T4	Chalk and board
	9	Public acceptance issues for biotechnology	2	25/9/23	T1,T4	Chalk and board
	10	Biotechnology and hunger	4	26/9/23	T1,T4	Chalk and board
	11	Challenges for the Indian Biotechnological research and industries.	2	29/9/23	T1,T4	Research articles
2	1	Principles of bioethics: Legality, morality		3/10/23	T1,R3	Chalk and board
	2	ethics, autonomy, human rights	2	5/10/23	T1,R3	Chalk and board
	3	beneficence, privacy, justice, equity etc	4	6/10/23	T1,R3	Chalk and board
	4	The expanding scope of ethics from biomedical practice to biotechnology	1	9/10/23	T1,R3	Chalk and board
	5	bioethics vs. business ethics	2	10/10/23	T2	Chalk and board
	6	ethical dimensions of IPR	2	12/10/23	T1,R3	Chalk and board
	7	The legal, institutional impacts of biotechnology	4	13/10/23	R2	Chalk and board
	8	socioeconomic impacts of biotechnology	1	19/10/23	Self notes	Interaction
	9	biotechnology and social responsibility	1	26/10/23	T1,R3	Chalk and board
	10	Public education to increase the awareness of bioethics with regard to generating new forms of life	2	27/10/23	R	Live examples
	11	generating new forms of life for informed decision making – with case studies.	2	30/10/23	T1,R3	Chalk and board
3	1	Ethical conflicts in biotechnology -	4	31/10/23	T3.T4	Chalk and board
	2	Case studies on ethical conflicts	1	31/10/23	Self notes	Recent articles
	3	interference with nature, fear of unknown	1	2/11/23	T2, T3	Chalk and board



	4	unequal distribution of risks and benefits of biotechnology	2	3/11/23	T2, T3	Chalk and board
	5	relationship between risk, hazard	2	6/11/23	T2, T3	Chalk and board
	6	exposure and safeguards	4	7/11/23	T2, T3	Chalk and board
	7	Biotechnology and biosafety concerns at the level of individuals, institutions, society,	1	9/11/23	T2, T3	Chalk and board
	8	Biotechnology and biosafety concerns at the level of region, country and the world.	2	10/11/23	T2, T3	Chalk and board
	9	The Cartagena protocol on biosafety.	2	11/11/23	T2, T3	Chalk and board
	11	Biosafety management	2	13/11/23	Self notes	Live examples and interaction
	11	Ethical implications of biotechnological products and technique	2	13/11/23	Self notes	Chalk and board
	1	Biosafety assessment procedures in India	1	16/11/23	T2, T4	Chalk and board
	2	Biosafety assessment procedures in abroad	2	17/11/23	T2, T4	Chalk and board
	3	International dimensions in biosafety, bioterrorism and convention on biological weapons	1	23/11/23	R2	Chalk and board
	4	Social and ethical implications of biological weapons	2	24/11/23	T2, T4	Chalk and board
	5	Biosafety regulations in India and guidelines with regard to recombinant DNA technology.	2	27/11/23	T2, T4	Present situation discussion
	6	Biosafety regulations and international guidelines with regard to recombinant DNA technology.	4	28/11/23	T2, T4	Present situation discussion
4	7	Guidelines for research in transgenic plants.	2	01/12/23	Self notes	Chalk and board
	8	Good manufacturing practice (GMP)	2	4/12/23	T2, T4	Chalk and board
	8	Good lab practices (GLP)	4	5/12/23	T2, T4	Chalk and board
	9	National regulations for food and pharma products.	1	7/12/23	T2, T4	Chalk and board
	10	international regulations for food and pharma products.	2	8/12/23	R3	Chalk and board
	1	Intellectual property rights	2	11/12/23	R1, T2, T3	Chalk and board
	2	TRIP- GATT	4	12/12/23	R1, T2, T3	Chalk and board
	3	International conventions patents	1	14/12/23	T1	Chalk and board
	4	Methods of application of patents and Legal implications	2	15/12/23	T2, T3	Chalk and board
	5	Biodiversity and farmer rights	2	18/12/23	T2, T3	Chalk and board
	6	Objectives of the patent system	4	19/12/23	R1	Chalk and board
5	7	Basic principles and general requirements of patent law	1	21/12/23	T2, T3	Chalk and board
	8	Biotechnological inventions and patent law	2	22/12/23	R1, T3	Chalk and board
	9	Legal development-Patentable subjects and protection in biotechnology	2	23/12/23	Self notes	Interaction
	10	The patenting of living organisms.	4	26/12/23	Self notes	Interaction
		Revision	2	01/1/24		Interaction
		Revision	4	2/1/24		Interaction
		Revision	1	4/1/24		Interaction
		Revision	2	5/1/24		Interaction

### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Patent drafting, Prior Artsearch, case study of pharma product Dolo650, certificate course workshop on IPR	Biosafety Management, P.L. Traynor, Virginia polytechnic Institute Publication,1999.

### Assignment topics

Sl.no.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	22/10/23
2	Assignment from module 3 & 4	19/12/23
3	Assignment from module 5	01/1/24

### Course Outcomes:

1. Describe the rules governing manufacture, use/import/export and storage of hazardous microorganisms/genetically engineered organisms or cells.
2. Describe the ethical issues related to biotechnology research.
3. Explain the various forms of IPR, methods of application of Patents, Protection of Plant varieties and farmer rights.
4. Overview of the Indian Patent Law, knowledge on patentability requirements, patenting biotechnological inventions and innovations.

### Text books:

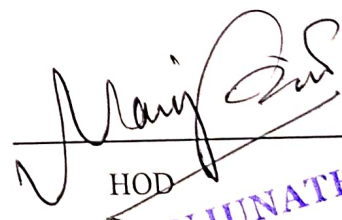
1. Biotechnology and Safety Assessment, Thomas J.A., Fuch R.L, Academic Press,3rd Edition 2002
2. Biological safety Principles and practices, Fleming D.A.,Hunt D.ASM Press,3rd. ed. 2000
3. Bioethics, Ben Mephram, Oxford University Press, 2008
4. Bioethics & Biosafety,R Rallapalli & Geetha Bali, APH Publication, 2007

### Reference Books

1. Bioethics & biosafety, Sateesh MK, IK Publishers, 2008.
2. Biological Warfare in the 21st century, M.R. Dando, Brassies London,1994.
3. Biosafety Management, P.L. Traynor, Virginia polytechnic Institute Publication,1999.



Faculty



HOD  
**Dr. B.K. MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
Oxford College of Engineering  
Bengaluru-560 068.





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**Lesson plan**

**Subject code:** 18 ME 751  
**Subject title:** Energy and Environment  
**Semester:** VII  
**Faculty name:** P.Tamizharasi

**Date:** 06/02/2024  
**Course/branch:** Biotechnology  
**Academic year:** 2023-24 Odd Semester

**Objective of course:**

1. To understand the fundamental energy sources, energy use, energy efficiency, and resulting environmental implications of various energy supplies.
2. To introduce various aspects of environmental pollution and its control.
3. To understand the causes and remedies related to social issues like global warming, ozone layer depletion, climate change etc.
4. To introduce various acts related to prevention and control of pollution of water and air, forest protection act, wild life protection act etc.

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	Energy and power, forms of energy	1	21/09/23	T1(3-6)	PPT and Board
	2	Primary energy sources, energy flow	2	22/09/23	T1(7-12)	PPT and Board
	3	World energy production and consumption	4	25/09/23	T1(14-32)	PPT and Board
	4	Key energy trends in India	2	27/09/23	T1(42-55)	PPT and Board
	5	Demand, Electricity	1	30/09/24		PPT and Board
	6	Access to modern energy	2	04/10/24	T2(124-132)	PPT and Board
	7	Energy production and trade	2	18/10/24	T2(134-144)	PPT and Board
	8	Factors affecting India's energy development	1	20/10/24	T2(146-164)	PPT and Board
	9	Economy and demographics Policy	4	30/10/24	T2(164-182)	PPT and Board
	10	Institutional framework	2	31/10/24	T2(184-210)	PPT and Board
2	1	Thermal energy storage method	1	06/11/24	T1(3.1-4.6)	PPT and Board
	2	Energy saving	2	07/11/24	T1(3.1-4.6)	PPT and Board
	3	Thermal energy storage system	4	10/11/24	T2(207-209)	PPT and Board
	4	Thermal energy storage systems method	1	15/11/24	T1(5.1-5.59)	PPT and Board
	5	Principles of Energy Management	2	16/11/24		PPT and Board
	6	Energy demand estimation	4	17/11/24	T2(207-209)	PPT and Board
	7	Energy pricing	1	24/11/24	T2(207-209)	PPT and Board
	8	Energy Audit: Purpose, Methodology with respect to process Industries	2	27/11/24	T2(310-320)	PPT and Board
	9	Characteristic method employed in Certain Energy Intensive Industries	4	27/11/24	T2(325-334)	PPT and Board
3	1	Introduction of Environment	2	5/12/24	E-Source	PPT and Board
	2	Multidisciplinary nature of environmental studies- Definition, scope and Importance	4	6/12/24	E-Source	PPT and Board
	3	Need for public awareness	2	7/12/24	E-Source	PPT and Board
	4	Ecosystem: Concept	1	8/12/24	E-Source	PPT and Board
	5	Energy flow	1	9/12/24	E-Source	PPT and Board
	6	Structure and function of an ecosystem	2	11/12/24	E-Source	PPT and Board
	7	Structure and function of an food chain	4	12/12/24	E-Source	PPT and Board
	8	Food web	2	13/12/24	Self notes	PPT and Board
	9	Ecological pyramid	1	15/12/24	Self notes	PPT and Board
	11	Forest ecosystem	2	18/12/24	Self notes	PPT and Board
	1	Definition, Cause, effects and control	4	18/12/24	T3(184-185)	PPT and Board



4		measures of - Air pollution	2	19/12/24	T3(186-188)	PPT and Board
	2	Water pollution	2	19/12/24	T3 (195-200)	PPT and Board
	3	Soil pollution	1	20/12/24	T3(189-192)	PPT and Board
	4	Environmental Pollution	2	20/12/24	T3(189-192)	PPT and Board
	5	Marine pollution	4	21/12/24	T3(195-194)	PPT and Board
	6	Noise pollution	2	21/12/24	T3 (210-215)	PPT and Board
	7	Thermal pollution	2	21/12/24	Self notes	PPT and Board
	8	Nuclear hazard	2	22/12/24	T3(201-207)	PPT and Board
	8	Solid waste Management	1	22/12/24	T3(201-207)	PPT and Board
	9	Pollution case studies	2	22/12/24	T3(210-215)	PPT and Board
5	10	Disaster management	2	23/12/24	T4(383-386)	PPT and Board
	1	Introduction of social issues and the environment	4	23/12/24	Self notes	PPT and Board
	2	Climate change	2	23/12/24	Self notes	PPT and Board
	3	Global warming	1	24/12/24	T2(168,394)	PPT and Board
	4	Acid rain	2	24/12/24	T4 exercise	PPT and Board
	5	Ozone layer depletion	4	26/12/24	T4(108-119)	PPT and Board
	6	Nuclear accident	2	26/12/24	T4(108-119)	PPT and Board
	7	Holocaust	1	28/12/24	T4(110), T4(108-119)	PPT and Board
	8	Case Studies. Wasteland reclamation	2	28/12/24	T4(120-136)	PPT and Board
	9	Consumerism and waste product	4	30/12/24	T4(120-136)	PPT and Board
	10	Environment Protection Act	2	30/12/24		PPT and Board
		Revision-module 1	2	04/01/24		PPT and Board
		Revision-module-2	2	05/01/24		PPT and Board
		Revision-module-3	1	06/01/24		PPT and Board
		Revision-module-4	2	08/01/24		PPT and Board
		Revision-module-5	4	10/01/24		PPT and Board

#### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Delhi Pollution Case Study	T1

#### Assignment topics

Sl.no.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	10/11/23
2	Assignment from module 2 & 3	01/12/23
3	Assignment from module 4 & 5	02/01/24

#### Course Outcomes:

- Understand energy scenario, energy sources and their utilization.
- Understand various methods of energy storage, energy management and economic analysis.
- Analyses the awareness about environment and eco system.
- Understand the environment pollution and how to overcome
- Understand social issues and acts.

#### Text books:

1. Energy Management Handbook, Turner W C
2. Energy Management Audit and Conservation, De. B K
3. Textbook for Environmental Studies, Bharathi Vidyapeeth Institute
4. Environmental Studies, Benny Joseph

#### Reference Books:

1. Environment pollution control engineering, C S Rao

*P. Ishi*  
Faculty

(P. Tamizharasi)

*Manjunatha*  
HOD  
**DR. B.K. MANJUNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.



**Lesson plan**

Date: 30/05/2023

**Subject code:** 21BT44

**Subject title:** Molecular biology & genetic engineering Course/branch: Biotechnology

**Semester:** IV

**Academic year:** 2022-23 Even Semester

**Faculty name:** Dr. Amulya G

**Objective of course:**

1. To Acquire the fundamentals of molecular biology and genetic engineering principles.
2. To Understand the protocols of isolation of Nucleic acids and their analysis.
3. To Develop a conceptual application of gene libraries and various interactions.
4. To Learn the strategies for gene manipulation, editing technologies and its applications.

**Prerequisite:** Cell biology and basic concepts of biology

Unit	Topic no.	Topic	Period	Date	Books referred	Pedagogy
1	1	Replication of DNA in Prokaryotic cell	1	05/06/23	T4(1.1-1.46)	Chalk and Board, PPT
	2	Replication of DNA in Eukaryotic cell	1	08/06/23	T4(1.1-1.46)	Chalk and Board, PPT
	3	Mechanism of action of telomerase, DNA damage	2	09/06/23	T4(1.1-1.46)	Chalk and Board, PPT
	4	DNA repair: Base excision repair, mismatch excision repair	4	09/06/23	T4(1.1-1.46)	Chalk and Board, PPT
	5	photo-reactivation, nucleotide excision, and SoS repair.	1	12/06/23	T4(1.1-1.46)	Chalk and Board, PPT
	6	Transcription in the prokaryotic cell	1	15/06/23	T4(1.51-1.113)	Chalk and Board, PPT
	7	Transcription in the prokaryotic and eukaryotic cell: Initiation, elongation	2	16/06/23	T4(1.51-1.113)	Chalk and Board, PPT
	8	Transcription termination. Processing of mRNA.	4	16/06/23	T4(1.51-1.113)	Chalk and Board, PPT
	9	Translation in the prokaryotic and eukaryotic cell: Initiation, elongation	1	19/06/23	T4(1.51-1.113)	Chalk and Board, PPT
	10	Translation termination. Wobble Hypothesis	1	22/06/23	T4(1.51-1.113)	Chalk and Board, PPT
	11	Post-translational modification of proteins. Protein targeting.	2	23/06/23	T4(1.51-1.113)	Interaction study
2	1	Regulation of gene expression in prokaryotes (lac-operon and trp operon)	4	23/06/23	T4(1.122-1.159)	Chalk and Board, PPT
	2	Positive and negative gene regulation, riboswitches	1	26/06/23	T4(1.122-1.159)	Chalk and Board, PPT
	3	Regulation of gene expression in eukaryotes	2	30/06/23	T4(1.122-1.159)	Chalk and Board, PPT
	4	Transcriptional control, RNA processing control	4	30/06/23	T4(1.122-1.159)	Chalk and Board, PPT
	5	Translational control, and post-translational level control	1	01/07/23	T4(1.122-1.159)	Chalk and Board, PPT
	6	post-translational level control	1	03/07/23	T4(1.122-1.159)	Case - studies
	7	Hormonal control of gene expression in eukaryotes (steroid hormone).	1	06/07/23	T4(1.122-1.159)	Chalk and Board, PPT
	8	Hormonal control of gene expression in eukaryotes (auxin, and gibberellic acid).	2	07/07/23	T4(1.122-1.159)	Chalk and Board, PPT
	9	Gene silencing	4	07/07/23	T4(1.122-1.159)	Chalk and Board, PPT



	10	antisense technique				
	11	RNA interference, Ribozymes.	2	13/07/23	T4(1.122-1.159)	Chalk and Board, PPT
3	1	Basics of Genetic Engineering,	2	14/07/23	T4(1.122-1.159)	Research articles study
	2	Vectors for gene cloning: Cloning and Expression vectors.	4	14/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	3	Plasmids, Phages, Cosmids, Fosmids, Phagemids	1	17/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	4	Artificial chromosomes. Viral vectors.	3	17/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	5	Molecular tools for gene cloning: Restriction and Modification systems: Restriction Endonucleases	1	20/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	6	Methylases, Ligases. Polynucleotide kinases, Phosphatases, DNA and RNA polymerases, Reverse transcriptase,	2	21/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	7	Terminal transferase, DNAses (Extremophiles), Nuclease. RNases, Topoisomerase.	4	21/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	8	Cloning Techniques: Restriction digestion based cloning.	1	24/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	9	Linkers and adapters,	1	27/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	10	Strategies for cloning TA cloning. Ligase free cloning	2	28/07/23	Self notes	Chalk and Board, PPT
4	1	Physical, chemical	4	28/07/23	T1(3.1-3.2)	Chalk and Board, PPT
	2	biological methods of gene transfer	1	31/07/23	T3(14-83)	Chalk and Board, PPT
	3	Competent cells: Chemical and Electro-competent.	1	03/08/23	Self notes	Practical Based session
	4	Transformation/ transfection in plants and animals.	2	04/08/23	T3(14-83)	Chalk and Board, PPT
	5	Construction of genomic and cDNA libraries	4	04/08/23	T3(14-83)	Chalk and Board, PPT
	6	Screening of DNA libraries for clone identification.	1	07/08/23	T3(14-83)	Chalk and Board, PPT
	7	Characterization of clones. Methods of nucleic acid detection	1	10/08/23	T3(14-83)	Chalk and Board, PPT
	8	Polymerase chain reaction (PCR) - techniques and requirements	2	11/08/23	T3(14-83)	Chalk and Board, PPT
	8	types of PCR, applications.	4	11/08/23	T3(213-298)	Real Time Experimentation
	9	Blotting techniques (Southern, Northern and Western),	1	12/08/23	T3(213-298)	Chalk and Board, PPT
5	9	Blotting techniques (Southern, Northern and Western),	1	14/08/23	T3(213-298)	Real Time Experimentation
	10	Radioactive and non radioactive labelling of nucleic acids.	1	21/08/23	T3(213-298)	Chalk and Board, PPT
	1	Engineering microbes for the production of antibiotics and enzymes	1	24/08/23	T2(383-386)	Chalk and Board, PPT
	2	Engineering microbes for the production of, insulin and monoclonal antibodies.	4	24/08/23	T3(213-298)	Chalk and Board, PPT
	3	Transgenic technology for plant and animal improvement,	2	25/08/23	T2(168,394)	Chalk and Board, PPT
	4	Over expression and Knock out	4	25/08/23	T4 exercise	Chalk and Board, PPT
	5	knock down studies, RNAi	1	28/08/23	T4(108-119)	Chalk and

					Board, PPT
	Bio pharming- plants as bioreactors for recombinant proteins	4	28/08/23	T4(108-119)	Chalk and Board, PPT
7	Bio pharming- Animals as bioreactors for recombinant proteins	1	31/08/23	T4(110), T4(108-119)	Chalk and Board, PPT
8	Genome-Editing Technologies: Types, Principles and Applications;	2	01/09/23	T4(120-136)	Chalk and Board, PPT
9	CRISPR- associated protein – Cas 9.	4	01/09/23	T4(120-136)	Chalk and Board, PPT
10	CRISPR- associated protein – Cas 9.	1	04/09/23		Research Articles.
	Revision-module 1	1	07/09/23		Interaction
	Revision-module-2	2	08/09/23		Interaction
	Revision-module-3	4	08/09/23		Interaction
	Revision-module-4	1	09/09/23		Interaction
	Revision-module-5	1	14/09/23		Interaction

#### Self-study topics (not included in syllabus)

Sl.no.	Self-study topic	Suggested references
1	Design expression and interaction of genes and proteins: strategies for gene cloning and gene editing	Genes to Genomes, Concepts and applications of DNA Technology. Jeremy W. Dale and MV Schantz. 2nd edition, 2018.

#### Assignment topics

Sl.no.	Assignment topic	Submission due on
1	Assignment from module 1 & 2	03/07/23
2	Assignment from module 3 & 4	07/08/23

#### Course Outcomes:


- Understand the basic concepts of genetic engineering for augmentation of traits.
- Apply and comprehend the principles of gene manipulation, expression and interaction of genes and proteins.
- Evaluate the screening and interaction studies using classical/conventional and high through put methods.
- Design the strategies for gene cloning and gene editing.

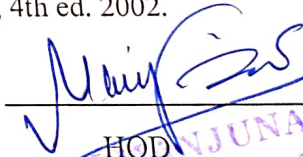
#### Text books:

1. Gene Cloning and DNA Analysis – An Introduction; T.A.Brown; Wiley-Blackwell Science; 7th edn;2018.
2. From Genes to Genomes, Concepts and applications of DNA Technology. Jeremy W. Dale and MV Schantz. 2nd edition, 2018.
3. Lewin's genes XII Burlington, Massachusetts: Krebs, Jocelyn E., Goldstein, Elliott S., Kilpatrick, Stephen T., Jones & Bartlett Learning, 2018.
4. Molecular Biotechnology – Principles and applications of recombinant DNA, B.R. Glick, J.J. Pasternak and C.L Patten; ASM Press; 6th edn; 2017.

#### Reference Books

1. Cell biology by Verma and Agarwal
2. Cell and molecular biology. EDPDe Robertis, EMF De Robertis, Lea &. Febiger Intl. ed.1991.
3. Molecular Biology of the Cell, B. Alberts, et al., Garland Science, 4th ed. 2002.

  
Faculty

  
HOD  
Dr. B.K. MANJUNATHA  
Professor & Head  
Department of Biotechnology  
College of Engineering  
2068





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**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF BIOTECHNOLOGY**

Hosur Road, Bommanahalli, Bengaluru-560 068

(Approved by AICTE, New Delhi, Accredited by NAAC, New Delhi & Affiliated to VTU, Belgaum)

**LESSON PLAN**

**Subject title:** Bioinformatics  
**Course/branch:** Biotechnology  
**Academic year:** 2023 (EVEN)

**Subject code:** 18BT63  
**Semester:** VI  
**Faculty name:** Ms. Salma Kausar.M

**Objective of course:**

- To use online resources, databases related to biological data.
- To learn the underlying concepts of Bioinformatics
- To learn the various tools in bioinformatics to manipulate and analyze biological data

**Prerequisite:** Basic Biology and Mathematics

UNIT	TOPIC NO.	NAME OF THE TOPIC	PERIOD	DATE	BOOKS REFERRED
1	1	Introduction to Bioinformatics	3	2023-03-20	3-8 T1, 87-97 T2
	2	Primary Databases	5	2023-03-21	Self notes
	3	Secondary Databases, Format of Database, Genome Database	3	2023-03-23	Self notes
	4	Introduction to sequence alignment	5	2023-03-24	5-21 T2
	5	Substitution Matrices, PAM, BLOSUM	3	2023-03-27	Self notes
	6	Gap Penalties, database similarity searching, FASTA	5	2023-03-28	
	7	BLAST, low complexity regions	3	2023-03-30	Self notes
	8	MSA, progressive alignment methods, CLUSTAL W	5	2023-03-31	31-40 T1, 296-297 T2
	9	Motifs, patterns, Prosite, 3DPSSM	3	2023-04-03	41-47 T1, 298-303 T2
	10	MeMe, PSI-BLAST, PHI-BLAST, PRATT	5	2023-04-06	51-57 T1, 304-311 T2
	11	Hidden Markov Model, Threading methods	3	2023-04-10	57-61 T1, 315-319 T2
2	1	Introduction to phylogenetic, rooted and unrooted trees, elements of phylogenetic models.	5	2023-04-11	127-131 T1
	2	Phylogenetic data analysis-alignment, substitution, model building tree building and tree evaluation.	3	2023-04-13	373-382 T2
	3	Tree building methods-distance based	5	2023-04-17	142-160 T1
	4	Evaluating trees and data-bootstrapping	3	2023-04-18	
	5	Phylogenetic soft-wares	5	2023-04-20	384 T2, 167 T1
	6	Bioinformatics tools and automation in Genome Sequencing, analysis of Raw genome sequence data	3	2023-04-21	Self notes
	7	Utility of EST database in sequencing, Bioinformatics in detection of Polymorphisms, SNPs	5	2023-04-24	Self notes
	8	Bioinformatics tools in microarray data analysis, tools for comparative genomics, genome annotation problem	3	2023-04-25	Self notes
	9	Tools for comparative genomics: BLAST2, AVID, Vista, COG VOG.	5	2023-04-27	Self notes
	10	Genetic algorithm and neural network	3	2023-04-28	Self notes
3	1	Predictive methods using nucleotide sequence-masking DNA,	3	2023-05-02	Self notes
	2	Database searches, Codon Bias Detection	5	2023-05-04	113-123 T1, self notes
	3	Detecting Functional Sites in the DNA	3	2023-05-05	Self notes

4	Integrated Gene Parsing,	5	2023-05-08	Self notes
5	finding RNA Genes. Web based tools	3	2023-05-09	200-20711
6	Predictive Methods using Protein sequences	5	2023-05-11	214-22911
7	Protein Identity based on composition,	3	2023-05-12	Self notes
8	Physical properties Based on sequence	5	2023-05-15	Self notes
9	Secondary structure and folding classes	3	2023-05-16	Self notes
10	Tertiary structure. Related web based software	3	2023-05-18	Self notes
1	Concepts in Molecular Modeling, Coordinate Systems	5	2023-05-19	R1 (1-24)
2	Concept of energy minimization	4	2023-05-22	R1 (353)
3	Different types of interactions and formulation of force fields	5	2023-05-23	Self-notes
4	Basic MD algorithm, its limitations	4	2023-05-25	R1 (491-492)
5	treatment of long-range forces.	5	2023-05-26	E-notes
6	Comparative modeling	5	2023-05-29	R1 (539-541)
7	Constructing an initial model, refining the model, manipulating the model	4	2023-05-30	R1 (542-544)
8	Molecular superposition and structural alignment	5	2023-06-01	Self-notes
9	Structure Visualization: small molecules (low molecular weight-peptides, nucleotides, disaccharides, simple drugs molecules)	4	2023-06-02	Self-notes
10	Macromolecules (high molecular weight molecules-proteins, DNA, RNA, membranes).	4	2023-06-05	Self-notes
11	Usages of visualization software available in public domain like VMD,	4	2023-06-06	e-notes
12	Pymol andRasmol,	5	2023-06-08	e-notes
13	SpdbViewer, and Cn3D	5	2023-06-09	R1 (353)
1	Restriction mapping. Utilities, DNA strider	4	2023-06-12	e-notes
2	MacVector and OMIGA	4	2023-06-13	e-notes
3	gene construction KIT	5	2023-06-15	e-notes
4	Vector NTI, Web based tools (MAP, REBASE)	4	2023-06-16	e-notes
5	Primer design-need for tools	5	2023-06-19	Self-notes
6	Primer design programs and software (PRIME3).	4	2023-06-20	Self-notes
7	Molecular modeling in drug discovery	5	2023-06-22	Self-notes
8	Molecular docking, quantitative structure-activity relationship (QSAR)	4	2023-06-23	Self-notes
9	Deriving the Pharmacophoric Pattern	5	2023-06-26	E-notes
10	Ligand-Receptor Interactions	4	2023-06-27	Self- notes
11	Docking softwares (AUTODOCK, HEX)	4	2023-06-27	R1 (661-667)
12	Energy Calculations (no derivation), Conceptual numericals	5	2023-06-30	R1 (563-569)
	Tutorial	5	2023-06-30	

Self-study topics(not included in syllabus)		Suggested references
Sl.no.	Self-study topic	Genome by T A Brown
1	Methods used in macromolecular sequence	Bioinformatics- Andreas D Baxeavanis
2	Tools used for comparative Genomics	

Assignment topics		Submission due on
Sl.no.	Assignment topic	2023-05-04
1	Assignment1	2023-06-27
2	Assignment2	

Course Outcomes: After studying this course, students will able to



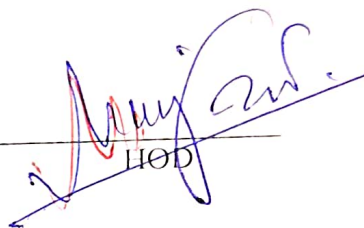
- Know the relevant online resources, databases and software tools.
- Analyse biological data using phylogenetic, predictive and comparative methods
- Apply alignment and modelling tools
- Design in silico various biomolecules.
- Familiarize with tools and techniques of bioinformatics and they can apply these techniques to Health care and pharmacy industry.

**Text books:**

1. Essential Bioinformatics-Jin Xiong
2. Bioinformatics- Andreas D Baxevanis
3. Molecular Modeling and Drug design- K Anand Solomon



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**DEPARTMENT OF BIOTECHNOLOGY**  
 Hosur Road, Bommanahalli, Bengaluru-560 068  
 (Approved by AICTE, New Delhi, New Delhi & Affiliated to VTU, Belgaum)

**LESSON PLAN**

**Subject title:** Universal Human Values  
**Course/branch:** Biotechnology  
**Academic year:** 2022-23 (Even Semester)

**Subject code:** 21UHV49  
**Semester:** IV  
**Faculty name:** Dr. Salma Kausar M

**Objectives of Course:**

This introductory course input is intended:

1. To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.

**Prerequisite:** Basic knowledge of structure modelling and software

Module	Topic no.	Topics planned	Period	Date	Books ref. & page no.
1	1	Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education)	6	Fri, Jun 09, 2023	R1 (1-24)
	2	Understanding Value Education, Self-exploration as the Process for Value Education	6	Fri, Jun 16, 2023	Self-notes
	3	Continuous Happiness and Prosperity – the Basic Human Aspirations	6	Fri, Jun 23, 2023	Self-notes
2	4	Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations	6	Fri, Jun 30, 2023	Self-notes
	5	Understanding Human being as the Co-existence of the Self and the Body	6	Fri, Jul 07, 2023	Self-notes
	6	Distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self	6	Fri, Jul 14, 2023	Self-notes
	7	Understanding Harmony in the Self	6	Fri, Jul 21, 2023	Self-notes
3	8	Harmony in the Family – the Basic Unit of Human Interaction	6	Fri, Jul 28, 2023	Self-notes
	9	'Trust' – the Foundational Value in Relationship,	6	Fri, Aug 04, 2023	Self-notes
	10	'Respect' – as the Right Evaluation, Other Feelings, Justice in Human-to-Human Relationship	6	Fri, Aug 11, 2023	Self-notes
4	11	Understanding Harmony in the Society, Vision for the Universal Human Order	6	Fri, Aug 25, 2023	Self-notes
	12	Understanding Harmony in the Nature, Interconnectedness	6	Fri, Sep 01, 2023	Self-notes
	13	self-regulation and Mutual Fulfilment among the Four Orders of Nature	6	Fri, Sep 08, 2023	Self-notes

	14	Realizing Existence as Co-existence at All Levels	6	Fri, Sep 08, 2023	Self-notes
	15	The Holistic Perception of Harmony in Existence	6	Fri, Sep 15, 2023	Self-notes
5	16	Production Systems and Management Models-Typical Case Studies	6	Fri, Sep 15, 2023	Self-notes
	17	Strategies for Transition towards Value-based Life and Profession	6	Fri, Sep 15, 2023	Self-notes

#### Self-study Topics (Out -of- Syllabus)

Sl. No.	Self-study Topics	Suggested Reference
1	Methods used in macromolecular sequence	T1

#### Assignment Topics

Sl. No.	Assignment Topics	Submission due on
1	Assignment from module 1 and 2	18/05/22
2	Assignment from module 4 and 5	07/07/22

#### Course outcomes:

After studying this course, students will able to

**CO1:** Understand and analyze the essentials of human values and skills, self exploration, happiness and prosperity.

**CO2:** Evaluate coexistence of the "I" with the body.

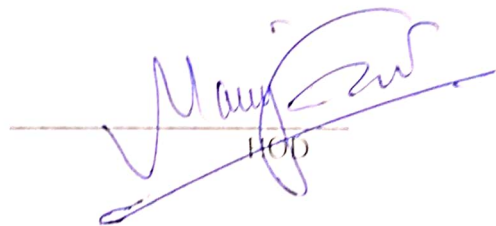
**CO3:** Identify and evaluate the role of harmony in family, society and universal order.

**CO4:** Understand and associate the holistic perception of harmony at all levels of existence.

**CO5:** Develop appropriate technologies and management patterns to create harmony in professional and personal lives.



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**Subject Title:** Food Process Engineering

**Subject code:** 18BT641

**Course/Branch:** B.E/Biotechnology

**Semester:** VI

**Faculty name:** Ms. S. Mira chares

**Academic year:** 2022-2023 (EVEN)

**Course Objectives:**

The objective of this course is to

- Learn about the physiological characteristics of food
- Understand the role of organisms in food preservation, spoilage, and preservation.
- Analyze food sample for microbial contamination.

Module	Topic no.	Topics planned	Period	Date	Books ref. & page no.
1	1	Introduction, history	1	21.3.2023	PPT/ E-notes
	2	Constituents of food, Regulation of food intake colloidal systems in food,	2	23.3.2023	PPT/ E-notes
	3	stability of colloidal systems	2	24.3.2023	PPT/ E-notes
	4	Carbohydrates, Starches	5	25.3.2023	PPT/ E-notes
	5	Proteins, fats, sugars	1	28.3.2023	PPT/ E-notes
	6	Minerals, aroma compounds and flavour	2	29.3.2023	PPT/ E-notes
	7	Browning reactions, antinutritional factors, rancidity and factors	2	30.3.2023	PPT/ E-notes
	8	Metabolism and starvation, malnutrition	5	31.3.2023	PPT/ E-notes
	9	Diet and nutrition in India	1	4.4.2023	PPT/ E-notes
	10	Food faddism and faulty food habits	2	5.4.2023	PPT/ E-notes

2	1	Intrinsic and extrinsic factors influencing growth of microorganism	2	6.4.2023	PPT/ E-notes
	2	Primary source of microorganism in food	5	7.4.2023	PPT/ E-notes
	3	Common food-borne bacteria, molds, yeasts, food-borne infections and intoxication	1	11.4.2023	PPT/ E-notes
	4	Food borne gastroenteritis by Salmonella, Shigella, listeria, Staphylococcus, Clostridium, Vibrio, Yersinia	2	12.4.2023	PPT/ E-notes
	5	Camphylobacter microbial detection in food: culture, microscopic & sampling methods	2	13.4.2023	PPT/ E-notes
	6	Conventional SPC, Membrane filters	5	18.4.2023	PPT/ E-notes
	7	Microscopic colony counts, agar droplets, dry films	1	19.4.2023	PPT/ E-notes
	8	Most probable nos (MPN). Dye-reduction	2	20.4.2023	PPT/ E-notes
	9	Roll tube, microscopic count (DMC)	2	21.4.2023	PPT/ E-notes
3	1	Fermented food-Production of bread	5	25.4.2023	PPT/ E-notes
	2	Production of cheese and sauerkraut	1	26.4.2023	PPT/ E-notes
	3	Fermentation of wines	2	27.4.2023	PPT/ E-notes
	4	Distilled liquor, vinegar	2	28.4.2023	PPT/ E-notes
	5	Fermented dairy products,	5	5.5.2023	PPT/ E-notes
	6	Principles underlying preservation of food	1	9.5.2023	PPT/ E-notes

	7	Food preservation using chemical preservatives	2	10.5.2023	PPT/ E-notes
	8	Irradiation, high temperature	2	11.5.2023	PPT/ E-notes
	9	Low temperature and dehydration	5	12.5.2023	PPT/ E-notes
4	1	Characteristics of food industry	1	16.5.2023	PPT/ E-notes
	2	Food manufacturing and processing	2	17.5.2023	PPT/ E-notes
	3	Objectives, effect of food processing on constituents	2	18.5.2023	PPT/ E-notes
	4	Nutritional value, labeling of constituents	5	19.5.2023	PPT/ E-notes
	5	Nutritional food supplements	1	23.5.2023	PPT/ E-notes
	6	Food packaging, edible films	2	24.5.2023	PPT/ E-notes
	7	Food product development, marketing, promotional strategies	2	25.5.2023	PPT/ E-notes
	8	Application of biotechnology in food industry, nutraceuticals, flavonoids	5	26.5.2023	PPT/ E-notes
	9	Vitamins, enzymes in food industry	1	30.5.2023	PPT/ E-notes
	10	Enzyme generation of flavour and aroma compounds	2	31.5.2023	PPT/ E-notes
	1	Properties of food and processing theory Process control	2	1.6.2023	PPT/ E-notes
	2	Raw material Processing	5	2.6.2023	PPT/ E-notes



5	3	Thermal properties of frozen foods, prediction of freezing rates	1	6.6.2023	PPT/ E-notes
	4	Food freezing equipments: air blast freezers, plate freezers, immersion freezers	2	6.6.2023	PPT/ E-notes
	5	Food dehydration: estimation of drying time, constant rate period, falling rate period	2	7.6.2023	PPT/ E-notes
	6	Equipments: fixed tray dehydration, cabinet drying, tunnel drying	5	7.6.2023	PPT/ E-notes
	7	Equipments related to pulping	1	8.6.2023	PPT/ E-notes
	8	fruit juice extraction, dehulling, distillation	2	8.6.2023	PPT/ E-notes
	9	Food safety (HACCP and FSO system), GMP	2	9.6.2023	PPT/ E-notes
	10	Current technology and future scope	5	9.6.2023	PPT/ E-notes

### Self-study Topics (Out-of- Syllabus)

Sl. No.	Self-study Topics	Suggested Reference
1	Future scope of food industries	Nptel videos

### Assignment Topics

SL.NO	DATE	TOPICS

1 <sup>st</sup> assignment	05.07.2023	Write the structure, function of 20 amino acids, different flavours and its compound
2 <sup>nd</sup> assignment	01.08.2023	Name symptoms, diagnosis, treatment of salmonellosis, typhoid, paratyphoid, shigellosis, campylobacteriosis, <i>E.coli</i> , shigellosis, cholera, que fever, Boutlism, Listeria
3 <sup>rd</sup> assignment	20.08.2023	Define Milling, canning, freezing, pasteurization, mincing, homogenization, fermentation, emulsification, branching

**Course Outcomes:** After studying this course, students will able to

- Display a solid foundation in understanding the biochemical, nutritional, physiological, ethical and safety aspect of food.
- Understand the factors influencing microbial growth, its intoxication and diagnostic system used in food industry to detect the microbial spoilage.
- To illustrate the different processing, preservative techniques to enhance the shelf life and production of food by fermentation processes using biotechnological approach.
- To analyse the different food sample for microbial contamination.

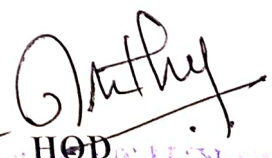
**Text books:**

1. Food microbiology William C Frazier and Westhoff Dennis C Tata McGraw Hill publication 5th Edn 2013
2. Food Biotechnology Kalidas Shetty CRC Press 2nd Edn 2005
3. Food Biotechnology J Polak, J Tramper and S Bielecki Elsevier Science 2000

**Reference books:**

Food Process Engineering, D.R. Heldman and R.P. Singh. edition

  
Faculty

  
HOD  
S. K. J. NATLA  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 088.





THE OXFORD COLLEGE OF ENGINEERING  
HOSUR ROAD, BOMMANAHALLI, BANGALORE - 68  
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Lesson Plan

Date: 10/03/2023

Subject code : 18CS653.  
Subject Title : Programming in Java  
Course / Branch : B.E/BT  
Semester : VI  
Academic Year : 2022-23 (Even)  
Faculty Name : KARTHIK S L

**COURSE OBJECTIVES:**

- 1 Learn fundamental features of object oriented language and JAVA
- 2 set up Java JDK environment to create, debug and run simple Java programs.
- 3 Learn object oriented concepts using programming examples.
- 4 Study the concepts of importing of packages and exception handling mechanism.
- 5 Discuss the String Handling examples with Object Oriented concepts

**COURSE OUTCOMES:**

- 1 Explain the object-oriented concepts and JAVA.
- 2 Develop computer programs to solve real world problems in Java. Develop simple GUI interfaces for a computer program to interact with users.
3. Demonstrate the ability to design and develop java programs, analyze, and interpret object-oriented data and document results.
4. Apply the concepts of multiprogramming, exception/event handling, and abstraction to develop robust programs.
5. Develop use friendly applications using File I/O and GUI concepts.

**PREREQUISITE:** Basic Knowledge of C programming language and structures

Module	Topic No.	Date	Topic	Books Referred & Pages
I	1.	20/3/23	An Overview of Java: Object-Oriented Programming,	T1: 15-21 R1:150-160
	2.	22/3/23	A First Simple Program, A Second Short Program, Two Control Statements,	T1: 21-27 R1:160-165
	3.	24/3/23	Using Blocks of Code, Lexical Issues,	T1 : 27-31 R1:170-175
	4.	25/3/23	The Java Class Libraries, Data Types,	T1: 31-32 R1:175-180
	5.	27/3/23	Variables, and Arrays: Java Is a Strongly Typed Language,	T1 : 33-33 R1:180-185
	6.	29/3/23	The Primitive Types, Integers,	T1: 33-36 R1:190-194
	7.	30/3/23	Floating-Point Types, Characters, Booleans,	T1: 36-39 R1:195-205

II	8	31/3/23	A Closer Look at Literals, Variables, Type Conversion and Casting,	T1:39-45 R1:200-205	
	9.	5/4/23	Automatic Type Promotion in Expressions,	T1:47-47 R1:205-210	
	10.	6/4/23	Arrays, A Few Words About Strings	T1:48-56 R1:210-215	
	11.	8/4/23	Operators: Arithmetic Operators, The Bitwise Operators,	T1:57-69	
	12.	10/4/23	Relational Operators, Boolean Logical Operators,	T1:69-72	
	13.	12/4/23	The Assignment Operator, The ? Operator,	T1:73-73	
	14.	13/4/23	Operator Precedence, Using Parentheses, Control Statements:	T1:73-77	
	15.	17/4/23	Java's Selection Statements,	T1:77-80	
	16	19/4/23	Iteration Statements, Jump Statements.	T1:80-103	
	17.	20/4/23	Introducing Classes: Class Fundamentals, Declaring Objects,	T1:105-109	
	18.	21/4/23	Assigning Object Reference Variables, Introducing Methods, Constructors, The this Keyword,	T1:111-121	
	19.	27/4/23	Garbage Collection, The finalize( ) Method,	T1:121-121	
	20.	28/4/23	A Stack Class, A Closer Look at Methods and Classes: Overloading Methods,	T1:122-128	
	III	21.	3/5/23	Using Objects as Parameters,	T1:130-132
		22.	4/5/23	A Closer Look at Argument Passing,	T1:132-134
		23.	5/5/23	Returning Objects, Recursion, Introducing Access Control,	T1:134-138
		24.	8/5/23	Understanding static, Introducing final, Arrays Revisited,	T1:141-143
		25.	10/5/23	Inheritance: Inheritance, Using super,	T1:157-166
		26.	11/5/23	Creating a Multilevel Hierarchy, When Constructors Are Called,	T1:167-170
27.		12/5/23	Method Overriding, Dynamic Method Dispatch,	T1:171-174	
28.		15/5/23	Using Abstract Classes, Using final with Inheritance, The Object Class.	T1:177-181	
29.		17/5/23	Packages and Interfaces: Packages, Access Protection,	T1:183-185	
30.		18/5/23	Importing Packages, Interfaces,	T1:190-202	



IV	31.	19/5/23	Exception Handling: Exception-Handling Fundamentals, Exception Types,	T1:205-206 R5:220-225
	32.	20/5/23	Uncaught Exceptions, Using try and catch, Multiple catch Clauses,	T1:206-209
	33.	22/5/23	Nested try Statements, throw, throws, finally,	T1:211-216
	34.	24/5/23	Java's Built-in Exceptions, Creating Your Own Exception Subclasses,	T1:217-219
	35.	25/5/23	Chained Exceptions, Using Exceptions.	T1:221-222
	36.	26/5/23	Enumerations, Type Wrappers,	T1:255-264
	37.	29/5/23	I/O, Applets, and Other Topics: I/O Basics,	T1:285-288
	38.	31/6/23	Reading Console Input, Writing Console Output,	T1:288-292
	39.	4/6/23	The PrintWriter Class, Reading and Writing Files,	T1:292-293
	40.	6/6/23	Applet Fundamentals, The transient and volatile Modifiers,	T1:296-299
V	41.	7/6/23	Using instanceof, strictfp, Native Methods,	T1:300-306
	42.	8/6/23	Using assert, Static Import	T1:306-309
	43.	12/6/23	Invoking Overloaded Constructors Through this(),	T1:312-312
	44.	14/6/23	String Handling: The String Constructors, String Length, Special String Operations,	T1:359-364
	45.	15/6/23	Character Extraction, String Comparison,	T1:365-369
	46.	16/6/23	Searching Strings, Modifying a String,	T1:370-373
	47.	17/6/23	Data Conversion Using valueOf( ),	T1:374-374
	48.	19/6/23	Changing the Case of Characters Within a String ,	T1:375-375
	49.	21/6/23	Additional String Methods, StringBuffer, StringBuilder.	T1:376-384
	50.	22/6/23	Revision	

**SELF-STUDY TOPICS (NOT INCLUDED IN SYLLABUS)**

Sl. No.	Self-study Topics	Suggested Reference
1.	Structures & Procedure-Oriented Programming system	R1 & R2.
2.	Applet functions	R2.

## ASSIGNMENT TOPICS

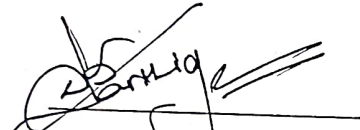
Sl. No.	Assignment Topics	Submission due on
1.	Classes and objects & Inheritance	20/04/23
2.	Programs based on Exception handling and Applets	25/05/23
3.	Character Extraction, String Comparison,	26/06/23

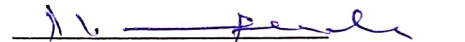
### TEXT BOOKS:

T1: Herbert Schildt, Java The Complete Reference, 7th Edition, Tata McGraw Hill, 2007.

### REFERENCE BOOKS:

1. Cay S Horstmann, "Core Java - Vol. 1 Fundamentals", Pearson Education, 10th Edition, 2016.
2. Raoul-Gabriel Urma, Mario Fusco, Alan Mycroft, "Java 8 in Action", Dreamtech Press/Manning Press, 1st Edition, 2014

  
Faculty

  
HOD/ISE  
Dr. R. KANAGAVALLI  
PROFESSOR & HOD-ISE  
The Oxford College Of Engineering  
Jommanahalli, Hosur Main Road,  
Bangalore 560 068.



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**THE OXFORD COLLEGE OF ENGINEERING**  
**DEPARTMENT OF BIOTECHNOLOGY**

Hosur Road, Bommanahalli, Bengaluru-560 068  
 080-30219601/02, Fax: 080-25730551, 30219629,

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 Belgaum)

(Approved by AICTE, New Delhi, Accredited by NAAC, New Delhi & Affiliated to VTU, Belgaum)

**Subject Title:** Regulatory Affairs in Biotech Industry  
**Course/Branch:** B.E/Biotechnology  
**Faculty name:** Ms. Ramya.K

**Subject code:** 18BT81  
**Semester:** VIII  
**Academic year:** 2022-2023 (EVEN)

**Course Objectives:** The objective of this course is to

- Learn about the regulatory rules and guidelines that specify parameters of the safety
- Understand the quality standards in the biotech industry

Module	Topic no.	Topics planned	Period	Date	Books ref. & page no.
1	1	Validation and Regulatory Affairs in Bio (Pharmaceutical) Manufacturing: An Introduction to FDA Operations & Industry Compliance Regulations	2	17/2/23	T2 (122-167) T3 (58-98)
	2	The Fundamentals of Regulatory Compliance with respect to Good Clinical Practice (GCP)	4	17/2/23	Self-notes E-notes
	3	Good Manufacturing Practice (GMP) & Good Laboratory Practice (GLP).	2	24/2/23	E-notes T4 (141)
	4	An Introduction to the Basic Concepts of Process Validation Qualification (IQ, OQ & PQ) Procedures	4	24/2/23	T4 (141)
	5	A Review of Prospective, Concurrent, Retrospective Validation, Revalidation	1	25/2/23	E-notes R2 (166-185)
	6	ISO 9000 Series, International Conference on Harmonization	3	25/2/23	E-notes E-notes



		Effect of ICH upon GMP's			03/3/23	E-notes E-notes
2	1	Validation of Water & Thermal Systems HVAC Facilities & Cleaning Validation	2			
	2	Validation of Active Pharmaceutical Ingredients (APIs) & Aseptic Processes	4		03/3/23	E-notes Self-notes
	3	Validation of Non-Sterile Processes (used in the manufacture of Solids, Liquids, Semisolid Dosage Forms. Overview of method evolution, FDA and ICH guidelines,	1		10/3/23	E-notes E-notes
	4	Development and validation, Basic statistical concepts, Outliers, Specificity: sample preparation, Specificity: separations, Specificity: detectors, Linearity, Accuracy	3		10/3/23	E-notes T4 (212-231)
	5	Precision, Limits of detection (LOD) quantification (LOQ), Minimum detectable amount (MDA), Sample stability and method robustness, Window diagrams	1		11/3/23	E-notes Self-notes
	6	System suitability, statistical process control for HPLC, Sustainable validation, Troubleshooting out-of-control system, case studies	3		11/3/23	E-notes T1 (303-345)
3	1	Introduction, ISO 9000 Series of Standards, Management Responsibility, Quality System	2		24/3/23	T5 (56-89) T5
	2	Contract Review, Design Control, Document and Data Control, Preservation and Delivery, Control of Quality Records, Internal Quality	4		24/3/23	E-notes T1(311-378)

		Audits, Training, Servicing, Statistical Techniques,			
3	3	ISO-9001-2000, Scope, Normative Reference, Terms Definitions, Quality Management, System, Documents Requirements, Management's Responsibility	1	25/3/23	T1(311-378) R1-(10-38)
	4	Resource Management, Infrastructure, Product Realization, Measurement, Analysis and Improvement, ISO-14001, Environmental Management Systems.	3	25/3/23	Internet notes E-notes
4	1	QUALITY AND IMPLEMENTATION: Terminology Relating to Quality, Quality Requirement, Customer Satisfaction, Capability.	2	31/3/23	E-notes E-notes
	2	Terms Relating to Management, Management System, Quality Management System, Quality Policy, Quality Objectives	4	31/3/23	Self notes E-notes
	3	Quality Planning, Quality Control, Quality Assurance, Quality Improvement, Continual Improvement, Effectiveness, Efficiency	2	8/4/23	T1 (303-345) T5 (56-89)
	4	Terms relating to Characteristics, Quality Characteristics; Terms Relating to Conformity, Non- Conformity, Defect	4	08/4/23	T5 T1(311-378)
	5	Preventive Action, Corrective Action, Correction, Rework, Repair, Scrap, Concession, Deviation Permit, Release	1	21/4/23	R1-(10-38) E-notes
	6	Objective Evidence, Inspection, Test,	3	21/4/23	Self notes R1-(10-38)

		Metrological Confirmation, Quality, System, Contract Review, Design Control, Document and Data Control			
	7	Purchasing, Control of Customer Supplied Product, Product Identification and Traceability, Process Control, Inspection and Testing	2	28/4/23	T1 (303-345) T5 (56-89)
	8	Final Inspection and Testing, Inspection and Test Status Handling, Storage, Packaging, Preservation and Delivery, Control of Quality Records	4	28/4/23	T5 T1(311-378)
	9	Internal Quality Audits, Training, Servicing, Statistical Techniques	1	5/5/23	R1-(10-38)
5	1	QUALITY MANAGEMENT: The development of regulatory requirements for validation, The V model and Life Cycle model approach to validation and documentation	3	5/5/23	E-notes Self notes
	2	Risk Analysis Techniques: Impact Assessment; Failure Mode and Effects Analysis (FMEA) Validation Master Plans, Commissioning and Qualification, Process Validation, Routine validation and revalidation	2	06/5/23	E-notes Self notes
	3	Contamination Control, Risk Management in the Pharmaceutical Industry, Solid Dose Manufacture Principles and Practices	4	06/5/23	E-notes Self notes
	4	Liquid and Cream Manufacture Principles and Practices, Good Laboratory Practices (for Non-Clinical Laboratories), Computer	1	15/5/23	E-notes Self notes



		Systems Validation Principles and Practices, Good Aseptic Practices and Sterile Products			
	5	Clinical Trials Quality Assurance Management, GxP and Quality Auditing Practices, Pharmaceutical Engineering – Facility, Equipment and Process Design, Fundamentals of Process, Analytical Technology, Quality and Continuous Improvement in the Biotech Industry	3	12/5/23	E-notes T5 (56-89) T1 (303-345)

#### Self-study Topics (Out –of- Syllabus)

Sl. No.	Self –study Topics	Suggested Reference
1	ISI Standards	T1, T2

#### Assignment Topics

Sl. No.	Assignment Topics	Submission due on
1	Stages on Process Validation	20/3/23
2	ISO Standards	17/4/23

**Course Outcomes:** After studying this course, students will able to

- To educate students about regulatory rules governing biotech industry
- Outline the importance of the quality and compliance in the biotech industry
- Comprehend the various regulatory guidelines and rules as well as the organizations governing the same.
- To learn the documentation process pertaining to quality management, QA, quality policy and marketing.
- To understand the importance of quality auditing, process designing, validating master plans & commissioning

#### Text books:

1. T1- T2-Good Manufacturing Practices for Pharmaceuticals: A Plan for Total Quality Control from Manufacturer to Consumer, Sidney J. Willig, Marcel Dekker.

2. T3-Validation of Pharmaceutical Processes: Sterile Products, Frederick J. Carlton (Ed.) and James Agalloco (Ed.), Marcel Dekker.
3. T4-Validation Standard Operating Procedures: A Step by Step Guide for Achieving Compliance in the Pharmaceutical, Medical Device, and Biotech Industries, Syed Imtiaz Haider, Saint Lucie Press.
4. T5-Pharmaceutical Biotechnology by S P Vyas and V K Dixit, CBS Publishers

**Reference books:**

1. R1-Pharmaceutical Equipment Validation: The Ultimate Qualification Handbook, Phillip A. Cloud, Interpharm Press.
2. R2-Commissioning and Qualification, ISPE Pharmaceutical Engineering Baseline Guides Series.

  
Faculty

  
HOD  
**DR. B.K. MANNATHA**  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.





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**DEPARTMENT OF BIOTECHNOLOGY**

Hosur Road, Bommanahalli, Bengaluru-560 068  
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**Lesson Plan**

**Subject code** : 18BT822  
**Branch** : Biotechnology  
**Academic Year** : 2022-23 (Even Sem)

**Date**: 13.02.23

**Title**: INDUSTRIAL MICROBIOLOGY  
**Semester**: VIII  
**Faculty** : Mr. Divakara R

**Prerequisites**: Basic knowledge of microbiology, genetic engineering and analytical techniques

**Course Objectives**:

This course will enable students to

- To understand the details of microbial techniques for growth, cultivation and characterization of microorganisms with industrial importance.
- To appreciate the recent developments in the area of medical microbiology, environmental microbiology, industrial microbiology, etc.

Module	No.	Date	Topic	Period	Ref Books & Pages
1	1	17.02.23	The era of the discovery of Microbes	2	T4: 2-17; T3:118-135; 98-130 T4: 75-90
	2	17.02.23	Scope of Industrial Microbiology and fermentation technology	3	
	3	24.02.23	Growth of Industrial Fermentations	2	
	4	24.02.23	Study of industrially important micro-organisms	3	
	5	25.02.23	Study of industrially important micro-organisms	1	
	6	25.02.23	Preservation of industrially important micro-organisms	3	
	7	03.03.23	Criteria for selection and strategies for strain improvement	2	
	8	03.03.23	Criteria for selection and strategies for strain improvement	3	
	9	10.03.03	Maintenance and containment of recombinant organisms	2	
	10	10.03.23	maintenance and containment of recombinant organisms	3	
2	1	11.03.23	Characteristics of an Ideal Production Media	1	T3: 147-169; T4:42-70;
	2	11.03.23	Raw materials for production of media	3	
	3	20.03.23	Batch culture: growth kinetics	2	
	4	20.03.23	Growth kinetics: effect of environment: temperature	3	
	5	21.03.23	Growth kinetics: pH and nutrient concentration	2	
	6	21.03.23	Monitoring microbial growth in culture: cell number, direct and indirect methods	3	
	7	22.03.23	Continuous culture: concepts of Newtonian and Non-Newtonian fluid	2	
	8	22.03.23	Continuous culture: plastic fluids, apparent viscosities	3	
	9	24.03.23	Anti-foam agents	2	
3	1	24.3.23	Basic features, design & components – Typical fermenter	3	T3-165-169; T4:401-440
	2	25.03.23	Sterilization of fermenter, medium, air supply	1	
	3	25.03.23	Aseptic inoculation and sampling methods	3	
	4	31.03.23	scale up of fermentation process (parameters used in scale up, problems associated)	2	
	5	31.03.23	Merits & demerits	3	
	6	6.04.23	Fermentation media: Media formulation strategies	1	
	7	6.04.23	Sources of carbon, nitrogen, vitamins and minerals	2	
	8	8.04.23	Role of buffers, precursors, inhibitors and inducers	1	
	9	8.04.23	Specialized bioreactors (Photobioreactors, Membrane, Fluidized bed, Tubular and Packed bed bioreactor)	3	
	10	21.04.23	Specialized bioreactors (Photobioreactors, Membrane, Fluidized bed, Tubular and Packed bed bioreactor)	2	
4	1	24.04.23	Introduction and History of Assay	3	T3:423-430; T4:468-469
	2	25.04.23	Microbiological assay of: Vitamins	1	
	3	26.04.23	Microbiological assay of: Amino Acids	1	
	4	27.04.23	Microbiological assay of: Antibiotics, Trace elements	1	
	5	27.04.23	Advantages and Disadvantages of Microbiological Assay	2	
	6	28.04.23	Estimation of growth in SSF	2	
	7	28.04.23	Comparison of SSF with SmF	3	
	8	5.05.23	Factors influencing SSF	2	
	9	5.05.23	Kinetics of SSF	3	
	10	6.05.23	Design of fermenter in SSF	1	
	11	6.05.23	Production of commercially important products by SSF	3	
5	1	11.05.23	Objectives and criteria of downstream processing	1	
	2	11.05.23	Foam separation, precipitation methods	2	

				2	T4: 619-673; T:439-451; 171-180
	3	12.05.23	Filtration and centrifugation	3	
	4	12.05.23	Cell disruption methods	1	
	5	15.05.23	Liquid extraction of the products	2	
	6	15.05.23	Membrane filtration	1	
	7	16.05.23	Chromatography; Drying devices	2	
	8	16.05.23	Crystallization of the product; Solvent recovery; Effluent treatment	1	
	9	17.05.23	Process economics		

Assignment Topics		Submission due on
Sl. No.	Assignment Topics	
1	Important questions form Module I & II	20/03/23
2	Important questions form Module III & IV	22/04/23
3	Important questions form Module V	12/5/23

**Course outcomes:**

At the end of the course the student will be able to

- Understand the strategies for selection, isolation, improvement and preservation of industrial important microorganisms
- Define process of fermentation and its parameters
- Understand the design of fermenters, types of fermenters, and media used for the fermentation process
- Interpret the types fermentation and assay carried out for various commercially important product in fermentation industries
- Describe the isolation and purification of product produced by the process of fermentation

**Text books:**

1. Microbiology. Michael J Pelczar Jr Chan ECS, Noel R Krieg. Tata McGraw Hill, 5th Edn
2. Microbiology Prescott, Harley, Klein McGraw Hill 2008
3. Industrial Microbiology Palynology and its applications Samuel C Prescott, Cecil G Dunn, Agro bios (India)
4. Modern Industrial Microbiology and Biotechnology. Nduka Okafor, Benedict C. Okeke, CRC Press, Second Edition
5. Principles of Fermentation Technology, Peter F. Stanbury, Allan Whitaker, Stephen J. Hall, Elsevier Ltd.

*e/c O. Okeke*  
12/12/23

*[Signature]*  
Faculty

*Dr. Okeke*  
Professor  
Department of Biotechnology  
The University of Lagos  
Akoka, Lagos State, Nigeria



## CHILDREN'S EDUCATION SOCIETY (REGD.)

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1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF BIOTECHNOLOGY

### LESSON PLAN

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 20/10/23 to 16/11/24**

**SUB.CODE & Name: BBT306D / PPP**

**Year/Sem/Section 2<sup>nd</sup> YEAR / 3rd SEM**

**COURSE OBJECTIVES** This course will enable the students to  
CLO1. To learn the fundamental so plant physiology  
CLO2. To learn the fundamental so plant physiology  
CLO3. To learn the fundamental so plant physiology

#### **COURSE OUTCOMES:**

<b>CO1</b>	Comprehend the fundamental principles of plant physiology.
<b>CO2</b>	Examining the mechanisms of plant hormone action.
<b>CO3</b>	Analysing the interaction between phytohormones and the environment.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Definition and scope of plant physiology	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Plant anatomy and morphology	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	Plant growth and development	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	Water Relations and Mineral Nutrition	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	Water potential and its measurement	18/9/23	2	T1, R2	Smart board , ppt



6.	20/9/23	1	Water uptake and transport in plants	20/9/23	1	T1, R2	Smart board , ppt	
7.	21/9/23	3	Mineral nutrients and their roles in plant growth	21/9/23	3	T1, R2	Smart board , ppt	
8.	22/9/23	1	Nutrient uptake and transport mechanisms.	22/9/23	1	T1, R2	Smart board , ppt	
9.	25/9/23	2	Light absorption and chlorophyll pigments	25/9/23	2	T1, R2	Smart board , ppt	
10	27/9/23	1	Photosynthetic pigments and their functions,	27/9/23	1	T1, R2	Smart board , ppt	
11	28/9/23	3	Calvin cycle and carbon fixation	28/9/23	3	T1, R2	Smart board , ppt	
12	29/9/23	1	Factors affecting photosynthesis,	29/9/23	1	T1, R2	Smart board , ppt	
13	29/9/23	2	Respiration and Energy Metabolism	29/9/23	2	T1, R2	Smart board , ppt	
14	29/9/23	1	Cellular respiration and ATP production,	29/9/23	1	T1, R2	Smart board , ppt	
15	2/10/23	3	Glycolysis	2/10/23	3	T1, R2	Smart board , ppt	
16	2/10/23	1	Krebs cycle,	2/10/23	1	T1, R2	Smart board , ppt	
17	4/10/23	2	electron transport chain	4/10/23	2	T1, R2	Smart board , ppt	
18	5/10/23	1	Aerobic and anaerobic respiration.	5/10/23	1	T1, R2	Smart board , ppt	
19	6/10/23	3	Introduction to phytohormones	6/10/23	3	T1, R2	Smart board , ppt	
20	9/10/23	1	Auxins: functions and physiological effects, .	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	Gibberellins: functions and physiological effects	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	cytokinins: functions and physiological effects	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	Absciscic acid: functions and physiological effects,	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	<b>CIE 1</b>						Harn
25	17/9/23							Harn
26	18/9/23							Impl
27	25/10/23	1	Seed germination and dormancy,	25/10/23	1	T1, R2	Smart board , ppt	

28	26/10/23	2	Photomorphogenesis and photoperiodism,	26/10/23	2	T1, R2	Smart board , ppt
29	27/10/23	1	Flowering and reproduction,	27/10/23	1	T1, R2	Smart board , ppt
30	30/10/23	3	Senescence and aging	30/10/23	3	T1, R2	Smart board , ppt
31	2/11/23	1	Tropisms: phototropism	2/11/23	1	T1, R2	Smart board , ppt
32	3/11/23	2	Gravitropism, thigmotropism	3/11/23	2	T1, R2	Smart board , ppt
33	6/11/23	1	Nastic movements: nyctinasty, eismonasty, Movements in response to environmental cues.	6/11/23	1	T1, R2	Smart board , ppt
34	8/11/23	3	Plant responses to abiotic stress (e.g., temperature, light, drought)	8/11/23	3	T1, R2	Smart board , ppt
35	9/11/23	1	Plant responses to biotic stress (e.g., pathogens, herbivores)	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Plant defence mechanisms	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	Signal transduction pathways in stress responses	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Plant responses to light and photomorphogenesis	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	Plant responses to temperature, Water, and nutrients	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	<b>CIE 2</b>					
41	20/11/23						
42	21/11/23						

### Continuous and Comprehensive Evaluation (CCE)

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) ~~Participatory & Industry-integrated learning~~  
i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- x) Analysis of industry/ technical/business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

**Faculty can choose any two of the following:**



- **Text Books:**

Plant Hormones: Physiology, Biochemistry and Molecular Biology" by P.J. Davies and H.G. Davies

**Reference Book:**

1. <https://www.cambridge.org/core/books/abs/plant-physiology/plant-hormones-and-signal-transduction/9A8F77D94D53C30A70F3B6A406CFB187>



Faculty

(Dr. Nair Sreecha Chandran)



HOD

Dr. B.K. MANJUNATHA  
Professor & Head  
Department of Biotechnology  
The Oxford College of Engineering  
Bengaluru-560 068.

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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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## THE OXFORD COLLEGE OF ENGINEERING

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF BIOTECHNOLOGY

### LESSON PLAN

**Faculty Name: Dr. Nair Sreecha Chandran**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: BT**

**Year/Sem/Section 2<sup>nd</sup> YEAR / 4th SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To help the students appreciate the essential complementarity between Values and Skills.

CLO2. To ensure sustained happiness and prosperity which are the core aspirations of all human beings.

CLO3. To facilitate the development of a Holistic perspective

CLO4. To highlight plausible implications of such a Holistic understanding in terms of ethical human

Conduct.

### **COURSE OUTCOMES:**

<b>CO1</b>	Understand and analyse the essentials of human values and skills, self exploration, happiness and prosperity.
<b>CO2</b>	Evaluate coexistence of the “I” with the body.
<b>CO3</b>	Identify and evaluate the role of harmony in family, society and universal order.
<b>CO4</b>	Understand and associate the holistic perception of harmony at all levels of existence.
<b>CO5</b>	Develop appropriate technologies and management patterns to create harmony in professional and personal lives

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Harmony in the Human Being	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Harmony in the Family and Society	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	Harmony in the Family and Society	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	Harmony in the Family and Society	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	Harmony in the Nature/Existence	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	Harmony in the Nature/Existence	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	Harmony in the Human Being	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	Harmony in the Family and Society	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Harmony in the Nature/Existence	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Harmony in the Nature/Existence	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	Harmony in the Nature/Existence	28/9/23	3	T1, R2	Smart board , ppt
12	29/9/23	1	Implications of the Holistic Understanding	29/9/23	1	T1, R2	Smart board , ppt
13	29/9/23	2	Implications of the Holistic Understanding	29/9/23	2	T1, R2	Smart board , ppt
14	29/9/23	1	Introduction to Value Education	29/9/23	1	T1, R2	Smart board , ppt
15	2/10/23	3	Introduction to Value Education	2/10/23	3	T1, R2	Smart board , ppt
16	2/10/23	1	Harmony in the Human Being	2/10/23	1	T1, R2	Smart board , ppt
17	4/10/23	2	Harmony in the Human Being	4/10/23	2	T1, R2	Smart board , ppt
18	5/10/23	1	Harmony in the Human Being	5/10/23	1	T1, R2	Smart board , ppt

19	6/10/23	3	Harmony in the Family and Society	6/10/23	3	T1, R2	Smart board , ppt	
20	9/10/23	1	Harmony in the Family and Society	9/10/23	1	T1, R2	Smart board , ppt	
21	11/10/23	2	Harmony in the Family and Society	11/10/23	2	T1, R2	Smart board , ppt	
22	12/9/23	1	Harmony in the Nature/Existence	12/9/23	1	T1, R2	Smart board , ppt	
23	13/9/23	3	Harmony in the Nature/Existence	13/9/23	3	T1, R2	Smart board , ppt	
24	16/9/23	<b>CIE 1</b>						Harmon
25	17/9/23							Harmon
26	18/9/23							Impl
27	25/10/23	1	Implications of the Holistic Understanding	25/10/23	1	T1, R2	Smart board , ppt	
28	26/10/23	2	Introduction to Value Education	26/10/23	2	T1, R2	Smart board , ppt	
29	27/10/23	1	Introduction to Value Education	27/10/23	1	T1, R2	Smart board , ppt	
30	30/10/23	3	Harmony in the Human Being	30/10/23	3	T1, R2	Smart board , ppt	
31	2/11/23	1	Harmony in the Human Being	2/11/23	1	T1, R2	Smart board , ppt	
32	3/11/23	2	Harmony in the Human Being	3/11/23	2	T1, R2	Smart board , ppt	
33	6/11/23	1	Harmony in the Family and Society	6/11/23	1	T1, R2	Smart board , ppt	
34	8/11/23	3	Harmony in the Family and Society	8/11/23	3	T1, R2	Smart board , ppt	
35	9/11/23	1	Harmony in the Family and Society	9/11/23	1	T1, R2	Smart board , ppt	
36	10/11/23	2	Implications of the Holistic Understanding	10/11/23	2	T1, R2	Smart board , ppt	
37	13/11/23	1	Implications of the Holistic Understanding	13/11/23	1	T1, R2	Smart board , ppt	
38	15/11/23	3	Implications of the Holistic Understanding	15/11/23	3	T1, R2	Smart board , ppt	



39	16/11/23	1	Implications of the Holistic Understanding	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	Implications of the Holistic Understanding	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						

## Continuous and Comprehensive Evaluation (CCE)

### Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	ASSIGNMENT	12/9/2023
2	ASSIGNMENT	17/11/23

### Text Books:

1. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

### Reference Book:

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.



Faculty  
(Dr. Nair Sreecha Chandran)



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### Name of the Department

### LESSON PLAN

**Faculty Name: Gayathri R**

**Academic Year: 2023-24**

**SUB.CODE & Name: 21CV53**

**Year/Sem/Section: 3rd Year/5th sem**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Identify, formulate and solve engineering problems of RC elements subjected to different kinds of loading.

CLO2. Follow a procedural knowledge in designing various structural RC elements.

CLO3. Impart the usage of codes for strength, serviceability and durability.

CLO4. Provide knowledge in analysis and design of RC elements.

### **COURSE OUTCOMES:**

<b>CO1</b>	Understand the design philosophy and principles
<b>CO2</b>	Solve engineering problems of RC elements subjected to flexure, shear and torsion.
<b>CO3</b>	Demonstrate the procedural knowledge in designs of RC structural elements such as slabs, columns and footings.
<b>CO4</b>	Owns professional and ethical responsibility.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	25/11/23	2nd	<b>INTRODUCTION</b>	25/11/23	2nd	T1, R2	Smart board , ppt
2.	27/11/23	3rd	Introduction to working stress and limit State Design:	27/11/23	3rd	T1, R2	Smart board , ppt
3.	28/11/23	1st and 2nd	Basics of different methods of design	28/11/23	1st and 2nd	T1, R2	Smart board , ppt
4.	29/11/23	3rd	Difference between Working stress and Limit State Method of design, Modular Ratio and Factor of Safety and evaluation of design constants for working stress method	29/11/23	3rd	T1, R2	Smart board , ppt
5.	29/11/23	3rd	Philosophy and principle of limit state design with assumptions. Partial Safety factors, Characteristic load strength.	29/11/23	3rd	T1, R2	Smart board , ppt
6.	1/12/23	3rd	Limiting deflection, short term deflection, long term deflection, Calculation of deflection of singly reinforced beam only.	1/12/23	3rd	T1, R2	Smart board , ppt
7.	4/12/23	3rd	Cracking in reinforced concrete members, calculation of crack width of singly reinforced beam. Side face reinforcement, slender limits of beams for stability	4/12/23	3rd	T1, R2	Smart board , ppt
8.	5/12/23	1st and 2nd	Methods of population forecasting	5/12/23	1st and 2nd	T1, R2	Smart board , ppt
9.	6/12/23	3rd	numerical problems	6/12/23	3rd	T1, R2	Smart board , ppt
10	8/12/23	3rd	numerical problems	8/12/23	3rd	T1, R2	Smart board , ppt
11	11/12/23	3rd	numerical problems	11/12/23	3rd	T1, R2	Smart board , ppt
12	12/12/23	3rd	numerical problems	12/12/23	3rd	T1, R2	Smart board , ppt
13	18/12/23	1st and 2nd	numerical problems	18/12/23	1st and 2nd	T1, R2	Smart board , ppt
14	18/12/23	3rd	numerical problems	18/12/23	3rd	T1, R2	Smart board , ppt
15	21/12/23	3rd	numerical problems	21/12/23	3rd	T1, R2	Smart board , ppt
16	22/12/23	3rd	numerical problems	22/12/23	3rd	T1, R2	Smart board , ppt
17	22/12/23	2nd	Introduction of singly reinforced	22/12/23	2nd	T1, R2	Smart

			beams				board , ppt
18	28/12/24		<b>CIE 1</b>				
19	29/12/24		<b>CIE 1</b>				
20	30/12/24		<b>CIE 1</b>				
21	2/1/24	3rd	Introductin to doubly reinforced beams.	2/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
22	3/1/24	1st and 2nd	Introduction to flanged beams for flexure and shear	3/1/24	1st and 2nd	<b>T1, R2</b>	Smart board , ppt
23	3/1/24	3rd	numerical problems	3/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
24	5/1/24	3rd	numerical problems	5/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
25	5/1/24	3rd	Analysis of doubly reinforced beams.	5/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
26	5/1/24	3rd	numerical problems	5/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
27	8/1/24	3rd	numerical problems	8/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
28	8/1/24	1st and 2nd	Analysis of flanged beams for flexure and shear	8/1/24	1st and 2nd	<b>T1, R2</b>	Smart board , ppt
29	8/1/24	3rd	numerical problems	8/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
30	9/1/24	3rd	numerical problems	9/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
31	10/1/24	3rd	numerical problems	10/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
32	12/1/24	3rd	numerical problems	12/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
33	12/1/24	1st and 2nd	methods and preservation techniques.	12/1/24	1st and 2nd	<b>T1, R2</b>	Smart board , ppt
34	12/1/24	3rd	Limit State Design of Beams	12/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
35	15/1/24	3rd	Basic concepts of design	15/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
36	22/1/24	3rd	Design of singly and doubly reinforced beams	22/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
37	22/1/24	3rd	Design Problems sor singly reinforced	22/1/24	3rd	<b>T1, R2</b>	Smart board , ppt
38	29/1/24		<b>CIE 2</b>				
39	30/1/24		<b>CIE 2</b>				
40	31/1/24		<b>CIE 2</b>				
41	5/2/24	1st and 2nd	Design Problems sor singly reinforced	5/2/24	1st and 2nd	<b>T1, R2</b>	Smart board , ppt
42	5/2/24	3rd	Design Problems sor singly reinforced	5/2/24	3rd	<b>T1, R2</b>	Smart board , ppt
43	6/2/24	3rd	Design Problems sor singly reinforced	6/2/24	3rd	<b>T1, R2</b>	Smart board , ppt
44	7/2/24	3rd	Design problems for doubly reinforced	7/2/24	3rd	<b>T1, R2</b>	Smart board , ppt



45	9/2/24	3rd	Design problems for doubly reinforced	9/2/24	3rd	T1, R2	Smart board , ppt
46	9/2/24	1st and 2nd	Design problems for doubly reinforced	9/2/24	1st and 2nd	T1, R2	Smart board , ppt
47	12/2/24	3rd	Design of flanged beams	12/2/24	3rd	T1, R2	Smart board , ppt
48	13/2/24	3rd	design for combined bending, shear and torsion as per IS456	13/2/24	3rd	T1, R2	Smart board , ppt
49	13/2/24	3rd	Design of slow	13/2/24	3rd	T1, R2	Smart board , ppt
50	14/2/24	3rd	Design rapid sand filter without under drainage system And Numerical problems	14/2/24	3rd	T1, R2	Smart board , ppt
51	14/2/24	1st and 2nd	Limit State Design of Slabs and Stairs	14/2/24	1st and 2nd	T1, R2	Smart board , ppt
52	16/2/24	3rd	design of one way and two way slabs ad design of stairs	16/2/24	3rd	T1, R2	Smart board , ppt
53	19/2/24	3rd	Introduction to one way and two way slabs	19/2/24	3rd	T1, R2	Smart board , ppt
54	20/2/24	3rd	Design of cantilever, simply supported and one way continuous slab	20/2/24	3rd	T1, R2	Smart board , ppt
55	20/2/24	3rd	Design of two way slabs for different boundary conditions	20/2/24	3rd	T1, R2	Smart board , ppt
56	21/2/24	1st and 2nd	Design of dog legged and open well staircases.	21/2/24	1st and 2nd	T1, R2	Smart board , ppt
57	22/2/24	3rd	Importance of bond, anchorage length and lap length.	22/2/24	3rd	T1, R2	Smart board , ppt
58	23/2/24	3rd	Analysis and design of short axially loaded RC column.	23/2/24	3rd	T1, R2	Smart board , ppt
59	26/2/24	3rd	Design of columns with uniaxial and biaxial moments	26/2/24	3rd	T1, R2	Smart board , ppt
60	4/3/24	3rd	Design concepts of the footings	4/3/24	3rd	T1, R2	Smart board , ppt
61	19/3/24	1st and 2nd	Design of Rectangular and square column footings with axial load and also for axial load & moment.	19/3/24	1st and 2nd	T1, R2	Smart board , ppt
62	4/3/24	3rd	Introduction to one way and two way slabs	4/3/24	3rd	T1, R2	Smart board , ppt
63	4/3/24	3rd	Design of dog legged and open well staircases.	4/3/24	3rd	T1, R2	Smart board , ppt
64	5/3/24	3rd	Importance of bond, anchorage length and lap length.	5/3/24	3rd	T1, R2	Smart board , ppt
65	6/3/24	3rd	determination plant units	6/3/24	3rd	T1, R2	Smart board , ppt
66	7/3/24	1st and 2nd	distribution system with population forecasting for the given city.	7/3/24	1st and 2nd	T1, R2	Smart board , ppt
67	8/3/24	3rd	Numerical Problem	8/3/24	3rd	T1, R2	Smart board , ppt

68	11/3/24		CIE 3				
69	12/3/24		CIE 3				
70	13/3/24		CIE 3				

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

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- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	ASSIGNMENT	27/1/24
2	SEMINAR/QUIZ	25/2/24

#### Text Books:

1. Design of RC Structural Engineering H C Vishwanath
2. Design of RC Structural Engineering Punmia

#### Reference Book:

1. Design of RC Structural Engineering McGraw Hill International Edition
2. Design of RC Structural Engineering H C Vishwanth



**Faculty**



**Head of the Department**  
Department of Civil Engineering  
The Oxford College of Engineering  
Bangalore-560 068.

**HOD**

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Name of the Department: CIVIL ENGINEERING**

**LESSON PLAN**

**Faculty Name: HARSHITHA N**

**Academic Year: 2023-2024**

**SUB.CODE&Name: BCV301 / STRENGTH OF MATERIALS**

**Year/Sem/Section:2<sup>ND</sup>/ 3<sup>RD</sup>**

**COURSE OBJECTIVES** This course will enable the students to

CLO 1. Understand the simple stresses, strains, and compound stresses in various structural components.

Study drinking water quality standards and to illustrate qualitative analysis of water.

CLO 2. Understand the bending moments and shear forces in different types of beams under various loading conditions

CLO 3. Know the bending stress, shear stress, and torsional stress in beams and shafts with different cross sections

CLO 4. Understand the deflection in beams and the stability of columns under different loading conditions.

CLO 5. Understand the behaviour and strength of structural elements subjected to compound stresses and stresses in thin and thick cylinders.

**COURSE OUTCOMES:**

<b>CO1</b>	Evaluate the simple stresses, strains and compound stresses.
<b>CO2</b>	Calculate the Bending moments, shear force and draw BMD, SFD for various types of beams and loadings.
<b>CO3</b>	Analyse the bending stress, shear stress and torsional stress in beams and shafts with different cross sections.
<b>CO4</b>	Evaluate the deflection in beams and determine the stability of the columns.
<b>CO5</b>	Evaluate the behaviour and strength of structural elements under the action of compound stresses and stresses in thin and thick cylinders.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Referen ce Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	16-11-2023	5 <sup>TH</sup>	Introduction, Properties of Materials, Stress, Strain	16-11-2023	5 <sup>TH</sup>	(T1)	Chalk and board
2.	17-11-2023	2 <sup>ND</sup>	Hook's law, Poisson's Ratio, Stress – Strain Diagram for structural steel	17-11-2023	2 <sup>ND</sup>	(T1)	Chalk and board
3.	22-11-2023	4 <sup>TH</sup>	Principles of superposition, Total elongation of tapering bars of circular and rectangular cross sections. Composite section	22-11-2023	4 <sup>TH</sup>	(T1)	Chalk and board
4.	2-11-2023	4 <sup>TH</sup>	Total elongation of tapering bars of circular and rectangular cross sections. Composite section	2-11-2023	4 <sup>TH</sup>	(T1)	Chalk and board
5.	23-11-2023	5 <sup>TH</sup>	Total elongation of tapering bars of circular and rectangular cross sections. Composite section	23-11-2023	5 <sup>TH</sup>	(T1)	Chalk and board
6.	24-11-2023	2 <sup>ND</sup>	Volumetric strain, expression for volumetric strain	24-11-2023	2 <sup>ND</sup>	(T1)	Chalk and board
7.	29-11-2023	4 <sup>TH</sup>	Elastic constants, relationship among elastic constants	29-11-2023	4 <sup>TH</sup>	(T1)	Chalk and board
8.	29-11-2023	5 <sup>TH</sup>	Thermal stresses and strains,	29-11-2023	5 <sup>TH</sup>	(T1)	Chalk and board
9.	30-12-2023	2 <sup>ND</sup>	Compound bars subjected to thermal stresses	30-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
10.	01-12-2023	4 <sup>TH</sup>	State of simple shear.	01-12-2023	4 <sup>TH</sup>	(T1)	Chalk and board
11.	06-12-2023	4 <sup>TH</sup>	Introduction to types of beams, supports and loadings. Definition of shear force and bending moment	06-12-2023	4 <sup>TH</sup>	(T1)	Chalk and board
12.	06-12-2023	5 <sup>TH</sup>	Introduction to types of beams, supports and loadings. Definition of shear force and bending moment	06-12-2023	5 <sup>TH</sup>	(T1)	Chalk and board
13.	07-12-2023	2 <sup>ND</sup>	sign convention, Relationship between loading, shear force and	07-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board



			bending moment, Shear force and bending moment equations				
14.	08-12-2023	4 <sup>TH</sup>	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for cantilever,	08-12-2023	4 <sup>TH</sup>	(T1)	Chalk and board
15.	09-12-2023	4 <sup>TH</sup>	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for simply supported	09-12-2023	4 <sup>TH</sup>	(T1)	Chalk and board
16.	13-12-2023	4 <sup>TH</sup>	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for simply supported	13-12-2023	4 <sup>TH</sup>	(T1)	Chalk and board
17.	13-12-2023	5 <sup>TH</sup>	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for UDL (Uniformly Distributed Load)	13-12-2023	5 <sup>TH</sup>	(T1)	Chalk and board
18.	14-12-2023	2 <sup>ND</sup>	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for UDL (Uniformly Distributed Load)	14-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
19.	15-12-2023	4 <sup>TH</sup>	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for UVL (Uniformly Varying Load),	15-12-2023	4 <sup>TH</sup>	(T1)	Chalk and board
20.	20-12-2023	5 <sup>TH</sup>	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for UVL (Uniformly Varying Load),	20-12-2023	5 <sup>TH</sup>	(T1)	Chalk and board
21.	20-12-2023	2 <sup>ND</sup>	Couple and their combinations	20-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
22.	21-12-2023	4 <sup>TH</sup>	Introduction, pure bending theory, Assumptions, derivation of bending equation, modulus of rupture, section modulus, flexural rigidity. Expression for transverse shear stress in beams, Bending and shear stress distribution diagrams for circular, rectangular, 'I', and 'T' sections.	21-12-2023	4 <sup>TH</sup>	(T1)	Chalk and board
23.	22-12-2023	4 <sup>TH</sup>	Modulus of rupture, section modulus, flexural rigidity	22-12-2023	4 <sup>TH</sup>	(T1)	Chalk and board
24.	23-12-2023	5 <sup>TH</sup>	Expression for transverse shear stress in beams	23-12-2023	5 <sup>TH</sup>	(T1)	Chalk and board
25.	23-12-	2 <sup>ND</sup>	Expression for transverse shear	23-12-	2 <sup>ND</sup>	(T1)	Chalk and

	2023		stress in beams	2023			board
26.	26-12-2023		CIE 1				
27.	27-12-2023		CIE 1				
28.	28-12-2023		CIE 1				
29.	29-12-2023		CIE 1				
30.	03-01-2024	4 <sup>TH</sup>	Bending and shear stress distribution diagrams for circular	03-01-2024	4 <sup>TH</sup>	(T1)	Chalk and board
31.	03-01-2024	4 <sup>TH</sup>	Bending and shear stress distribution diagrams for circular	03-01-2024	4 <sup>TH</sup>	(T1)	Chalk and board
32.	04-01-2024	5 <sup>TH</sup>	Bending and shear stress distribution diagrams for rectangular	04-01-2024	5 <sup>TH</sup>	(T1)	Chalk and board
33.	05-01-2024	2 <sup>ND</sup>	Bending and shear stress distribution diagrams for rectangular	05-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
34.	10-01-2024	4 <sup>TH</sup>	Bending and shear stress distribution diagrams for I section	10-01-2024	4 <sup>TH</sup>	(T1)	Chalk and board
35.	10-01-2024	2 <sup>ND</sup>	Bending and shear stress distribution diagrams for T section	10-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
36.	11-01-2024	3 <sup>RD</sup>	Introduction, pure torsion, Assumptions, derivation of torsion equation for circular shafts,	11-01-2024	3 <sup>RD</sup>	(T1)	Chalk and board
37.	12-01-2024	4 <sup>TH</sup>	Torsional rigidity and polar modulus Power transmitted by a shaft	12-01-2024	4 <sup>TH</sup>	(T1)	Chalk and board
38.	17-01-2024	5 <sup>TH</sup>	Numerical on torsion	17-01-2024	5 <sup>TH</sup>	(T1)	Chalk and board
39.	18-01-2024	2 <sup>ND</sup>	Definition of slope, Deflection and curvature, Sign conventions,	18-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
40.	19-01-2024	4 <sup>TH</sup>	Derivation of moment- curvature equation	19-01-2024	4 <sup>TH</sup>	(T1)	Chalk and board
41.	24-01-2024	4 <sup>TH</sup>	Double integration method and Macaulay's method	24-01-2024	4 <sup>TH</sup>	(T1)	Chalk and board
42.	24-01-2024	5 <sup>TH</sup>	Slope and deflection for standard loading cases and for determinate prismatic beams subjected to point loads, UDL, UVL and couple.	24-01-2024	5 <sup>TH</sup>	(T1)	Chalk and board
43.	25-01-2024	2 <sup>ND</sup>	Slope and deflection for standard loading cases and for determinate prismatic beams subjected to point loads, UDL, UVL and couple.	25-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
44.	26-01-2024	4 <sup>TH</sup>	Slope and deflection for standard loading cases and for determinate prismatic beams subjected to point loads, UDL, UVL and couple.	26-01-2024	4 <sup>TH</sup>	(T1)	Chalk and board
45.	31-01-2024	4 <sup>TH</sup>	Introduction, short and long columns. Euler's theory; Assumptions	31-01-2024	4 <sup>TH</sup>	(T1)	Chalk and board
46.	31-01-	4 <sup>TH</sup>	Derivation for Euler's Buckling load	31-01-	4 <sup>TH</sup>	(T1)	Chalk and

	2024		for different end conditions, Limitations of Euler's theory	2024			board
47.	01-02-2024	2 <sup>ND</sup>	Derivation for Euler's Buckling load for different end conditions, Limitations of Euler's theory	01-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
48.	02-02-2024	4 <sup>TH</sup>	Derivation for Euler's Buckling load for different end conditions, Limitations of Euler's theory	02-02-2024	4 <sup>TH</sup>	(T1)	Chalk and board
49.	07-02-2024	4 <sup>TH</sup>	Rankine-Gordon's formula for columns.	07-02-2024	4 <sup>TH</sup>	(T1)	Chalk and board
50.	07-02-2024	4 <sup>TH</sup>	Introduction, state of stress at a point, General two-dimensional stress system	07-02-2024	4 <sup>TH</sup>	(T1)	Chalk and board
51.	08-02-2024	5 <sup>TH</sup>	Principal stresses and principal planes. Mohr's circle of stresses	08-02-2024	5 <sup>TH</sup>	(T1)	Chalk and board
52.	09-02-2024	2 <sup>ND</sup>	Principal stresses and principal planes. Mohr's circle of stresses	09-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
53.	10-02-2024	4 <sup>TH</sup>	Principal stresses and principal planes. Mohr's circle of stresses	10-02-2024	4 <sup>TH</sup>	(T1)	Chalk and board
54.	21-02-2024	4 <sup>TH</sup>	Principal stresses and principal planes. Mohr's circle of stresses	21-02-2024	4 <sup>TH</sup>	(T1)	Chalk and board
55.	21-02-2024	5 <sup>TH</sup>	Introduction, Thin cylinders subjected to internal pressure; Hoop stresses, Longitudinal stress and change in volume	21-02-2024	5 <sup>TH</sup>	(T1)	Chalk and board
56.	22-02-2024	2 <sup>ND</sup>	Introduction, Thin cylinders subjected to internal pressure; Hoop stresses, Longitudinal stress and change in volume	22-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
57.	23-02-2024	4 <sup>TH</sup>	Thick cylinders subjected to both internal and external pressure	23-02-2024	4 <sup>TH</sup>	(T1)	Chalk and board
58.	28-02-2024	5 <sup>TH</sup>	Thick cylinders subjected to both internal and external pressure	28-02-2024	5 <sup>TH</sup>	(T1)	Chalk and board
59.	29-02-2024	2 <sup>ND</sup>	Lame's equation, radial and hoop stress distribution.	29-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
60.	01-03-2024	4 <sup>TH</sup>	Lame's equation, radial and hoop stress distribution.	01-03-2024	4 <sup>TH</sup>	(T1)	Chalk and board
61.	02-03-2024		CIE 2				
62.	03-03-2024		CIE 2				
63.	04-03-2024		CIE 2				
64.	05-03-2024		CIE 2				

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

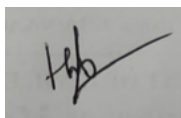
<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	CCE-1 from the above list	<b>03-01-2024</b>
2	CCE-2 from the above list	<b>25-02-2024</b>

**Text Books:**


- 1.R K Bansal, “A Textbook of Strength of Materials”, 4th Edition, Laxmi Publications, 2010 (T1)
- 2.B.C Punmia Ashok Jain, Arun Jain, “Strength of Materials”, Laxmi - 2018-22 Publications, 10th Edition-2018(T2)

**Reference Book:**

- 1.S SBhavikatti, “Strength of Materials” Vikas Publishing (5th Edition)
- 2.S.S. Rattan “Strength of Materials” McGraw Hill Education (India) Pvt. Ltd., 2nd Edition (Sixth reprint 2013).
- 3.B.S. Basavarajaiah, P. Mahadevappa “Strength of Materials” in SI Units, University Press (India) Pvt. Ltd., 3rd Edition,2010



**Faculty**



**Head of the Department**  
Department of Civil Engineering  
The Oxford College of Engineering  
Bangalore - 560 068.

**HOD**



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☎: 080-61754501 – 502 Fax: 080-2654 8658

### THE OXFORD COLLEGE OF ENGINEERING

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### Name of the Department

### LESSON PLAN

**Faculty Name: Nayana B S**

**Academic Year:2023-24**

**SUB.CODE&Name: 18CV72/ DESIGN OF RCC AND STEEL STRUCTURES**

**Year/Sem/Section:4th Year/ 7th sem**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Provide basic knowledge in the areas of limit state method and concept of design of RC and Steel structures

CLO2. Identify, formulate and solve engineering problems in RC and Steel Structures

CLO3. Give procedural knowledge to design a system, component or process as per needs and specifications of RC Structures like Retaining wall, Footing, Water tanks, Portal Frames and Steel Structures like Roof Truss, Plate Girder and Gantry Girder.

CLO4. Imbibe the culture of professional and ethical responsibilities by following codal provisions in the analysis, design of RC and Steel Structures.

CLO5. Provide factual knowledge on analysis and design of RC Structural elements, who can participate and succeed in competitive examinations.

### **COURSE OUTCOMES:**

<b>CO1</b>	Understand the Concept of Design of Footings and Retaining walls.
<b>CO2</b>	Understand the Concept of Design of water tanks and portal frames..
<b>CO3</b>	Understand the Concept of Design of Roof truss.
<b>CO4</b>	Understand the Concept of Design of Plate girder
<b>CO5</b>	Understand the Concept of Design of Gantry girder



SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2nd	Footings: Design of rectangular slab, slab-beam type combined footing.	25/11/23	2nd	T1, R2	Smart board , ppt
2.	11/9/23	3rd	Footings: Design of rectangular slab, slab-beam type combined footing.	27/11/23	3rd	T1, R2	Smart board , ppt
3.	13/9/23	1st and 2nd	Footings: Design of rectangular slab, slab-beam type combined footing.	28/11/23	1st and 2nd	T1, R2	Smart board , ppt
4.	14/9/23	3rd	Footings: Design of rectangular slab, slab-beam type combined footing.	29/11/23	3rd	T1, R2	Smart board , ppt
5.	20/9/23	3rd	Footings: Design of rectangular slab, slab-beam type combined footing.	29/11/23	3rd	T1, R2	Smart board , ppt
6.	21/9/23	3rd	Footings: Design of rectangular slab, slab-beam type combined footing.	1/12/23	3rd	T1, R2	Smart board , ppt
7.	25/9/23	3rd	Footings: Design of rectangular slab, slab-beam type combined footing.	4/12/23	3rd	T1, R2	Smart board , ppt
8.	25/9/23	1st and 2nd	Retaining Walls: Design of cantilever Retaining wall	5/12/23	1st and 2nd	T1, R2	Smart board , ppt
9.	27/9/23	3rd	Retaining Walls: Design of cantilever Retaining wall	6/12/23	3rd	T1, R2	Smart board , ppt
10	4/10/23	3rd	Retaining Walls: Design of cantilever Retaining wall	8/12/23	3rd	T1, R2	Smart board , ppt
11	5/10/23	3rd	counter fort retaining wall.	11/12/23	3rd	T1, R2	Smart board , ppt
12	9/10/23	3rd	counter fort retaining wall.	12/12/23	3rd	T1, R2	Smart board , ppt
13	9/10/23	1st and 2nd	counter fort retaining wall.	18/12/23	1st and 2nd	T1, R2	Smart board , ppt
14	11/10/23	3rd	Design of circular water tanks resting on ground (Rigid and Flexible base).	18/12/23	3rd	T1, R2	Smart board , ppt
15	12/10/23	3rd	Design of circular water tanks resting on ground (Rigid and Flexible base).	21/12/23	3rd	T1, R2	Smart board , ppt
16	16/10/23		<b>CIE I</b>				
17	17/10/23		<b>CIE I</b>				
18	18/10/23		<b>CIE I</b>				
19	25/10/23	3rd	Design of circular water tanks	22/12/23	3rd	T1, R2	Smart

			resting on ground (Rigid and Flexible base).				board , ppt
20	26/10/23	2nd	Design of circular water tanks resting on ground (Rigid and Flexible base).	22/12/23	2nd	T1, R2	Smart board , ppt
21	30/10/23	3rd	Design of rectangular water tanks resting on ground. As per IS: 3370 (Part IV).	30/10/23	3rd	T1, R2	Smart board , ppt
22	30/10/23	3rd	Design of rectangular water tanks resting on ground. As per IS: 3370 (Part IV).	30/10/23	3rd	T1, R2	Smart board , ppt
23	02/11/23	1st and 2nd	Design of rectangular water tanks resting on ground. As per IS: 3370 (Part IV).	02/11/23	1st and 2nd	T1, R2	Smart board , ppt
24	06/11/23	3rd	Design of portal frames with fixed and hinged based supports.	2/1/24	3rd	T1, R2	Smart board , ppt
25	06/11/23	1st and 2nd	Design of portal frames with fixed and hinged based supports.	3/1/24	1st and 2nd	T1, R2	Smart board , ppt
26	08/11/23	3rd	Design of portal frames with fixed and hinged based supports.	3/1/24	3rd	T1, R2	Smart board , ppt
27	09/11/23	3rd	Design of portal frames with fixed and hinged based supports.	5/1/24	3rd	T1, R2	Smart board , ppt
28	13/11/23	3rd	Design of portal frames with fixed and hinged based supports.	5/1/24	3rd	T1, R2	Smart board , ppt
29	13/11/23	3rd	Design of portal frames with fixed and hinged based supports.	5/1/24	3rd	T1, R2	Smart board , ppt
30	15/11/23	3rd	Roof Truss: Design of roof truss for different cases of loading, forces in members to given.	8/1/24	3rd	T1, R2	Smart board , ppt
31	16/11/23	1st and 2nd	Roof Truss: Design of roof truss for different cases of loading, forces in members to given.	8/1/24	1st and 2nd	T1, R2	Smart board , ppt
32	20/11/23		<b>CIE II</b>				
33	21/11/23		<b>CIE II</b>				
34	22/11/23		<b>CIE II</b>				
35	27/11/23	3rd	Roof Truss: Design of roof truss for different cases of loading, forces in members to given.	8/1/24	3rd	T1, R2	Smart board , ppt
36	27/11/23	3rd	Roof Truss: Design of roof truss for different cases of loading, forces in members to given.	9/1/24	3rd	T1, R2	Smart board , ppt
37	29/11/23	3rd	Roof Truss: Design of roof truss for different cases of loading, forces in members to given.	10/1/24	3rd	T1, R2	Smart board , ppt
38	04/12/23	3rd	Roof Truss: Design of roof truss for different cases of loading, forces in members to given.	12/1/24	3rd	T1, R2	Smart board , ppt
39	04/12/23	1st and 2nd	Roof Truss: Design of roof truss for different cases of loading, forces in members to given.	12/1/24	1st and 2nd	T1, R2	Smart board , ppt

40	06/12/23	3rd	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	12/1/24	3rd	T1, R2	Smart board , ppt
41	07/12/23	3rd	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	15/1/24	3rd	T1, R2	Smart board , ppt
42	11/12/23	3rd	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	22/1/24	3rd	T1, R2	Smart board , ppt
43	11/12/23	3rd	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	22/1/24	3rd	T1, R2	Smart board , ppt
44	13/12/23	1st and 2nd	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	13/12/23	1st and 2nd	T1, R2	Smart board , ppt
45	14/12/23	3rd	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	14/12/23	3rd	T1, R2	Smart board , ppt
46	18/12/23	3rd	Design of welded plate girder with intermediate stiffener, bearing stiffener and necessary checks	18/12/23	3rd	T1, R2	Smart board , ppt
47	18/12/23	1st and 2nd	Gantry Girder: Design of gantry girder with all necessary checks	5/2/24	1st and 2nd	T1, R2	Smart board , ppt
48	20/12/23	3rd	Gantry Girder: Design of gantry girder with all necessary checks	5/2/24	3rd	T1, R2	Smart board , ppt
49	21/12/23	3rd	Gantry Girder: Design of gantry girder with all necessary checks	6/2/24	3rd	T1, R2	Smart board , ppt
50	27/12/23		<b>CIE III</b>				
51	28/12/23		<b>CIE III</b>				
52	29/12/23		<b>CIE III</b>				
53	01/01/24	3rd	Gantry Girder: Design of gantry girder with all necessary checks	7/2/24	3rd	T1, R2	Smart board , ppt
54	03/01/24	3rd	Gantry Girder: Design of gantry girder with all necessary checks	9/2/24	3rd	T1, R2	Smart board , ppt
55	03/01/24	1st and 2nd	Gantry Girder: Design of gantry girder with all necessary checks	9/2/24	1st and 2nd	T1, R2	Smart board , ppt
56	04/01/24	3rd	Gantry Girder: Design of gantry girder with all necessary checks	12/2/24	3rd	T1, R2	Smart board , ppt
57	04/01/24	3rd	Gantry Girder: Design of gantry girder with all necessary checks	13/2/24	3rd	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	30/10/23
2	SEMINAR/QUIZ	18/12/23

**Text Books:**

1. N Krishna Raju, “Structural Design and Drawing of Reinforced Concrete and Steel”, University Press
2. Subramanian N, “Design of Steel Structures”, Oxford university Press, New Delhi
3. K S Duggal, “Design of Steel Structures”, Tata McGraw Hill, New Delhi

**Reference Book:**

1. Charles E Salman, Johnson & Mathas, “Steel Structure Design and Behavior”, Pearson Publications
2. Nether Cot, et.al, “Behavior and Design of Steel Structures to EC -III”, CRC Press
3. P C Verghese, “Limit State Design of Reinforced Concrete”, PHI Publications, New Delhi
4. S N Sinha, “Reinforced Concrete Design”, McGraw Hill Publication



**Head of the Department**  
Department of Civil Engineering  
The Oxford College of Engineering  
Bangalore-560 068.

Playana B. S

**Faculty**

**HOD**

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**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f))  
Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### **Name of the Department: CIVIL ENGINEERING**

### **LESSON PLAN**

**Faculty Name: GAYATHRI R**

**Academic Year: 2023-2024**

**SUB.CODE & Name: BCV303 / ENGINEERING GEOLOGY**

**Year/Sem/Section: 2<sup>ND</sup> / 3<sup>RD</sup>**

**COURSE OBJECTIVES** This course will enable the students to

CLO 1. To inculcate the importance of earth's interior and application of Geology in civil engineering in

Geo Hazard mitigation and management

CLO 2. To create awareness among Civil engineers regarding the resources of earth

CLO 3. To provide knowledge on dynamic Geology and its importance in modifying the physical character of rocks which cause rocks suitable or unsuitable in different civil engineering projects such as Dams, bridges, tunnels and highways.

CLO 4. To educate the ground water management regarding diversified geological formations, . To highlight the concept of rain water harvesting.

CLO 5. To understand the application of Remote Sensing and GIS, Natural disaster and management and environmental awareness. To understand the subsurface using geospatial data

### **COURSE OUTCOMES:**

<b>CO1</b>	<b>Apply geological knowledge in different civil engineering practice.</b>
<b>CO2</b>	<b>Acquire knowledge on durability and competence of foundation rocks, and will be able to use the best building materials.</b>
<b>CO3</b>	<b>Students will become competent enough for the safety, stability, economy and life of the structures that they construct</b>
<b>CO4</b>	<b>Able to solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems</b>
<b>CO5</b>	<b>Students will become Intelligent enough to apply GIS, GPS and remote sensing as a latest tool in different civil engineering for safe and solid construction.</b>

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Referen ce Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	16-11-2023	2 <sup>ND</sup>	Introduction, the scope of earth science in Engineering.	16-11-2023	2 <sup>ND</sup>	(T1)	Chalk and board
2.	20-11-2023	1 <sup>ST</sup>	Earth's internal structure and composition	20-11-2023	1 <sup>ST</sup>	(T1)	Chalk and board
3.	20-11-2023	1 <sup>ST</sup>	internal dynamics and Plate tectonics, Earthquakes - types, causes	20-11-2023	1 <sup>ST</sup>	(T1)	Chalk and board
4.	21-11-2023	3 <sup>RD</sup>	so-seismic lines, seismic zonation, seismic proof structures	21-11-2023	3 <sup>RD</sup>	(T1)	Chalk and board
5.	23-11-2023	2 <sup>ND</sup>	Volcanic eruption - types, causes. Landslides-causes types, preventive measures	23-11-2023	2 <sup>ND</sup>	(T1)	Chalk and board
6.	24-11-2023	2 <sup>ND</sup>	preventive measures	24-11-2023	2 <sup>ND</sup>	(T1)	Chalk and board
7.	27-11-2023	1 <sup>ST</sup>	Tsunami – causes, consequences, mitigation.	27-11-2023	1 <sup>ST</sup>	(T1)	Chalk and board
8.	28-11-2023	3 <sup>RD</sup>	Cyclones - causes and management.	28-11-2023	3 <sup>RD</sup>	(T1)	Chalk and board
9.	30-11-2023	2 <sup>ND</sup>	Cyclones - causes and management.	30-11-2023	2 <sup>ND</sup>	(T1)	Chalk and board
10.	04-12-2023	2 <sup>ND</sup>	vtu question revision	04-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
11.	05-12-2023	1 <sup>ST</sup>	Earth Materials in Construction	05-12-2023	1 <sup>ST</sup>	(T1)	Chalk and board
12.	06-12-2023	3 <sup>RD</sup>	Minerals -Industrial, rock-forming and ore minerals. Physical properties, composition.	06-12-2023	3 <sup>RD</sup>	(T1)	Chalk and board
13.	07-12-2023	2 <sup>ND</sup>	Rocks Types, structure/Texture, mineral composition occurrence, propertiesbending moment, Shear	07-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board

14.	11-12-2023	2 <sup>ND</sup>	railway ballast, rocks for masonry work	11-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
15.	11-12-2023	1 <sup>ST</sup>	monumental/architecture, Dressing of stones	11-12-2023	1 <sup>ST</sup>	(T1)	Chalk and board
16.	12-12-2023	3 <sup>RD</sup>	Requirement of good building stones.	12-12-2023	3 <sup>RD</sup>	(T1)	Chalk and board
17.	13-12-2023	2 <sup>ND</sup>	Requirement of good building stones.	13-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
18.	14-12-2023	2 <sup>ND</sup>	vtu question revision	14-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
19.	18-12-2023	1 <sup>ST</sup>	vtu question revision	18-12-2023	1 <sup>ST</sup>	(T1)	Chalk and board
20.	19-12-2023	3 <sup>RD</sup>	Earth Surface process and Resources	19-12-2023	3 <sup>RD</sup>	(T1)	Chalk and board
21.	20-12-2023	2 <sup>ND</sup>	Weathering, type, causes, soil insitu	20-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
22.	21-12-2023	2 <sup>ND</sup>	drifted soil, soil profile, soil mineralogy	21-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
23.	25-12-2023	1 <sup>ST</sup>	structure, types of soil	25-12-2023	1 <sup>ST</sup>	(T1)	Chalk and board
24.	25-12-2023	3 <sup>RD</sup>	Black cotton soil v/s Lateritic soil	25-12-2023	3 <sup>RD</sup>	(T1)	Chalk and board
25.	25-12-2023	2 <sup>ND</sup>	effects of weathering on monumental rocks	25-12-2023	2 <sup>ND</sup>	(T1)	Chalk and board
26.	26-12-2023		CIE 1	26-12-2023			
27.	27-12-2023		CIE 1	27-12-2023			
28.	28-12-2023		CIE 1	28-12-2023			
29.	29-12-2023		CIE 1	29-12-2023			
30.	01-01-2024	1 <sup>ST</sup>	effects of weathering on monumental rocks	01-01-2024	1 <sup>ST</sup>	(T1)	Chalk and board
31.	02-01-2024	3 <sup>RD</sup>	Soil Horizon	02-01-2024	3 <sup>RD</sup>	(T1)	Chalk and board
32.	04-01-2024	2 <sup>ND</sup>	Soil Classification by Grain Size.	04-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
33.	08-01-2024	2 <sup>ND</sup>	vtu question revision	08-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
34.	9-01-2024	1 <sup>ST</sup>	vtu question revision	9-01-2024	1 <sup>ST</sup>	(T1)	Chalk and board
35.	10-01-2024	3 <sup>RD</sup>	Surface and sub investigation for deep foundation	10-01-2024	3 <sup>RD</sup>	(T1)	Chalk and board
36.	11-01-2024	2 <sup>ND</sup>	Dip and strike	11-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
37.	15-01-2024	2 <sup>ND</sup>	outcrop problems(numerical problem geometrical/ simple trigonometry based)t	15-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board

38.	16-01-2024	1 <sup>ST</sup>	outcrop problems(numerical problem geometrical/ simple trigonometry based)	16-01-2024	1 <sup>ST</sup>	(T1)	Chalk and board
39.	17-01-2024	3 <sup>RD</sup>	outcrop problems(numerical problem geometrical/ simple trigonometry based)	17-01-2024	3 <sup>RD</sup>	(T1)	Chalk and board
40.	18-01-2024	2 <sup>ND</sup>	outcrop problems(numerical problem geometrical/ simple trigonometry based)	18-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
41.	22-01-2024	2 <sup>ND</sup>	Borehole data(and problems)	22-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
42.	23-01-2024	1 <sup>ST</sup>	Borehole data(and problems)	23-01-2024	1 <sup>ST</sup>	(T1)	Chalk and board
43.	25-01-2024	3 <sup>RD</sup>	Borehole data(and problems)	25-01-2024	3 <sup>RD</sup>	(T1)	Chalk and board
44.	26-01-2024	2 <sup>ND</sup>	Faults, folds	26-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
45.	29-01-2024	2 <sup>ND</sup>	unconformity, joints, types, recognition	29-01-2024	2 <sup>ND</sup>	(T1)	Chalk and board
46.	31-01-2024	1 <sup>ST</sup>	unconformity, joints, types, recognition	31-01-2024	1 <sup>ST</sup>	(T1)	Chalk and board
47.	01-02-2024	3 <sup>RD</sup>	significance in Civil engineering projects like tunnel project, dam project, Reservoir site,	01-02-2024	3 <sup>RD</sup>	(T1)	Chalk and board
48.	02-02-2024	2 <sup>ND</sup>	significance in Civil engineering projects like tunnel project, dam project, Reservoir site,	02-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
49.	05-02-2024	2 <sup>ND</sup>	significance in Civil engineering projects like tunnel project, dam project, Reservoir site,	05-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
50.	07-02-2024	1 <sup>ST</sup>	significance in Civil engineering projects like tunnel project, dam project, Reservoir site,	07-02-2024	1 <sup>ST</sup>	(T1)	Chalk and board
51.	08-02-2024	3 <sup>RD</sup>	vtu question revision	08-02-2024	3 <sup>RD</sup>	(T1)	Chalk and board
52.	12-02-2024	2 <sup>ND</sup>	vtu question revision	12-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
53.	13-02-2024	2 <sup>ND</sup>	Modern Tools and geophysical methods	13-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
54.	19-02-2024	1 <sup>ST</sup>	Rocks as aquifers, water-bearing properties igneous	19-02-2024	1 <sup>ST</sup>	(T1)	Chalk and board
55.	21-02-2024	1 <sup>ST</sup>	sedimentary and metamorphic rocks	21-02-2024	1 <sup>ST</sup>	(T1)	Chalk and board
56.	22-02-2024	3 <sup>RD</sup>	coefficient of permeability	22-02-2024	3 <sup>RD</sup>	(T1)	Chalk and board
57.	26-02-2024	2 <sup>ND</sup>	factors affecting permeability	26-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board
58.	27-02-2024	2 <sup>ND</sup>	Electrical Resistivity meter	27-02-2024	2 <sup>ND</sup>	(T1)	Chalk and board

59.	29-02-2024	1 <sup>ST</sup>	Electrical Resistivity meter	29-02-2024	1 <sup>ST</sup>	(T1)	Chalk and board
60.	01-03-2024	3 <sup>RD</sup>	r, depth of water table, (numerical problems), seismic studies.	01-03-2024	3 <sup>RD</sup>	(T1)	Chalk and board
61.	02-03-2024		CIE 2	02-03-2024			
62.	03-03-2024		CIE 2	03-03-2024			
63.	04-03-2024		CIE 2	04-03-2024			
64.	05-03-2024		CIE 2	05-03-2024			

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list	03-01-2024
2	CCE-2 from the above list	25-02-2024

### Text Books:

1. Introduction to Environmental Geology by Edward A Keller, Pearson publications.
2. Engineering Geology and Rock Mechanics B. P. Verma, Khanna publishers
3. Principles of Engineering Geology and Geotechnics, Krynine and Judd, CBS Publications

### Reference Book:

1. Engineering Geology, by Parthasarathy et al, Wiley publications



2. A textbook of Engineering Geology by ChennaKesavulu, Mac Millan India Ltd



**Faculty**



**Head of the Department**  
Department of Civil Engineering  
The Oxford College of Engineering  
Bangalore - 560 068.

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**THE OXFORD COLLEGE OF ENGINEERING**  
**HOSUR ROAD, BOMMANAHALLI, BANGALORE- 68**  
 Department of Electronics and Communication Engineering

**Lesson Plan**

Date: 15-11-2023

Subject code : BEC303  
 Subject Title : Electronic Principles and Circuits  
 Course / Branch : BE / ECE  
 Semester : III - B  
 Academic Year : 2023-24  
 Faculty Name : Tina Elizabeth Thomas

**Course Learning Objectives:** This course will enable students to :

- CLO 1. Design and analyze the BJT circuits as an amplifier and voltage regulation
- CLO 2. Design of MOSFET Amplifiers and analyze the basic amplifier configurations using small signal equivalent circuit models
- CLO 3. Design of operational amplifiers circuits as Comparators, DAC and filters.
- CLO 4: Understand the concept of positive and negative feedback.
- CLO 5: Analyze Power amplifier circuits in different modes of operation.
- CLO 6: Construct Feedback and Oscillator circuits using FET.
- CLO 7: Understand the thyristor operation and the different types of thyristors.

Module	Topic No.	Date	Topic	Period	Books Referred & Page No's
1	1.	15-11-23	<b>Transistor Biasing:</b> Voltage Divider Bias,	5	T1:262-264
1	2.	17-11-23	VDB Analysis, VDB Load line and Q point,	2	T1:264-269
1	3.	20-11-23	Two supply Emitter Bias, Other types of Bias.	1	T1:269-275
1	4.	21-11-23	<b>BJT AC models:</b> Base Biased Amplifier,	3	T1:288-292
1	5.	22-11-23	Emitter Biased Amplifier,	5	T1:293-295
1	6.	24-11-23	Small Signal Operation, AC Beta, AC Resistance of the emitter diode,	2	T1:296-302
1	7.	27-11-23	Two transistor models, Analyzing an amplifier,	1	T1:303-308
1	8.	28-11-23	H parameters, Relations between R and H parameters.	3	T1:309-311
1	9.	29-11-23	<b>Voltage Amplifiers:</b> Voltage gain, Loading effect of Input Impedance.	5	T1:320-326
1	10.	1-12-23	<b>CC Amplifiers:</b> CC Amplifier, Output Impedance.	2	T1:346-354
2	11.	4-12-23	<b>MOSFET:</b> <b>Biasing in MOS amplifier circuits:</b> Fixing VGS,	1	T2:370-371
2	12.	5-12-23	Fixing VG, Drain to Gate feedback resistor.	3	T2:371-375
2	13.	6-12-23	<b>Small signal operation and modelling:</b> The DC bias point,	5	T2:377-379
2	14.	8-12-23	signal current in drain, voltage gain,	2	T2:379-380
2	15.	9-12-23	small signal equivalent circuit models, transconductance,	2	T2:380-385
2	16.	11-12-23	The T equivalent circuit model.	1	T2:385-386
2	17.	12-12-23	<b>MOSFET Amplifier configuration:</b> Basic configurations,	3	T2:389-391

2	18.	13-12-23	characterizing amplifiers,	5	T2:391-395
2	19.	15-12-23	CS amplifier with and without source resistance,	2	T2:396-401
2	20.	18-12-23	The Common Gate Amplifier, Source follower.	1	T2:401-408
3	21.	19-12-23	<b>Linear Op Amp Circuits:</b> Summing Amplifier and D/A Converter, ,	3	T1:757-762
3	22.	20-12-23	Nonlinear Op-amp Circuits: Comparator with zero reference	5	T1:844-850
3	23.	22-12-23	Comparator with non-zero references.	2	T1:851-856
3	24.	23-12-23	Comparator with Hysteresis.	1	T1:856-861
3	25.	30-12-23	<b>Oscillator:</b> Theory of Sinusoidal Oscillation,	2	T1:892-893
3	26.	1-1-24	The Wein-Bridge Oscillator, RC Phase Shift Oscillator,	1	T1:893-898
3	27.	2-1-24	The Colpitts Oscillator,	3	T1:900-905
3	28.	3-1-24	Hartley Oscillator, Crystal Oscillator.	5	T1:906-908
3	29.	5-1-24	<b>The 555 timer:</b> Monostable Operation,	2	T1:912-919
3	30.	8-1-24	Astable Operation.	1	T1:919-923
4	31.	9-1-24	<b>Negative Feedback:</b> Four Types of Negative Feedback,	3	T1:706-707
4	32.	10-1-24	VCVS Voltage gain, Other VCVS Equations,	5	T1:707-714
4	33.	12-1-24	ICVS Amplifier, VCIS Amplifier, ICIS Amplifier	2	T1:715-721
4	34.	13-1-24	<b>Active Filters:</b> Ideal Responses,	2	T1:784-787
4	35.	16-1-24	First Order Stages,	3	T1:803-807
4	36.	17-1-24	VCVS Unity Gain Second Order Low pass Filters,	5	T1:807-813
4	37.	19-1-24	VCVS Equal Component Low Pass Filters,	2	T1:816-819
4	38.	22-1-24	VCVS High Pass Filters,	1	T1:819-822
4	39.	23-1-24	MFB Bandpass Filters,	3	T1:822-826
4	40.	24-1-24	Bandstop Filters.	5	T1:826-828
5	41.	27-1-24	<b>Power Amplifiers:</b> Amplifier terms,	5	T1:378-380
5	42.	29-1-24	Two load lines,	1	T1:380-385
5	43.	30-1-24	Class A Operation,	3	T1:385-392
5	44.	31-1-24	Class B operation, Class B push pull emitter follower,	5	T1:392-396
5	45.	2-2-24	Class C Operation.	2	T1:403-406
5	46.	5-2-24	<b>Thyristors:</b> The four layer Diode,	1	T1:522-525
5	47.	6-2-24	SCR,	3	T1:526-534
5	48.	7-2-24	SCR Phase control,	5	T1:537-541
5	49.	9-2-24	Bidirectional Thyristors,	2	T1:541-547
5	50.	12-2-24	IGBTs, Other Thyristors.	1	T1:547-554

Exp. No	Date of Experiment	Name of Experiment
1.	22-11-23	a. Design and Test Bridge Rectifier with Capacitor Input Filter
	29-11-23	b. Design and Test Zener voltage regulator
2.	6-12-23	a. Design and Test Biased Clippers – a) Positive, b) Negative , c) Positive-Negative
	13-12-23	b. Design and Test Positive and Negative Clampers with and without Reference.
3.	20-12-23	To plot the transfer and drain characteristics of a JFET and calculate its drain resistance, mutual conductance and amplification factor.
4.	3-1-24	Plot the transfer and drain characteristics of n-channel MOSFET and calculate its parameters, namely; drain resistance, mutual conductance and amplification

		factor.
5.	10-1-24	To Design and Test Emitter Follower
6.	17-1-24	To Design and plot the frequency response of Common Source JFET/MOSFET amplifier.
7.	24-1-24	To Test the Op-amp Comparator with zero and non-zero reference and obtain the Hysteresis curve.
8.	31-1-24	Design and test Full wave Controlled Rectifier using RC triggering circuit.
9.	7-2-24	To Design and test Precision Half wave and full wave rectifiers using Opamp.
10.	14-2-24	Design and test RC phase shift oscillator

No. of stipulated hours: 50

No. of hours planned: 50

**Course outcomes (Course Skill Set):** After studying this course, students will be able to:

- Design and analyze the BJT circuits as an amplifier and voltage regulation.
- Design of MOSFET Amplifiers and analyse the basic amplifier configurations using small signal equivalent circuit model
- Understand the feedback topologies and approximations in the design of amplifiers and oscillators.
- Design of circuits using linear ICs for wide range applications such as ADC, DAC, filters and timers.
- Understand the power electronic device components and its functions for basic power electronic circuits.

**Self-study Topics (Not included in Syllabus):**

Sl. No.	Self-study Topics	Suggested Reference
1.	Working of BJT & MOSFET	Electronic Devices and Circuits, David A Bell, 5th Edition, Oxford, 2016
2.	Operational Amplifier Basics	Op-amps and Linear Integrated Circuits, Ramakanth A Gayakwad Pearson Education, 4th Edition

**Assignment Topics:**

Sl. No.	Assignment Topics	Submission due on
1.	Filters and Feedbacks	1-3-2024
2.	BJT & MOSFET Amplifiers (Quiz)	7-3-2024

**Text Books:**

1. Albert Malvino, David J Bates, Electronic Principles, 7th Edition, Mc Graw Hill Education, 2017, ISBN:978-0-07-063424-4.
2. Microelectronic Circuits, Theory and Applications, Adel S Sedra, Kenneth C Smith, 6th Edition, Oxford, 2015. ISBN:978-0-19-808913-1.



Faculty



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CHILDREN'S EDUCATION SOCIETY (Regd.)

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## THE OXFORD COLLEGE OF ENGINEERING

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### Department of ECE

### LESSON PLAN

**Faculty Name: Dr Suchandana Mishra**

**Academic Year: 2023-2024**

**SUB.CODE & Name: BEC405A & 8051 MICROCONTROLLER**

**Year/Sem/Section: II/IV/A**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Understand the difference between Microprocessor and Microcontroller and embedded microcontrollers.

CLO2. Analyze the basic architecture of 8051 microcontroller.

CLO3. Program 8051 microprocessor using Assembly Level Language and C.

CLO4. Understand the operation and use of inbuilt Timers/Counters and Serial port of 8051.

CLO5. Understand the interrupt structure of 8051 and Interfacing I/O devices using I/O ports of 8051.

### **COURSE OUTCOMES:**

<b>CO1</b>	Describe the difference between Microprocessor and Microcontroller, Types of Processor Architectures and Architecture of 8051 Microcontroller
<b>CO2</b>	Discuss the types of 8051 Microcontroller Addressing modes & Instructions with Assembly Language Programs.
<b>CO3</b>	Explain the programming operation of Timers/Counters and Serial port of 8051 Microcontroller.
<b>CO4</b>	Illustrate the Interrupt Structure of 8051 Microcontroller & its programming.
<b>CO5</b>	Develop C programs to interface I/O devices with 8051 Microcontroller.



SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	24/4/24	2	<b>MODULE 1: 8051 Microcontroller:</b>	24/4/24	2	T1:1.1	L1, L2, L3
2.	25/4/24	4	Introduction	25/4/24	4	T1:1.1	L1, L2, L3
3.	26/4/24	1	Microprocessor Vs Microcontroller	26/4/24	1	T2:1.0	L1, L2, L3
4.	27/4/24	3,6	Embedded Systems	27/4/24	3,6	T2:1.1	L1, L2, L3
5.	29/4/24	2	Embedded Microcontrollers	30/4/24	2	T2:1.2	L1, L2, L3
6.	30/4/24	5	8051 Architecture- Registers	30/4/24	4	T2:3.0	L1, L2, L3
7.	2/5/24	1	Pin diagram	2/5/24	2	T2:3.1	L1, L2, L3
8.	3/5/24	3,6	I/O ports functions	4/5/24	3,6	T2:3.2	L1, L2, L3
9.	6/5/24	4	Internal Memory organization.	8/5/24	2	T2:3.3	L1, L2, L3
10.	7/5/24	6	External Memory (ROM & RAM) interfacing	8/5/24	4	T2:3.3	L1, L2, L3
11.							L1, L2, L3
12.	8/5/24	3,6	<b>MODULE 2: 8051 Instruction Set:</b>	9/5/24	3,6	T2:5.2	L1, L2, L3
13.	9/5/24	1	Addressing Modes	11/5/24	1	T2:5.3	L1, L2, L3
14.	13/5/24	2	Data Transfer instructions	13/5/24	2	T2:5.4	L1, L2, L3
15.	14/5/24	3,6	Arithmetic instructions	14/5/24	3,6	T2:5.5	L1, L2, L3
16.	15/5/24	1,2	Logical instructions	15/5/24	1,2	T2:6.1	L1, L2, L3
17.	16/5/24	4	Branch instructions	16/5/24	4	T2:6.2	L1, L2, L3
18.	20/5/24	5	Bit manipulation instructions	20/5/24	5	T2:6.3	L1, L2, L3
19.	21/5/24	3,6	Simple Assembly language program examples (without loops) to use these instructions	21/5/24	3,6	T2:6.4	L1, L2, L3
20.	22/5/24	1	Simple Assembly language program examples	22/5/24	1	T2:7.1	L1, L2, L3
21.	23/5/24	2	Programs	23/5/24	2	T2:7.2	L1, L2, L3

22.	27/5/24	3,6	Programs	27/5/24	3,6	T2:7.3	L1, L2, L3
23.	28/5/24	2	Programs	28/5/24	1	T2:7.4	L1, L2, L3
24.							
25.	29/5/24	2	<b><u>MODULE 3 Timers/Counters &amp; Serial port programming:</u></b>	29/5/24	2	T1:7.1	L1, L2, L3
26.	30/5/24	3,6	Basics of Timers & Counters	30/5/24	3,6	T2:7.2	L1, L2, L3
27.	3/6/24	4	Data types & Time delay in the 8051 using C	3/6/24	1	T2:7.3	L1, L2, L3
28.	4/6/24	2	Programming 8051 Timers	4/6/24	2	T2:9.1	L1, L2, L3
29.	5/6/24	3,6	Mode 1 & Mode 2 Programming	5/6/24	3,6	T2:9.2	L1, L2, L3
30.	18/6/24	1	Counter Programming (Assembly Language only)	18/6/24	1	T2:9.3	L1, L2, L3
31.	19/6/24	2	Basics of Serial Communication	19/6/24	2	T2:10.1	L1, L2, L3
32.	20/6/24	3,6	Connection to RS232	20/6/24	3,6	T2:10.2	L1, L2, L3
33.	20/6/24	1	Programming the 8051 to transfer data serially & to receive data serially using C	20/6/24	1	T2:10.3	L1, L2, L3
34.							
35.	24/6/24	2	<b><u>MODULE 4: Interrupt Programming:</u></b>	24/6/24	2	T2: 11.1	L1, L2, L3
36.	25/6/24	3,4	Basics of Interrupts	25/6/24	3,4	T1: 11.1	L1, L2, L3
37.	26/6/24	1	8051 Interrupts	26/6/24	1	T1: 11.1	L1, L2, L3
38.	27/6/24	2	Programming Timer Interrupts	27/6/24	2	T1: 11.2	L1, L2, L3
39.	1/7/24	3,4	Programming Serial Communication Interrupts	1/7/24	3,4	T1: 11.2	L1, L2, L3
40.	2/7/24	1	Basics of Serial Data Communication	2/7/24	1	T1: 11.4	L1, L2, L3
41.	3/7/24	2	Program	3/7/24	2	T1: 11.4	L1, L2, L3
42.	4/7/24	3,4	9 pin RS232 signals	4/7/24	3,4	T1: 11.5	L1, L2, L3
43.	8/7/24	1	Interrupt Priority in 8051(Assembly Language only)	8/7/24	1	T1: 11.5	L1, L2, L3
44.	9/7/24	2	Program	9/7/24	2	T1: 11.5	L1, L2, L3
45.							
46.	11/7/24	1	<b><u>MODULE 5: I/O Port Interfacing &amp; Programming:</u></b>	11/7/24	1	T1:7.2	L1, L2, L3

47.	15/7/24	2	I/O Programming in 8051 C	15/7/24	2	T1:12.1	L1, L2, L3
48.	16/7/24	3,4	LCD interfacing	16/7/24	3,4	T1:13.1	L1, L2, L3
49.	18/7/24	3	DAC 0808 Interfacing	18/7/24	1	T1:13.2	L1, L2, L3
50.	22/7/24	2	ADC 0804 interfacing,	22/7/24	2	T1:13.2	L1, L2, L3
51.	23/7/24	3,4	Stepper motor interfacing	23/7/24	3,4	T1:17.2	L1, L2, L3
52.	23/7/24	2	DC motor control & Pulse Width Modulation (PWM) using C only.	23/7/24	1	T1:17.3	L1, L2, L3
53.	24/7/24	3	Programs	24/7/24	3	T1:17.3	L1, L2, L3

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

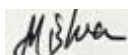
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list	20/6/24
2	CCE-2 from the above list	20/7/24

#### Text Books:

1. "The 8051 Microcontroller and Embedded Systems – using assembly and C ", Muhammad Ali Mazidi and Janice Gillespie Mazidi and Rollin D. McKinlay; PHI, 2006 / Pearson, 2006.
2. "The 8051 Microcontroller", Kenneth J. Ayala, 3 rd Edition, Thomson/ Cengage Learning.

#### Reference Book:

1. "The 8051 Microcontroller Based Embedded Systems", Manish K Patel, McGraw Hill, 2014, ISBN: 978-93-329-0125-4.
2. "Microcontrollers: Architecture, Programming, Interfacing and System Design" , Raj Kamal, Pearson Education, 2005.

  
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THE OXFORD COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

(Approved by AICTE, New Delhi, Accredited by NAAC-A Grade & NBA, New Delhi & Affiliated to VTU, Belgaum)

### Lesson Plan

**Faculty Name:** SHEEBA KUMARI.C

**Academic Year:** 2023-24

**SUB.CODE & Name:** VLSI Design( 18EC72)

**Year/Sem/Section:** 7<sup>TH</sup> SEM

**COURSE LEARNING OBJECTIVES:** This course will enable students to:

CLO1: Impart knowledge of MOS transistor theory and CMOS technologies.

CLO2: Learn the operation principles and analysis of inverter circuits.

CLO3: Design Combinational, Sequential, and dynamic logic circuits as per the requirements.

CLO4: Infer the operation of Semiconductors memory circuits.

CLO5: Demonstrate the concepts of CMOS testing.

**COURSE OUTCOMES:** At the completion of the course the student will be able to:

CO1. Demonstrate understanding of MOS transistor theory, MOS fabrication flow and technology scaling.

CO2. Draw the basic gates using the stick and layout diagram with the knowledge of physical design aspects.

CO3. Demonstrate ability to design Combinational, Sequential and Dynamic logic circuits as per the requirements.

CO4. Interpret memory elements along with timing considerations

CO5. Interpret testing and testability issues in VLSI Design.

S. no	Planned		Topics to be covered	Execution		Books referred	Pedagogy
	Date	Hr		Date	Hr		
1.	19-9-2023	3	<b>A Brief History:</b> MOS Transistors	19-9-2023	3	TB1	Chalk and talk
2.	20-9-2023	3	Nmos, Pmos Logic	20-9-2023	3	TB1	Chalk and talk
3.	21-9-2023	1	CMOS Logic, Nand gate, NOR CMOS Logic gate implementation	21-9-2023	1	TB1	Chalk and talk
4.	22-9-2023	3	Pass transistors, Transmission gates	22-9-2023	3	TB1	Chalk and talk
5.	26-9-2023	1	Tristate buffer, Multiplexer	26-9-2023	1	TB1	Chalk and talk
6.	27-9-2023	3	MOS Transistor Theory: Introduction	27-9-2023	3	TB1:	Chalk and talk
7.	28-9-2023	1	Long Channel, I-V Characteristics	28-9-2023	1	TB1	Chalk and talk
8.	29-9-2023	3	Non-ideal I-V Effects	29-9-2023	3	TB1	Chalk and talk



9	03-10-2023	1	DC Transfer Characteristics	03-10-2023	1	TB1	Chalk and talk
10	04-10-2023	3	<b>FABRICATION:</b> CMOS Fabrication, Inverter Cross section	04-10-2023	3	TB1	Chalk and talk
11	05-10-2023	1	p-well, n-well and twin tub process	05-10-2023	1	TB1	Chalk and talk
12	06-10-2023	3	Layout design Rules, Gate layout, Stick diagram	06-10-2023	3	TB1	Chalk and talk
13	10-10-2023	1	VLSI Design Flow, Timing Simulation	10-10-2023	1	TB1	Chalk and talk
14	11-10-2023	3	Introduction CMOS Technologies	11-10-2023	3	TB1	Chalk and talk
15	12-10-2023	1	Layout Design Rules, Lambda rules	12-10-2023	1	TB1	Chalk and talk
16	13-10-2023	3	<b>MOSFET Scaling</b>	13-10-2023	3	TB1	Chalk and talk
17	17-10-2023	1	Current density, power dissipation per gate	17-10-2023	1	TB1	Chalk and talk
18	18-10-2023	3	Switching energy per gate	18-10-2023	3	TB1	Chalk and talk
19	19-10-2023	3	Small-Geometry Effects	19-10-2023	3	TB1	Chalk and talk
20	20-10-2023	1	MOSFET Capacitances	20-10-2023	1	TB1	Chalk and talk
21	31-10-2023	3	<b>Delay:</b> Introduction, Transient Response	31-10-2023	3	TB1	Chalk and talk
22	02-11-2023	1	RC Delay Model	02-11-2023	1	TB1	Chalk and talk
23	03-11-2023	3	Delay Model	03-11-2023	3	TB1	Chalk and talk
24	07-11-2023	3	Linear Delay Model	07-11-2023	3	TB2	Chalk and talk
25	08-11-2023	1	Logical Efforts of Paths, Parasitic delay	08-11-2023	1	TB2	Chalk and talk
26	09-11-2023	3	<b>Combinational Circuit Design:</b> Introduction	09-11-2023	3	TB2	Chalk and talk
27	10-11-2023	1	Circuit families: Static CMOS	10-11-2023	1	TB2	Chalk and talk
28	14-11-2023	3	Ratioed Circuits	14-11-2023	3		Chalk and talk
29	15-11-2023	1	Cascade Voltage Switch Logic	15-11-2023	1	TB2	Chalk and talk
30	16-11-2023	3	Dynamic Circuits, Pass transistor circuits	16-11-2023	3	TB2	Chalk and talk
31	17-11-2023	1	<b>Sequential Circuit Design:</b> Introduction	17-11-2023	1	TB2	Chalk and talk
32	21-11-2023	3	Sequencing Static Circuits: Sequencing methods	21-11-2023	3	TB2	Chalk and talk
33	22-11-2023	1	Max-Delay Constraints, IN delay Constraints	22-11-2023	1	TB2	Chalk and talk
34	23-11-2023	3	Time Borrowing, Clock skew	23-11-2023	3	TB2	Chalk and talk
35	24-11-2023	1	Circuit Design for Latches and flip flops	24-11-	1	TB2	Chalk and talk

				2023			
36	28-11-2023	3	Pulsed latches, Resettable, Enables Latches & FF's	28-11-2023	3	TB2	Chalk and talk
37	29-11-2023	1	Incorporating logic into latches, Differential FFs	29-11-2023	1	TB2	Chalk and talk
38	30-11-2023	3	<b>Dynamic Logic Circuits:</b> Introduction	30-11-2023	3	TB1 TB2	Chalk and talk
39	01-12-2023	3	Basic Principles	01-12-2023	3	TB1 TB2	Chalk and talk
40	05-12-2023	1	Basic Principles of Pass Transistor Circuits	05-12-2023	1	TB1 TB2	Chalk and talk
41	06-12-2023	3	Synchronous Dynamic Circuit Techniques	06-12-2023	3	TB1 TB2	Chalk and talk
42	07-12-2023	1	Dynamic CMOS Circuit Techniques	07-12-2023	1	TB1 TB2	Chalk and talk
43	08-12-2023	1	<b>Semiconductor Memories:</b> Introduction	08-12-2023	1	TB1 TB2	Chalk and talk
44	12-12-2023	3	Dynamic Random Access Memory (DRAM)	12-12-2023	3	TB1 TB2	Chalk and talk
45	13-12-2023		Static Random Access Memory	13-12-2023		TB1 TB2	Chalk and talk
46	14-12-2023		Pseudo – Static RAM	14-12-2023		TB1 TB2	Chalk and talk
47	15-12-2023		Register Cell	15-12-2023		TB1 TB2	Chalk and talk
48	19-12-2023		<b>Testing and Verification:</b> Introduction	19-12-2023		TB1 TB2	Chalk and talk
49	20-12-2023		Logic Verification Principles	20-12-2023		TB1 TB2	Chalk and talk
50	21-12-2023		Manufacturing Test Principles	21-12-2023		TB1 TB2	Chalk and talk
51	22-12-2023		Design for testability	22-12-2023		TB1 TB2	Chalk and talk
52	26-12-2023		Scan Design, Circuit Design of Scalable elements	26-12-2023		TB1 TB2	Chalk and talk
53	02-01-24		BIST, IDDQ Testing	02-01-24		TB1 TB2	Chalk and talk
54	03-01-24		Design for Manufacturability	03-01-24		TB1 TB2	Chalk and talk
55	04-01-24		Revision 1	04-01-24		TB1 TB2	Chalk and talk
56	05-01-24		Revision 2	05-01-24		TB1 TB2	Chalk and talk
57	06-01-24		Revision 3	06-01-24		TB1 TB2	Chalk and talk

Assignment Topics
1. Assignment on MOSFET
2. Assignment on CMOS
3. Assignment on FLIP FLOPD

**Textbooks:**

1. **“CMOS Digital Integrated Circuits: Analysis and Design”** -Sung Mc Kang & Yosuf Leblebici, Third Edition, Tata McGraw -Hill.
2. **“CMOS VLSI Design”- A Circuits and Systems Perspective”**-Neil H.E Weste and David Money Harris 4<sup>th</sup> Edition, Pearson Education.

**Reference Books:**

1. Adel Sedra and K.C Smith.” **Microelectronics Circuits Theory and Applications”**,6<sup>th</sup> or 7<sup>th</sup> Edition, Oxford University Press, International version 2009.
2. Douglas A Puck Nell & Kamran Eshragian,” **Basic VLSI Design”**, PHI 3<sup>rd</sup> Edition, (original edition-1994)
3. Behzad Razavi,” **CMOS Design of Analog Integrated Circuits”**, TMH,2007.



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### Name of the Department

### LESSON PLAN

**Faculty Name: Dr. K THARAKA RAMI REDDY**

**Academic Year: 2023-24**

**SUB.CODE & Name: 22MBA15/ MARKETING MANAGEMENT**

**Year/Sem/Section: 1<sup>st</sup> Year/ 1<sup>st</sup> Semester/ A- Section**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To make students understand the fundamental concepts of marketing and environment in which marketing system operates.

CLO2: To gain knowledge on consumer buying behaviour and influencing factors

CLO3: To describe major bases for segment marketing, target marketing, and market positioning.

CLO4: To develop a Conceptual framework, covering basic elements of the marketing mix.

CLO5: To understand fundamental premise underlying market driven strategies and hands on practical approach.

**COURSE OUTCOMES:** At the end of the course the student will be able to:

CO1	Comprehend the concepts of Marketing Management
CO2	Gain knowledge on consumer behaviour and buying process
CO3	Understand concept of Product and Brand Management, Branding and Pricing strategies
CO4	Identify marketing channels and the concept of product distribution, techniques of sales promotion
CO5	Simply ideas into a viable marketing plan for various modes of marketing

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	12/02/24	1	Introduction to Marketing: Importance of marketing, Definitions of market and marketing, Types of Needs.	12/02/24	1	T1, R2	Smart board , ppt



2.	13/02/24	3	Elements of Marketing Concept, Functions of Marketing,	13/02/24	3	T1, R2	Smart board , ppt
3.	14/02/24	3	evolution of marketing , Marketing V/s Selling	14/02/24	3	T1, R2	Smart board , ppt
4.	16/02/24	3	Customer Value and Satisfaction, 4P's of Marketing	16/02/24	3	T1, R2	Smart board , ppt
5.	19/02/24	1	Marketing Environment	19/02/24	1	T1, R2	Smart board , ppt
6.	20/02/24	3	Marketing Environment	20/02/24	3	T1, R2	Smart board , ppt
7.	21/02/24	3	Techniques used in environment analysis, Characteristics (Micro and Macro), Marketing to the 21st century customer.	21/02/24	3	T1, R2	Smart board , ppt
8.	23/02/24	3	Analysing Consumer Behaviour: Meaning and Characteristics, Importance of consumer behaviour	23/02/24	3	T1, R2	Smart board , ppt
9.	24/02/24	1	Factors influencing Consumer Behaviour	24/02/24	1	T1, R2	Smart board , ppt
10	26/02/24	3	Consumer characteristics influencing buying behaviour	26/02/24	3	T1, R2	Smart board , ppt
11	27/02/24	3	personal factors and cultural factors	27/02/24	3	T1, R2	Smart board , ppt
12	28/02/24	3	Consumer Buying Decision Process, Buying Roles,	28/02/24	3	T1, R2	Smart board , ppt
13	01/03/24	1	Buying Motives	01/03/24	1	T1, R2	Smart board , ppt
14	04/03/24	3	The black box model of consumer behaviour.	04/03/24	3	T1, R2	Smart board , ppt
15	05/03/24	3	Psychological factors consumer	05/03/24	3	T1, R2	Smart board , ppt
16	06/03/24	3	Psychological factors consumer	06/03/24	3	T1, R2	Smart board , ppt
17	09/03/24	1	Product management and Pricing: Importance and primary objective of product management	09/03/24	1	T1, R2	Smart board , ppt
18	11/03/24	3	product levels, product hierarchy	11/03/24	3	T1, R2	Smart board , ppt
19	12/03/24	3	Classification of products ,product mix, product mix strategies	12/03/24	3	T1, R2	Smart board , ppt
20	18/03/24	3	Managing Product Life Cycle, New Product Development	18/03/24	3	T1, R2	Smart board , ppt
21	19/03/24	1	packing as a marketing tool, Role of labeling in packing, Concept of Branding, Brand Equity	19/03/24	1	T1, R2	Smart board , ppt
22	20/03/24	3	branding strategies, selecting logo, brand extension- effects	20/03/24	3	T1, R2	Smart board , ppt
23	22/03/24	3	Introducing to pricing, Significance of pricing	22/03/24	3	T1, R2	Smart board , ppt
24	25/03/24	3	factor influencing pricing, objectives	25/03/24	3	T1, R2	Smart



							board , ppt
25	26/03/24	1	Pricing Strategies, Value based Pricing ,Cost based Pricing, Market based Pricing, Competitor based Pricing, Pricing Procedure	26/03/24	1	T1, R2	Smart board , ppt
26	27/03/24	3	Case study	27/03/24	3	T1, R2	Smart board , ppt
27	30/03/24	3	<b>Distribution and Promotion:</b> Roles and purpose of Marketing Channels, Factors Affecting Channel Choice	30/03/24	3	T1, R2	Smart board , ppt
28	01/04/24	3	Channel Design	01/04/24	3	T1, R2	Smart board , ppt
29	02/04/24	1	Channel Management Decision, Channel Conflict, Designing a physical Distribution System	02/04/24	1	T1, R2	Smart board , ppt
30	03/04/24	3	Promotions-Marketing communications- IMC- objectives, steps in developing effective communication.	03/04/24	3	T1, R2	Smart board , ppt
31	05/04/24	3	Advertising: Advertising Objectives	05/04/24	3	T1, R2	Smart board , ppt
32	08/04/24	3	Advertising Budget, Advertising Copy	08/04/24	3	T1, R2	Smart board , ppt
33	10/04/24	1	AIDA model	10/04/24	1	T1, R2	Smart board , ppt
34	12/04/24	3	Traditional Vs Modern Media- Online and Mobile Advertising	12/04/24	3	T1, R2	Smart board , ppt
35	13/04/24	3	social media for Advertising. Push-pull strategies of promotion.	13/04/24	3	T1, R2	Smart board , ppt
36	15/04/24	3	Market segmentation, Targeting and Brand Positioning: Concept of Market Segmentation, Benefits	15/04/24	3	T1, R2	Smart board , ppt
37	16/04/24	1	Requisites of Effective Segmentation,	16/04/24	1	T1, R2	Smart board , ppt
38	22/04/24	3	Bases for Segmenting Consumer Markets,	22/04/24	3	T1, R2	Smart board , ppt
39	23/04/24	3	Market Segmentation Strategies. Types of Segmentation	23/04/24	3	T1, R2	Smart board , ppt
40	24/04/24	3	Targeting -Bases for identifying target Customer, Target Marketing strategies	24/04/24	3	T1, R2	Smart board , ppt
41	26/04/24	1	Positioning - Meaning, Tasks involved in Positioning.	26/04/24	1	T1, R2	Smart board , ppt
42	27/04/24	3	Monitoring brands performance and positioning	27/04/24	3	T1, R2	Smart board , ppt
43	29/04/24	3	Product Differentiation Strategies.	29/04/24	3	T1, R2	Smart board , ppt
44	30/04/24	3	Emerging Trends in Marketing: Marketing Planning. Concepts of B2B	30/04/24	3	T1, R2	Smart board , ppt

			marketing, Service Marketing, Digital and social media Marketing				
45	03/05/24	1		03/05/24	1	T1, R2	Smart board , ppt
46	06/05/24	3	Green Marketing, Event Marketing, Marketing Audit,	06/05/24	3	T1, R2	Smart board , ppt
47	07/05/24	3	Sponsorship, Cause Related Marketing	07/05/24	3	T1, R2	Smart board , ppt
48	08/05/24	3	Marketing for Non-Profit Organizations, Relationship marketing	08/05/24	3	T1, R2	Smart board , ppt
49	11/05/24	1	Marketing Strategies for Leaders, Challengers, Followers and Startups.	11/05/24	1	T1, R2	Smart board , ppt
50	13/05/24	3	Social Responsibility of marketing	13/05/24	3	T1, R2	Smart board , ppt
51	14/05/24	3	Revision on Module 2	14/05/24	3	T1, R2	Smart board , ppt
52	15/05/24	3	Revision on Module 2	15/05/24	3	T1, R2	Smart board , ppt
53	17/05/24	1	Revision on Module 3	17/05/24	1	T1, R2	Smart board , ppt
54	24/05/24	3	Revision on Module 5	24/05/24	3	T1, R2	Smart board , ppt
55	25/05/24	3	Revision on Module 6	25/05/24	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-Integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

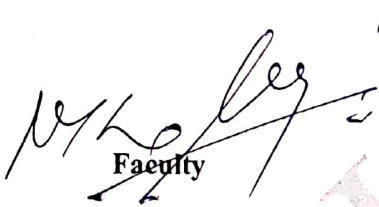
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list: Assignment	30/03/2024
2	CCE-2 from the above list: Class Room Presentations	29,30/04/2024

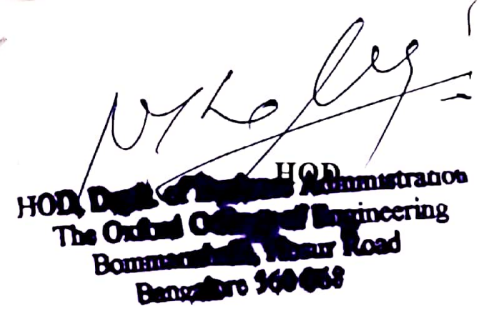
**Text Books:**

1. Marketing Management- Indian Context, Global Perspective by Ramaswamy & Namakumari by SAGE publication, 6th Edition.
2. Marketing Management: A South Asian Perspective by Kotler, Keller, Koshy & Jha by Pearson publication, Latest Edition

**Reference Book:**

1. Marketing by Lamb, Hair, Mc Danniel by Cengage Learning, Latest edition.
2. Fundamentals of Marketing Management, Etzel M J B J Walker & William J Stanton by Tata Macgraw Hill, Latest edition.

  
Faculty

  
HOD, Dept. of Business Administration  
The Oxford College of Engineering  
Bommasandra, Mysur Road  
Bangalore 560 069





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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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## **THE OXFORD COLLEGE OF ENGINEERING**

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☎: 080-61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Name of the Department: MBA**

### **LESSON PLAN**

**Faculty Name: DR. K THARAKA RAMI REDDY**

**Academic Year: 2023-24**

**SUB.CODE & Name: 22MBA25/ STRATEGIC MANAGEMENT**

**Year/Sem/Section: 1<sup>st</sup> Year/ 2<sup>nd</sup> Sem/ B-Section:**

**COURSE OBJECTIVES** This course will enable the students to  
 CLO1: To provide insights into the core concepts of strategic management.  
 CLO2: To evaluate various business strategies in dynamic market environments.  
 CLO3: To gain insights into various strategic management models.

**COURSE OUTCOMES:** At the end of the course the student will be able to :

<b>CO1</b>	Students should get clear idea about the concept of Strategic Management, its relevance, Characteristics, process nature and purpose.
<b>CO2</b>	Student to acquire an understanding of how firms successfully institutionalize a strategy and create an organizational structure for domestic and overseas operations and gain competitive advantage.
<b>CO3</b>	To give the students an insight on strategy at different levels of an organization to gain competitive advantage.
<b>CO4</b>	To help students understand the strategic drive in multinational firms and their decisions in different markets.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedago (as per the syllabi)
	Date	Hr		Date	Hr		
1.	Mon, 15-07-2024	3	Meaning of strategy and strategic management	Mon, 15-07-2024	3	T1, R2	Smar board ppt
2.	Tue, , 16-07-2024	5	Stages of strategic management	Tue, , 16-07-2024	5	T1, R2	Smar board ppt
3.	Thu,18-07-2024	2	strategic management model	Thu,18-07-2024	2	T1, R2	Smar board



							ppt
4.	Fri, 19-07-2024	5	benefits of strategic management,	Fri, 19-07-2024	5	T1, R2	Smart board , ppt
5.	Mon, 22-07-2024	3	key terms in strategic management Competitive advantage,	Mon, 22-07-2024	3	T1, R2	Smart board , ppt
6.	Tue, , 23-07-2024	5	strategists, vision, mission	Tue, , 23-07-2024	5	T1, R2	Smart board , ppt
7.	Thu,25-07-2024	2	long term objectives, strategies, annual objectives and policies.	Thu,25-07-2024	2	T1, R2	Smart board , ppt
8.	Fri, 26-07-2024	5	The process of performing an external audit	Fri, 26-07-2024	5	T1, R2	Smart board , ppt
9.	Sat, 27-07-2024	3	Nature of an external audit	Sat, 27-07-2024	3	T1, R2	Smart board , ppt
10.	Mon, 29-07-2024	3	key external forces	Mon, 29-07-2024	3	T1, R2	Smart board , ppt
11.	Tue, , 30-07-2024	5	industry analysis	Tue, , 30-07-2024	5	T1, R2	Smart board , ppt
12.	Thu,01-08-2024	2	industry analysis	Thu,01-08-2024	2	T1, R2	Smart board , ppt
13.	Fri, 02-08-2024	5	industry analysis	Fri, 02-08-2024	5	T1, R2	Smart board , ppt
14.	Mon, 05-08-2024	3	competitive forces	Mon, 05-08-2024	3	T1, R2	Smart board , ppt
15.	Tue, , 06-08-2024	2	competitive analysis-porter's five forces model	Tue, , 06-08-2024	2	T1, R2	Smart board , ppt
16.	Thu,08-08-2024	2	key success factors	Thu,08-08-2024	2	T1, R2	Smart board , ppt
17.	Fri, 09-08-2024	5	Nature of internal audit	Fri, 09-08-2024	5	T1, R2	Smart board , ppt
18.	Sat, 10-08-2024	3	key internal forces	Sat, 10-08-2024	3	T1, R2	Smart board , ppt
19.	Mon, 12-08-2024	3	process of performing internal audit	Mon, 12-08-2024	3	T1, R2	Smart board , ppt
20.	Tue, , 13-08-2024	5	Resource Based View(RBV)	Tue, , 13-	5	T1, R2	Smart



				08-2024			board , ppt
21	Fri,16-08-2024	5	Integrating strategy and culture	Fri,16-08-2024	5	T1, R2	Smart board , ppt
22	Mon, 19-08-2024	3	SWOT analysis	Mon, 19-08-2024	3	T1, R2	Smart board , ppt
23	Fri, , 23-08-2024	2	Value chain analysis	Fri, , 23-08-2024	2	T1, R2	Smart board , ppt
24	Sat,24-08-2024	3	Bench marking	Sat,24-08-2024	3	T1, R2	Smart board , ppt
25	Mon, 26-08-2024	3	Internal factor evaluation matrix	Mon, 26-08-2024	3	T1, R2	Smart board , ppt
26	Tue, , 27-08-2024	5	The business vision and mission	Tue, , 27-08-2024	5	T1, R2	Smart board , ppt
27	Thu,08-29-2024	2	process of developing vision and mission	Thu,08-29-2024	2	T1, R2	Smart board , ppt
28	Fri, 30-08-2024	5	importance of vision and mission statement	Fri, 30-08-2024	5	T1, R2	Smart board , ppt
29	Sat, 31-08-2024	3	characteristics of mission statement	Sat, 31-08-2024	3	T1, R2	Smart board , ppt
30	Mon, 02-09-2024	3	long term objectives	Mon, 02-09-2024	3	T1, R2	Smart board , ppt
31	Tue, , 03-09-2024	5	types of strategies, levels of strategies	Tue, , 03-09-2024	5	T1, R2	Smart board , ppt
32	Thu,05-09-2024	2	integration strategies, intensive strategies	Thu,05-09-2024	2	T1, R2	Smart board , ppt
33	Fri, 06-09-2024	5	diversification strategies, defensive strategies	Fri, 06-09-2024	5	T1, R2	Smart board , ppt
34	Mon, 09-09-2024	3	Porters generic strategies, Blue Ocean Strategy	Mon, 09-09-2024	3	T1, R2	Smart board , ppt
35	Tue, , 10-09-2024	5	Nature of strategy implementation	Tue, , 10-09-2024	5	T1, R2	Smart board , ppt
36	Thu,12-09-2024	2	annual objectives	Thu,12-09-2024	2	T1, R2	Smart board , ppt

37	Fri, 13-09-2024	5	policies,	Fri, 13-09-2024	5	T1, R2	Smart board , ppt
38	Mon, 14-09-2024	3	resource allocation	Mon, 14-09-2024	3	T1, R2	Smart board , ppt
39	Fri, 20-09-2024	5	managing conflicts	Fri, 20-09-2024	5	T1, R2	Smart board , ppt
40	Mon, 23-09-2024	3	restructuring, reengineering and e-engineering	Mon, 23-09-2024	3	T1, R2	Smart board , ppt
41	Tue, , 24-09-2024	5	linking performance and pay to strategies	Tue, , 24-09-2024	5	T1, R2	Smart board , ppt
42	Thu,26-09-2024	2	creating a strategy-supportive culture	Thu,26-09-2024	2	T1, R2	Smart board , ppt
43	Fri, 27-09-2024	5	operations concerns in implementing strategies	Fri, 27-09-2024	5	T1, R2	Smart board , ppt
44	Sat, 28-09-2024	3	The process of evaluating strategies	Sat, 28-09-2024	3	T1, R2	Smart board , ppt
45	Mon, 30-09-2024	3	strategy evaluation framework	Mon, 30-09-2024	3	T1, R2	Smart board , ppt
46	Tue, , 01-10-2024	5	strategy evaluation framework	Tue, , 01-10-2024	5	T1, R2	Smart board , ppt
47	Thu,03-10-2024	2	balanced score card	Thu,03-10-2024	2	T1, R2	Smart board , ppt
48	Fri, 04-10-2024	5	characteristics of an effective evaluation system	Fri, 04-10-2024	5	T1, R2	Smart board , ppt
49	Mon, 07-10-2024	3	contingency planning	Mon, 07-10-2024	3	T1, R2	Smart board , ppt
50	Tue, , 08-10-2024	5	CASE STUDY	Tue, , 08-10-2024	5	T1, R2	Smart board , ppt
51	Thu,10-10-2024	2	CASE STUDY	Thu,10-10-2024	2		Class Room Discussion
52	Mon, 14-10-2024	3	CASE STUDY	Mon, 14-10-2024	3		Class Room Discussion
53	Tue, , 19-10-2024	5	CASE STUDY	Tue, , 19-10-2024	5		Class Room Discussion

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
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- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
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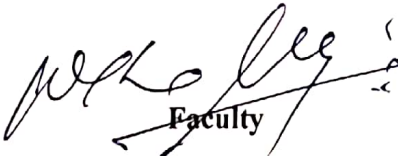
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list: Assignment	30-08-2024
2	CCE-2 from the above list	10,14,19-Oct-2024


### Text Books:

1. Strategic Management Fred R. David Prentice Hall India Publication.

### Reference Book:

1. Crafting and Executing Strategy: The Quest for Competitive Advantage – Concepts and Cases  
Arthur A. Thompson Jr. Margaret A. Peteraf John E. Gamble, A. J. Strickland III, Arun K. Jain, McGraw Hill Education, 16/e 2016
2. Contemporary Strategy Analysis, Robert M. Grant, Wiley India, 10e

  
Faculty

  
HOD, Dept. of Business Administration  
The O. J. S. College of Engineering  
Bommasandra, Hosur Road  
Bangalore 560 068





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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### Name of the Department

### LESSON PLAN

**Faculty Name: Dr. K THARAKA RAMI REDDY**

**Academic Year: 2023-24**

**SUB.CODE & Name: 22MBAHR303/ Recruitment & Selection**

**Year/Sem/Section: 2<sup>nd</sup> / 3<sup>rd</sup>**

**COURSE OBJECTIVES** This course will enable the students to

**CLO1:** To recite the theories and various steps involved in Recruitment and Selection

**CLO2:** To describe and explain in her/his own words, the relevance and importance of Recruitment and Selection in the Organization

**CLO3:** To apply and solve the workplace problems through Recruitment and Selection intervention

**CLO4:** To classify and categorize in differentiating between the best method to be adopted by organization related to Recruitment and Selection

**CLO5:** To compare and contrast different approaches of Recruitment and Selection framework for solving the complex issues and problem

**CLO6:** To design and develop an original framework and framework in dealing with the problems in the organization

### **COURSE OUTCOMES:**

<b>CO1</b>	Gain the practical insight of various principles and practices of recruitment and selection
<b>CO2</b>	Acquire knowledge of latest conceptual framework used in recruitment and selection process and procedure applied in various industries
<b>CO3</b>	. Illustrate the application of recruitment and selection tools and techniques in various sectors.
<b>CO4</b>	Develop a greater understanding about strategies for workforce planning and assessment, analyse the hiring management system followed in various industries.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	Fri, Dec 1, 2023	4	<b>Workforce Planning and Recruitment Analytics: Concept of Work,</b>	Fri, Dec 1, 2023	4	T1, R2	Smart board , ppt
2.	Mon, Dec 4, 2023	5	<b>Organisation's Work and Jobs; Millennials at the work place; Key</b>	Mon, Dec 4, 2023	5	T1, R2	Smart board , ppt



			Characteristicsof Millennials;				
3.	Tue, Dec 5, 2023	3	Types of Millennial; The Evolution of Work Structure; Organising the Work;	Tue, Dec 5, 2023	3	T1, R2	Smart board , ppt
4.	Wed, Dec6, 2023	2	Strategic Job Redesign and Its Benefits; Strategic Issues in Recruitment; What make Bad Recruitment;	Wed, Dec6, 2023	2	T1, R2	Smart board , ppt
5.	Thu, Dec 7, 2023	6	Overview of the Hiring Process; Recruitment Metrics; Factors Affecting Recruitment;	Thu, Dec 7, 2023	6	T1, R2	Smart board , ppt
6.	Fri, Dec 8, 2023	4	Recruitment Strategy: An Internal Approach	Fri, Dec 8, 2023	4	T1, R2	Smart board , ppt
7.	sat , Dec 9, 2023	5	Recruitment Strategy: An External Approach;.	sat , Dec 9, 2023	5	T1, R2	Smart board , ppt
8.	Mon, Dec11, 2023	5	Legal and Ethical Considerations; Organisational Best Practices	Mon, Dec11, 2023	5	T1, R2	Smart board , ppt
9.	Tue, Dec 12, 2023	3	<b>Job Analysis, Job Description and Job Design:</b> Identify the Job to Examine; Determine Appropriate Information Sources and Collect Job-Related Data;	Tue, Dec 12, 2023	3	T1, R2	Smart board , ppt
10	Wed, Dec13, 2023	2	Job Description; Competency and Competency Ice Berg Model;	Wed, Dec13, 2023	2	T1, R2	Smart board , ppt
11	Thu, Dec 14, 2023	6	Why Competency Based Recruitment;	Thu, Dec 14, 2023	6	T1, R2	Smart board , ppt
12	Fri, Dec 15, 2023	4	Sources of Recruitment	Fri, Dec 15, 2023	4	T1, R2	Smart board , ppt
13	Mon, Dec 18, 2023	5	Different steps of job search;	Mon, Dec 18, 2023	5	T1, R2	Smart board , ppt
14	Tue, Dec 19, 2023	3	Motivational Job Specification;	Tue, Dec 19, 2023	3	T1, R2	Smart board , ppt
15	Wed, Dec20, 2023	2	Creation of Functional Specification;	Wed, Dec20, 2023	2	T1, R2	Smart board , ppt
16	Thu, Dec 21, 2023	6	Creation of Behavioural Specification;	Thu, Dec 21, 2023	6	T1, R2	Smart board , ppt
17	Fri, Dec 22, 2023	4	Employer branding;	Fri, Dec 22, 2023	4	T1, R2	Smart board , ppt
18	sat , Dec 23, 2023	3	Social Media; Job Design.	sat , Dec 23, 2023	3	T1, R2	Smart board , ppt
19	Tue, Dec 26, 2023	3	Job Evaluation: The Job Evaluation Process;	Tue, Dec 26, 2023	3	T1, R2	Smart board , ppt
20	Wed, Dec27, 2023	2	Obtain Job KSAOs, Qualifications, Working Conditions, and Essential Duties;	Wed, Dec27, 2023	2	T1, R2	Smart board , ppt
21	Thu, Dec 28,	6	Examine Compensable Factors Using	Thu, Dec	6	T1, R2	Smart



	2023		the Rating/Weighting Evaluation Method;	28, 2023			board , ppt
22	Fri, Dec 29, 2023	4	Determine Overall Job Value;	Fri, Dec 29, 2023	4	T1, R2	Smart board , ppt
23	Sat, Dec 30, 2023	2	Hay Group—Pioneer in Job Evaluation;.	Sat, Dec 30, 2023	2	T1, R2	Smart board , ppt
24	Mon, Jan 1, 2024	5	Determining Compensation using Job Evaluation Data;	Mon, Jan 1, 2024	5	T1, R2	Smart board , ppt
25	Tue, Jan 2, 2024	3	Legal and Ethical Considerations for Job Evaluation;	Tue, Jan 2, 2024	3	T1, R2	Smart board , ppt
26	Wed, Jan3, 2024	2	Online Salary Survey	Wed, Jan3, 2024	2	T1, R2	Smart board , ppt
27	Thu, Jan 4, 2024	6	Case study	Thu, Jan 4, 2024	6	T1, R2	Smart board , ppt
28	Fri, Jan 5 , 2024	4	Case study	Fri, Jan 5 , 2024	4	T1, R2	Smart , board , ppt
29	Thu, Jan 11, 2024	6	Case study	Thu, Jan 11, 2024	6	T1, R2	Smart board , ppt
30	Fri, Jan 12, 2024	4	Selection and Interview Strategy: Interview Strategy and Process;	Fri, Jan 12, 2024	4	T1, R2	Smart board , ppt
31	Sat, Jan 13, 2024	6	Millennials shaping the Recruitment landscape in organizations;	Sat, Jan 13, 2024	6	T1, R2	Smart board , ppt
32	Tue, Jan 16, 2024	3	Strategies for R&s Generation Y into the workforce Developing Effective.	Tue, Jan 16, 2024	3	T1, R2	Smart board , ppt
33	Wed, Jan17, 2024	2	Interviewers;	Wed, Jan17, 2024	2	T1, R2	Smart board , ppt
34	Thu, Jan 18, 2024	6	Interviewing Techniques;	Thu, Jan 18, 2024	6	T1, R2	Smart board , ppt
35	Fri, Jan 19 , 2024	4	Legal and Ethical Considerations in the Interview Process;	Fri, Jan 19 , 2024	4	T1, R2	Smart board , ppt
36	Mon, Jan22, 2024	5	The overall BEI Process;	Mon, Jan22, 2024	5	T1, R2	Smart board , ppt
37	Tue, Jan 23, 2024	3	The overall BEI Process	Tue, Jan 23, 2024	3	T1, R2	Smart board , ppt
38	Wed, Jan 24, 2024	2	Assessment Centre's;	Wed, Jan 24, 2024	2	T1, R2	Smart board , ppt
39	Thu, Jan 25, 2024	6	Simulations	Thu, Jan 25, 2024	6	T1, R2	Smart board , ppt
40	Sat, Jan 27, 2024	4	Simulations	Sat, Jan 27, 2024	4	T1, R2	Smart board , ppt
41	Mon, Jan29, 2024	5	Testing and Assessment: Testing in Occupational Selection;	Mon, Jan29, 2024	5	T1, R2	Smart board , ppt
42	Tue, Jan 30, 2024	3	Test related to Assessment of Knowledge, Skills, and Abilities;	Tue, Jan 30, 2024	3	T1, R2	Smart board , ppt
43	Wed, Jan 31, 2024	2	Personality Assessment;	Wed, Jan 31, 2024	2	T1, R2	Smart board , ppt

44	Thu, Feb 1, 2024	6	The Birkman method and MBTI® comparison	Thu, Feb 1, 2024	6	T1, R2	Smart board , ppt
45	Fri, Feb 2, 2024	4	The Birkman method and MBTI® comparison	Fri, Feb 2, 2024	4	T1, R2	Smart board , ppt
46	Mon, Feb 5, 2024	5	FIRO-B	Mon, Feb 5, 2024	5	T1, R2	Smart board , ppt
47	Tue, Feb 6, 2024	3	Honesty and Integrity Assessment;	Tue, Feb 6, 2024	3	T1, R2	Smart board , ppt
48	Wed, Feb 7, 2024	2	Various Non-Interviewing Methods;	Wed, Feb 7, 2024	2	T1, R2	Smart board , ppt
49	Mon, Feb12, 2024	5	Graphology; Skills Assessment; Games and Group Activity for Leadership Assessment;	Mon, Feb12, 2024	5	T1, R2	Smart board , ppt
50	Tue, Feb 13, 2024	3	Administration of Tests and Assessments;	Tue, Feb 13, 2024	3	T1, R2	Smart board , ppt
51	Wed, Feb14 , 2024	2	Key Interviewer Skills.	Wed, Feb14 , 2024	2	T1, R2	Smart board , ppt
52	Thu, Feb 15, 2024	6	Making the Hire;	Thu, Feb 15, 2024	6	T1, R2	Smart board , ppt
53	Fri, Feb 16, 2024	4	Assessment of Candidate and Job Fit:	Fri, Feb 16, 2024	4	T1, R2	Smart board , ppt
54	Mon, Feb19, 2024	5	Unique Recruitment strategies;	Mon, Feb19, 2024	5	T1, R2	Smart board , ppt
55	Tue, Feb 20, 2024	3	Biodata and Application Forms	Tue, Feb 20, 2024	3	T1, R2	Smart board , ppt
56	Wed, Feb21 , 2024	2	Implications of Using Social Media Content in Hiring decisions	Wed, Feb21 , 2024	2	T1, R2	Smart board , ppt
57	Thu, Feb 22, 2024	6	Background Checks; Reference Checks	Thu, Feb 22, 2024	6	T1, R2	Smart board , ppt
58	Fri, Feb 23, 2024	4	Pre-employment Testing;	Fri, Feb 23, 2024	4	T1, R2	Smart board , ppt
59	Sat, Feb 24, 2024	5	Making a Job Offer;	Sat, Feb 24, 2024	5	T1, R2	Smart board , ppt
60	Mon, Feb26, 2024	5	Transitioning from Job Candidate to Employee;	Mon, Feb26, 2024	5	T1, R2	Smart board , ppt
61	Tue, Feb 27, 2024	3	Induction;	Tue, Feb 27, 2024	3	T1, R2	Smart board , ppt
62	Wed, Feb28 , 2024	2	Placement.	Wed, Feb28 , 2024	2	T1, R2	Smart board , ppt
63	Thu, Feb 29, 2024	6	Case Study	Thu, Feb 29, 2024	6	T1, R2	Smart board , ppt
64	Fri March 1, 2024	4	Case Study	Fri March 1, 2024	4	T1, R2	Smart board , ppt

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

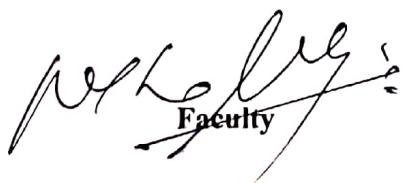
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list: Assignment-1	29/02/2023
2	CCE-2 from the above list: Class Presentations:	January, 29,30 & 31. 2024

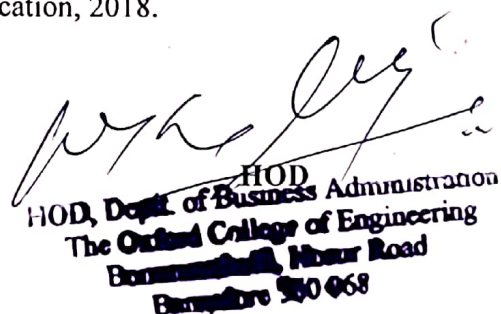
### Text Books:

- 1 How to Recruit, Incentives and Retain Millennials., Rohtak, Sage Publications, 2019.
2. Recruitment and Selection- Strategies for Workforce Planning & Assessment, Carrie A. Picardi, Sage Publication, 2019.

### Reference Book:

1. Human Resource Management, R. C. Sharma, Sage Publication, 2019.
2. Human Resource Management, Amitabha Sengupta, Sage Publication, 2018.

  
Faculty

  
HOD  
HOD, Dept. of Business Administration  
The Oxford College of Engineering  
Bommasandra, Hosur Road  
Bangalore 560 068







**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

Q: 080-61754501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

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Q: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Name of the Department: MBA**

### **LESSON PLAN**

**Faculty Name: DR. K THARAKA RAMI REDDY**

**Academic Year: 2023-24**

**SUB.CODE & Name: 22MBAMM403/ STRATEGIC BRAND MANAGEMENT**

**Year/Sem/Section: 2<sup>nd</sup> Year/ 4<sup>th</sup> Sem/ B-Section:**

**COURSE OBJECTIVES** This course will enable the students to  
**CLO1:** To appreciate the relationship between corporate strategy and Brand Management.  
**CLO2:** To explore the various issues related to Brand Management, brand association, brand identity, brand architecture, leveraging brand assets, brand portfolio management.  
**CLO3:** To develop familiarity and competence with the strategies and tactics involved in building, leveraging and defending strong brands in different sectors.

**COURSE OUTCOMES:** At the end of the course the student will be able to :

<b>CO1</b>	Comprehend & correlate all the management functions to brand creation
<b>CO2</b>	Ability to develop the branding strategies
<b>CO3</b>	Demonstrate their acumen in applying managerial and behavioural concepts in creating brand equity
<b>CO4</b>	Ability to analyse the global brands and their SWOT.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	Tue, 11-06-2024	1	<b>Introduction:</b> Meaning of Brand, Concepts	Tue, 11-06-2024	1	T1, R2	Smart board , ppt
2.	Wed, 12-06-2024	4	Evolution of Brands, Functions of Brand to consumer, Role of Brand-Advantages of Brand	Wed, 12-06-2024	4	T1, R2	Smart board , ppt
3.	Thu, 13-06-	5	Product Vs Brand	Thu, 13-	5	T1, R2	Smart



	2024			06-2024			board , ppt
4.	Fri, 14-06-2024	1	<b>Branding-</b> Meaning, Creation of Brands through goods, services, people, Organization, Retail stores, places, online, entertainment, ideas,	Fri, 14-06-2024	1	T1, R2	Smart board , ppt
5.	Tue, 18-06-2024	1	<b>Branding-</b> Meaning, Creation of Brands through goods, services, people, Organization, Retail stores, places, online, entertainment, ideas,	Tue, 18-06-2024	1	T1, R2	Smart board , ppt
6.	Wed, 19-06-2024	4	challenges to Brand builders. <b>Brand Management-</b> Meaning & Definition.	Wed, 19-06-2024	4	T1, R2	Smart board , ppt
7.	Thu, 20-06-2024	5	Strategic Brand Management Process-Meaning, Steps in Brand Management Process, Strong Indian Brands	Thu, 20-06-2024	5	T1, R2	Smart board , ppt
8.	Fri, 21-06-2024	1	<b>Meaning, Model of CBBE:</b> Brand Equity: Meaning, Sources	Fri, 21-06-2024	1	T1, R2	Smart board , ppt
9.	Sat 22-06-2024	4	Steps in Building Brands, Brand building blocks Resonance, Judgments, Feelings, performance, imagery, salience	Sat 22-06-2024	4	T1, R2	Smart board , ppt
10	Tue, 25-06-2024	1	Steps in Building Brands, Brand building blocks Resonance, Judgments, Feelings, performance, imagery, salience	Tue, 25-06-2024	1	T1, R2	Smart board , ppt
11	Wed, 26-06-2024	4	Brand Building David Aaker's Brand Equity Model Implications	Wed, 26-06-2024	4	T1, R2	Smart board , ppt
12	Thu, 27-06-2024	5	Brand Identity & Positioning: Meaning of Brand identity, Need for Identity &	Thu, 27-06-2024	5	T1, R2	Smart board , ppt
13	Fri, 28-06-2024	1	Positioning, Dimensions of brand identity, Brand identity prism.	Fri, 28-06-2024	1	T1, R2	Smart board , ppt
14	Sat 29-v-2024	4	Brand positioning: Meaning, Point of parity & Point of difference,	Sat 29-v-2024	4	T1, R2	Smart board , ppt
15	Tue, 02-07-2024	1	positioning guidelines, Brand Value: Definition, Core Brand values, Brand mantras, Internal branding.	Tue, 02-07-2024	1	T1, R2	Smart board , ppt
16	Wed, 03-07-2024	4	<b>Meaning of Brand Knowledge:</b> Dimensions of Brand Knowledge	Wed, 03-07-2024	4	T1, R2	Smart board , ppt



17	Thu, 04-07-2024	5	Dimensions of Brand Knowledge.	Thu, 04-07-2024	5	T1, R2	Smart board , ppt
18	Fri, 05-07-2024	1	Meaning of Leveraging Secondary Brand Knowledge	Fri, 05-07-2024	1	T1, R2	Smart board , ppt
19	Tue, 09-07-2024	1	Conceptualizing the leverage process	Tue, 09-07-2024	1	T1, R2	Smart board , ppt
20	Wed, 10-07-2024	4	Criteria for choosing brand elements,.	Wed, 10-07-2024	4	T1, R2	Smart board , ppt
21	Thu, 11-07-2024	5	options & tactics for brand elements-Brand name, Naming guidelines, Naming procedure, Awareness,	Thu, 11-07-2024	5	T1, R2	Smart board , ppt
22	Fri, 12-07-2024	1	options & tactics for brand elements-Brand name, Naming guidelines, Naming procedure, Awareness	Fri, 12-07-2024	1	T1, R2	Smart board , ppt
23	Sat,13-07-2024	4	Brand Associations, Logos & Symbols & their benefits, Characters & Benefits, Slogans & Benefits, Packaging. Leveraging Brand Knowledge	Sat,13-07-2024	4	T1, R2	Smart board , ppt
24	Tue, 23-07-2024	1	Brand hierarchy, Branding strategy	Tue, 23-07-2024	1	T1, R2	Smart board , ppt
25	Wed, 24-07-2024	4	Brand extension and brand transfer,	Wed, 24-07-2024	4	T1, R2	Smart board , ppt
26	Thu, 25-07-2024	5	Managing Brands overtime. Brand Architecture and brand consolidation.	Thu, 25-07-2024	5	T1, R2	Smart board , ppt
27	Fri, 26-07-2024	1	Brand Imitations: Meaning of Brand Imitation, Kinds of imitation.	Fri, 26-07-2024	1	T1, R2	Smart board , ppt
28	Sat,27-07-2024	4	Factors affecting Brand Imitation, Imitation Vs Later market entry,	Sat,27-07-2024	4	T1, R2	Smart board , ppt
29	Tue, 30-07-2024	1	First movers advantages, Free rider effects,.	Tue, 30-07-2024	1	T1, R2	Smart board , ppt
30	Wed, 31-07-2024	4	Benefits for later entrants, Imitation Strategies	Wed, 31-07-2024	4	T1, R2	Smart board , ppt
31	Thu, 01-08-2024	5	Establishing brand Equity Management Systems. Methods for measuring Brand Equity-Quantitative Techniques	Thu, 01-08-2024	5	T1, R2	Smart board , ppt
32	Fri, 02-07-2024	1	Establishing brand Equity Management Systems. Methods for measuring Brand Equity-Quantitative Techniques	Fri, 02-07-2024	1	T1, R2	Smart board , ppt

33	Tue, 06-08-2024	1	Quantitative Techniques	Tue, 06-08-2024	1	T1, R2	Smart board , ppt
34	Wed, 07-08-2024	4	Making Brands go Global: Geographic extension	Wed, 07-08-2024	4	T1, R2	Smart board , ppt
35	Thu, 08-08-2024	5	sources of opportunities for global brand, single name to global brand, consumers & globalization	Thu, 08-08-2024	5	T1, R2	Smart board , ppt
36	Fri, 09-08-2024	1	conditions favoring marketing barriers to globalization	Fri, 09-08-2024	1	T1, R2	Smart board , ppt
37	Sat, 10-08-2024	4	managerial blockages	Sat, 10-08-2024	4	T1, R2	Smart board , ppt
38	Tue, 13-08-2024	1	<b>Global branding:</b> Organization for a global brand	Tue, 13-08-2024	1	T1, R2	Smart board , ppt
39	Wed, 14-08-2024	4	pathways to globalization	Wed, 14-08-2024	4	T1, R2	Smart board , ppt
40	Fri, 16-08-2024	1	Luxury Brand Management: Luxury definition and relativity, luxury goods and luxury brands	Fri, 16-08-2024	1	T1, R2	Smart board , ppt
41	Thu, 22-08-2024	5	basic psychological phenomena associated with luxury purchase	Thu, 22-08-2024	5	T1, R2	Smart board , ppt
42	Fri, 23-08-2024	1	, luxury marketing mix	Fri, 23-08-2024	1	T1, R2	Smart board , ppt
43	Tue, 27-08-2024	1	luxury retail	Tue, 27-08-2024	1	T1, R2	Smart board , ppt
44	Wed, 28-08-2024	4	international luxury markets	Wed, 28-08-2024	4	T1, R2	Smart board , ppt
45	Thu, 29-08-2024	5	historical leaders and emerging countries.	Thu, 29-08-2024	5	T1, R2	Smart board , ppt
46	Fri, 30-08-2024	1	Case Study	Fri, 30-08-2024	1	T1, R2	Smart board , ppt
47	Tue, 03-09-2024	1	Case Study	Tue, 03-09-2024	1	T1, R2	Smart board , ppt
48	Wed, 04-09-2024	4	Case Study	Wed, 04-09-2024	4	T1, R2	Smart board , ppt
49	Thu, 05-09-2024	5	Case Study	Thu, 05-09-2024	5	T1, R2	Smart board , ppt
50	Fri, 06-09-2024	1	Case Study	Fri, 06-09-2024	1	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

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- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
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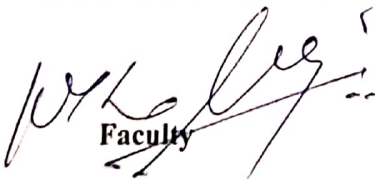
Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list: Assignment	15-07-2024
2	CCE-2 from the above list	10.11.12.13.14-Sept-2024

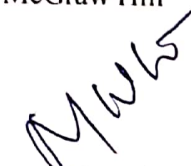
**Text Books:**

1. Strategic Brand Management, Building Measuring & Managing, Kevin Lane Keller, Pearson Education Latest Edition

**Reference Book:**

1. Strategic Brand Management Jean, Noel, Kapferer Kogan Page India, Latest Edition
2. Brand Building and Advertising Concepts and Cases, M B Parameswaran Tata McGraw Hill Publication Latest Edition.

  
Faculty

  
HOD, Dept. of Business Administration  
The Oxford College of Engineering  
Bommasandra, Hosur Road  
Bangalore 560 087





**THE OXFORD COLLEGE OF ENGINEERING**  
**HOSUR ROAD, BOMMANAHALLI, BANGALORE - 68**  
**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**

Lesson Plan

Date: 12/02/2022

Subject code : 18CS81  
 Subject Title : INTERNET OF THINGS TECHNOLOGY  
 Course / Branch : BE/ ISE  
 Semester : VIII  
 Academic Year : 2022-24  
 Faculty Name : Ms. BAIRAVI S M

Unit	Topic No.	Date	Topic	Books Referred & Pages
I	1	12/2/24	<b>MODULE: I</b> What is IoT, Genesis of IoT	T1:
	2	12/2/24	IoT and Digitization ,IoT Impact	T1:6-23
	3	12/2/24	Convergence of IT and IoT ,IoT Challenges	T1:6-23
	4	16/2/24	IoT Network Architecture and Design	T1:24
	5	16/2/24	Drivers Behind New Network Architectures	T1:44
	6	23/2/24	Comparing IoT Architectures	T1:44
	7	23/2/24	A Simplified IoT Architecture	T1:72
	8	24/3/24	The Core IoT Functional Stack	T1:102
	9	24/3/24	IoT Data Management and Compute Stack.	T1:102
	10	24/3/24	IoT Data Management and Compute Stack.	T1:102
II	11	1/3/24	<b>MODULE: II Smart Objects: The "Things" in IoT</b>	T1:170
	12	1/3/24	Sensors, Actuators	T1:170
	13	1/3/24	Smart Objects	T1:203
	14	1/3/24	Sensor Networks	T1:213
	15	1/3/24	Connecting Smart Objects - Communications Criteria	T1:216
	16	1/3/24	Communications Criteria	T1:220
	17	8/3/24	IoT Access Technologies-IEEE 802.15.4	T1:228
	18	8/3/24	IoT Access Technologies- IEEE 802.15.4g & IEEE 802.15.4e	T1:231
	19	9/3/24	IoT Access Technologies IEEE 1901.2a & IEEE 802.11ah	T1:235
	20	9/3/24	IoT Access Technologies LoRaWAN & NB-IoT other LTE variations	T1:235
III	21	22/3/24	<b>MODULE: III</b> <b>IoT Network Layer – Introduction</b>	T1:242
	22	22/3/24	The Business Case for IP	T1:243
	23	22/3/24	The need for Optimization	T1:243
	24	22/3/24	Optimizing IP for IoT	T1:252
	25	23/3/24	Optimizing IP for IoT	T1:262
	26	23/3/24	Optimizing IP for IoT	T1:308
	27	23/3/24	Profiles and Compliances	T1:310
	28	23/3/24	<b>Application Protocols for IoT: The Transport Layer</b>	T1:313
	29	30/3/24	IoT Application Transport Methods	T1:324
	30	30/3/24	IoT Application Transport Methods	T1:372
IV	31	30/3/24	<b>MODULE: IV: Data and Analytics for IoT</b> An Introduction to Data Analytics for IoT	T1:391
	32	30/3/24	Machine Learning	T1:393
	33	30/3/24	Big Data Analytics Tools and Technology	T1:396
	34	30/3/24	Edge Streaming Analytics	T1:407
	35	30/3/24	Network Analytics	T1:418
	36	5/4/24	<b>Securing IoT: A Brief History of OT Security</b>	T1:422
	37	5/4/24	Common Challenges in OT Security	T1:423
	38	5/4/24	Common Challenges in OT Security	T1:492
	39	1/4/24	How IT and OT Security Practices and Systems Vary	T1:499
	40	6/4/24	Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment	T1:510
	41	6/4/24	<b>MODULE: V IoT Physical Devices and Endpoints –</b> Arduino UNO: Introduction to Arduino, Arduino UNO,	T1:514
	42	6/4/24	Installing the Software, Fundamentals of Arduino Programming.	T1:515
	43	12/4/24	IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi,	T1:516
	44	12/4/24	About the RaspberryPi Board: Hardware Layout,	T1:526
	45	13/4/24	Operating Systems on RaspberryPi, Configuring RaspberryPi,	T1:745



V	46	13/4/24	Programming RaspberryPi with Python	T1:745
	47	13/4/24	Wireless Temperature Monitoring System Using Pi. DS18B20 Temperature Sensor	T1:700
	48	19/4/24	Connecting Raspberry Pi via SSH, Accessing Temperature from DS18B20 sensors Remote access to RaspberryPi	T1:700
	49	26/4/24	Smart and Connected Cities, An IoT Strategy for Smarter Cities, Smart City IoT Architecture.	T1:708
	50	27/4/24	Smart City Security Architecture, Smart City Use-Case Examples.	T1:756
	51	3/5/24	Revision -1	
	52	9/5/24	Revision -2	

**TEXT BOOKS:**

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry, "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", 1st Edition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)

2. Srinivasa K G, "Internet of Things", CENGAGE Learning India, 2017


**REFERENCE BOOKS:**

1. Vijay Madiseti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014. (ISBN: 978-8173719547)

2. Raj Kamal, "Internet of Things: Architecture and Design Principles", 1st Edition, McGraw Hill Education, 2017. (ISBN: 978-9352605224)



Faculty



HOD





**CHILDREN'S EDUCATION SOCIETY (REGD.)**  
Administrative Office:  
1st Phase JP Nagar, Bengaluru – 560 078  
☎: 080-3041 0501 – 502 Fax: 080-2654 8658

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UGC Under Section 2(f), Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -30219601/602, Fax: 080 – 25730551/ 30219629 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxford.edu](http://www.theoxford.edu)

### Lesson Plan

Date:19.09.2023

Name :C A BINDYASHREE  
Subject code :18CS744  
Subject Title : CRYPTOGRAPHY  
Course / Branch :B.E/ CSE  
Semester :VII – A sec

**Objective of Course:** Students should be able to:

- Define cryptography and its principles.
- Explain Cryptography algorithms.
- Illustrate Public and Private key cryptography.
- Explain Key management, distribution and certification.
- Explain authentication protocols.
- Tell about IPSec.

**PREREQUISITES:**A basic knowledge of Security, encryption and decryption.

Unit	Date	Topic No.	Topic	Books Referred & Pages
I	20/9/23	1.	Classical Encryption Techniques	T1: 28 - 30
	22/9/23	2.	Symmetric Cipher Model, Cryptography, Cryptanalysis and Brute-Force Attack,	T1: 30 - 34
	23/9/23	3.	Substitution Techniques, Caesar Cipher	T1:35 - 40
	25/9/23	4.	Monoalphabetic Cipher, Playfair Cipher, Hill Cipher, Polyalphabetic Cipher, One Time Pad.	T1:40 - 49
	26/9/23	5.	Block Ciphers and the data encryption standard: Traditional block Cipher structure, stream	T1: 62 - 64
	27/9/23	5.	Ciphers and block Ciphers, Motivation for the feistel Cipher	T1: 65 - 71

			structure, the feistel Cipher,	
	29/9/23	6.	The data encryption standard, DES encryption, DES decryption, A DES example, results, the avalanche effect	T1: 72-75
	3/9/23	7	The strength of DES, the use of 56-Bit Keys, the nature of the DES algorithm, timing attacks	T1: 82 - 85
	4/9/23	8	Block cipher design principles, number of rounds	T1:86 - 87
	6/10/23	9	Design of function F	T1:87–88
	9/10/23	10.	Key schedule algorithm.	T1:89 - 90
II	10/10/23		<b>Public-Key Cryptography and RSA:</b>	
		11.	Principles of public-key cryptosystems. Public-key cryptosystems.	T1: 257 - 259
	11/10/23	12.	Applications for public-key cryptosystems, requirements for public-key cryptosystems.	T1: 260 – 264
	13/10/23	13	Public-key cryptanalysis. The RSA algorithm, description of the algorithm,	T1:268 – 273
	14/10/23	14	Computational aspects, the security of RSA.	T1:274 - 280
	20/10/23	15.	Other Public-Key Cryptosystems: Diffie-Hellman key exchange,	T1: 289 – 290
	25/10/23	16	The algorithm	T1:298
	27/10/23	17.	Key exchange protocols,	T1: 299
	28/10/23	18.	Man in the middle attack,	T1: 300
	30/10/23	19	Elgamal Cryptographic system	T1: 300
	30/10/23	20.	Elgamal Cryptographic system	T1: 300
III	3/11/23		<b>Key Management- Introduction</b>	
		21.	Elliptic curve arithmetic, abelian groups,	T1:301- 303
	6/11/23	22.	Elliptic curves over real numbers, elliptic curves over $Z_p$ , elliptic curves over $GF(2^m)$ ,	T1:304 -309
	7/11/23	23.	Elliptic curve cryptography, Analog of Diffie-Hellman key exchange, Elliptic curve encryption/ decryption,	T1:310 – 311

	8/11/23	24.	Security of Elliptic curve cryptography, Pseudorandom number generation based on an asymmetric cipher,	T1:312 - 314
	10/11/23	25.	PRNG based on RSA. Key Management and Distribution: Symmetric key distribution using Symmetric encryption,	T1:401- 405
	13/11/23	26.	A key distribution scenario, Hierarchical key control, session key lifetime, a transparent key control scheme,	T1: 406 – 409
	15/11/23	27	Decentralized key control, controlling key usage, Symmetric key distribution using asymmetric encryption,	T1: 410 – 415
	17/11/23	28	Simple secret key distribution, secret key distribution with confidentiality and authentication,	T1: 416 – 419
	24/11/23	29	A hybrid scheme, distribution of public keys, public announcement of public keys,	T1: 420 – 422
	25/11/23	30.	Publicly available directory, public key	T1: 423 - 427
IV	27/11/23		<b>Authentication Applications:</b>	
		31.	X-509 certificates. Certificates, X-509 version 3	T1: 419 - 422
	28/11/23	32.	Public key infrastructure. User Authentication: Remote user Authentication principles	T1: 428 - 429
	29/11/23	33.	Mutual Authentication, one way Authentication, remote user Authentication using Symmetric encryption	T1: 436 – 437
IV	1/12/23	34.	Mutual Authentication, one way Authentication, Kerberos, Motivation, Kerberos version 4, Kerberos version 5	T1: 438 – 440
	4/12/23	35	Remote user Authentication using Asymmetric encryption, Mutual Authentication	T1:441 – 443
	5/12/23	36	One way Authentication. Electronic	T1: 444 – 450

			Mail Security: Pretty good privacy, notation, operational; description, S/MIME	
	6/12/23	37	RFC5322, Multipurpose internet mail extensions, S/MIME functionality	T1: 450 – 457
	8/12/23	38.	S/MIME messages, S/MIME certificate processing, enhanced security services	T1: 458 – 460
	9/12/23	39	Domain keys identified mail, internet mail architecture	T1: 461 – 464
	11/12/23	40	E-Mail threats, DKIM strategy, DKIM functional flow	T1: 621 – 623
	12/12/23	41	IP Security: IP Security overview	T1: 624 - 626
	13/12/23	42	Applications of IPsec, benefits of IPsec	T1: 627 - 630
	15/12/23	<b>43</b>	Routing applications, IPsec documents, IPsec services, transport and tunnel modes	T1: 631 - 632
<b>V</b>	18/12/23	44	IP Security policy, Security associations, Security associations database	<b>T1: 633 – 634</b>
	19/12/23	45	Security policy database, IP traffic processing, Encapsulating Security payload	T1: 635 – 636
	20/12/23	46	ESP format, encryption and authentication algorithms	T1: 637 – 638
	22/12/23	47	Padding, Anti replay service Transport and tunnel modes	T1: 639 – 640
	23/12/23	48	Combining security associations, authentication plus confidentiality	T1: 641 – 642
	26/12/23	49	Basic combinations of security associations	T1: 643
	30/12/23	50	Internet key exchange, key determinations protocol	T1: 644
	1/1/24	50	Header and payload formats, cryptographic suits	T1: 655
	2/1/24	51	Revision -Module 1,2&3	

	3/1/24	52	Revision -Module 4&5	
	5/1/24	53	Discussion on University QP's	

**Course Outcomes: After studying this course, students will be able to:**

- 1.Explain basic cryptographic algorithms to encrypt and decrypt the data.
2. Use symmetric and asymmetric cryptography algorithms to encrypt and decrypt the information.
3. Describe the mathematics associated with cryptography.
4. Apply concepts of modern algebra in cryptography algorithms.
5. Apply pseudo random sequence in stream cipher algorithms.
6. Explain authentication protocols and Tell about IPsec.

  
**Faculty**

  
**HOD(ISE)**



**CHILDREN'S EDUCATION SOCIETY (REGD.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

**THE OXFORD COLLEGE OF ENGINEERING**

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade & NBA New Delhi and Recognized by UGC Under Section 2(f) Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)**Department of Information Science & Engineering****LESSON PLAN****Faculty Name:S.Visalini****Academic Year:2023-24(Even)****SUB.CODE&Name: SOFTWARE TESTING(21IS63)****Year/Sem/Section:III/VI/B****COURSE OBJECTIVES** This course will enable the students to

CLO1. . Explain different testing techniques.

CLO 2. Differentiate the various testing techniques.

CLO 3. Apply suitable technique for designing of flow graph.

CLO 4. Analyze the problem and derive suitable test cases.

**COURSE OUTCOMES:**

<b>CO1</b>	Explain the significance of software testing and quality assurance in software development
<b>CO2</b>	Apply the concepts of software testing to assess the most appropriate testing method.
<b>CO3</b>	Analyze the importance of testing in software development.
<b>CO4</b>	Evaluate the suitable testing model to derive test cases for any given software
<b>CO5</b>	Develop appropriate document for the software artefact.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Refer ence Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/4/24	2 <sup>nd</sup> /9.55- 10.50AM	Basics of Software Testing: Humans, Errors and Testing	29/4/24	2 <sup>nd</sup> /9.55- 10.50AM	<b>T2:1-8</b> Ch. 1.1	Chalk and talk method/PPT
2.	30/4/24	3 <sup>rd</sup> /11:00- 11:55 AM	Software Quality, Requirements Behavior and Correctness,	30/4/24	3 <sup>rd</sup> /11:00- 11:55 AM	<b>T2:8- 13</b> Ch. 1.2,1.3	Chalk and talk method/PPT
3.	2/5/24	1 <sup>st</sup> /9.00- 9.55AM	Correctness versus Reliability	2/5/24	1 <sup>st</sup> /9.00- 9.55AM	<b>T2:15- 16</b>	Chalk and talk method/PPT

						<b>Ch1.4</b>	
4.	6/5/24	2 <sup>nd</sup> /9.55-10.50AM	Testing and Debugging	6/5/24	2 <sup>nd</sup> /9.55-10.50AM	<b>T2:17-26</b>	Chalk and talk method/PPT
5.	7/5/24	3rd/11:00-11:55 AM	Test Metrics	7/5/24	3rd/11:00-11:55 AM	<b>T2:27-33</b>	Chalk and talk method/PPT
6.	8/5/24	1st/9.00-9.55AM	Testing and Verification, Test-generation Strategies, Static Testing	8/5/24	1st/9.00-9.55AM	<b>T2:36, 39,41-44</b>	Chalk and talk method/PPT
7.	9/5/24	1st/9.00-9.55AM	Test cases, Insights from a Venn diagram	9/5/24	1st/9.00-9.55AM	T1:5-7 R1:42-46	Chalk and talk method/PPT
8.	13/5/24	2 <sup>nd</sup> /9.55-10.50AM	Identifying test cases:i)Functional Testing, Structural Testing,ii)The Functional vs Structural debate, iii)Test-generation Strategies,	13/5/24	2 <sup>nd</sup> /9.55-10.50AM	T1:7-9 T3:39-41	Chalk and talk method/PPT
9.	14/5/24	3rd/11:00-11:55 AM	Test Metrics, Error and fault taxonomies ,	14/5/24	3rd/11:00-11:55 AM	T3:27-33 T1:10-12	Chalk and talk method/PPT
10.	15/5/24	1st/9.00-9.55AM	Levels of testing, Testing and Verification, Static Testing.	15/5/24	1st/9.00-9.55AM	T3:41-44	Chalk and talk method/PPT
11.	16/5/24	1st/9.00-9.55AM	<b>Problem Statements:</b> The Triangle problem, the Next Date function Generalized pseudo code,	16/5/24	1st/9.00-9.55AM	T1:15-19	Chalk and talk method/Project based Learning
12.	20/5/24	2 <sup>nd</sup> /9.55-10.50AM	The commission problem, the SATM (Simple Automatic Teller Machine) problem,	20/5/24	2 <sup>nd</sup> /9.55-10.50AM	T1:26-30	Chalk and talk method/PPT
13.	21/5/24	3rd/11:00-11:55 AM	The currency converter, Saturn windshield wiper	21/5/24	3rd/11:00-11:55 AM	T1:30-32	Chalk and talk method/PPT
14.	22/5/24	1st/9.00-9.55AM	<b>Module 2:Functional Testing:</b> Boundary value analysis,	22/5/24	1st/9.00-9.55AM	T1:75-77	Chalk and talk method/PPT
15.	23/5/24	1st/9.00-9.55AM	Robustness testing, Worst-case testing,	23/5/24	1st/9.00-9.55AM	T1:78-79	Chalk and talk method/PPT
16.	25/5/24	2 <sup>nd</sup> /9.55-10.50AM	Robust Worst testing for triangle problem,	25/5/24	2 <sup>nd</sup> /9.55-10.50AM	T1:81	Chalk and talk method/PPT
17.	27/5/24	2 <sup>nd</sup> /9.55-10.50AM	Next date problem and commission problem,	27/5/24	2 <sup>nd</sup> /9.55-10.50AM	T1:82-85	Chalk and talk method/PPT
18.	28/5/24	3rd/11:00-11:55 AM	<b>Equivalence classes:</b> i) Equivalence test cases for the triangle problem,	28/5/24	3rd/11:00-11:55 AM	T1:89-95 R3:42-49	Chalk and talk method/PPT
19.	29/5/24	1st/9.00-	Next Date function, and the	29/5/24	1st/9.00-	T1:10	Chalk and talk

		<b>9.55AM</b>	commission problem		<b>9.55AM</b>	9-114	method/PPT
20.	30/5/24	<b>1st/9.00-9.55AM</b>	<b>Decision tables:</b> Test cases for the triangle problem, NextDate function, and the commission problem	30/5/24	<b>1st/9.00-9.55AM</b>	T1:10 3-108 R3:36-38	Chalk and talk method/PPT
21.	8/6/24	<b>3rd/11:00-11:55 AM</b>	Guidelines and observations.	8/6/24	<b>3rd/11:00-11:55 AM</b>	T1:11 4-115	Chalk and talk method/PPT
22.	10/6/24	<b>2nd/9.55-10.50AM</b>	<b>Module 3:</b> Structural Testing: Overview, Statement testing,	10/6/24	<b>2nd/9.55-10.50AM</b>	T2:21 1-215	Chalk and talk method/PPT
23.	11/6/24	<b>3rd/11:00-11:55 AM</b>	Branch testing, Condition testing	11/6/24	<b>3rd/11:00-11:55 AM</b>	T2:21 7-219	Chalk and talk method/PPT
24.	12/6/24	<b>1st/9.00-9.55AM</b>	Path testing: i)DD paths, ii)Test coverage metrics, iii)Metric based testing test coverage analyzers,	12/6/24	<b>1st/9.00-9.55AM</b>	T2:22 2-228	Chalk and talk method/PPT
25.	13/6/24	<b>1st/9.00-9.55AM</b>	Basis path testing: i)McCabe's basis path method ii)Essential complexity, guidelines and observations,	13/6/24	<b>1st/9.00-9.55AM</b>	T1:13 9-147	Chalk and talk method/PPT
26.	18/6/24	<b>3rd/11:00-11:55 AM</b>	Data –Flow testing: Definition-Use testing: i)du-paths for stocks, ii)du-paths for locks, iii)du-paths for total locks, iv)du-paths for sales, v)du-paths for commission, vi)Test coverage metrics.	18/6/24	<b>3rd/11:00-11:55 AM</b>	T2:23 5-236	Chalk and talk method/PPT
27.	19/6/24	<b>1st/9.00-9.55AM</b>	Slice Based Testing: i)Style and technique, ii) Guidelines and observations.	19/6/24	<b>1st/9.00-9.55AM</b>	T1:16 1-167	Chalk and talk method/PPT
28.	20/6/24	<b>1st/9.00-9.55AM</b>	Levels of Testing, Integration Testing: Traditional view of testing levels, Alternative life-cycle models	20/6/24	<b>1st/9.00-9.55AM</b>	T1:18 1-185	Chalk and talk method/PPT
29.	22/6/24	<b>1st/9.00-9.55AM</b>	The SATM system, Separating integration and system testing	22/6/24	<b>1st/9.00-9.55AM</b>	T1:18 6-199	Chalk and talk method/PPT
30.	24/6/24	<b>2nd/9.55-10.50AM</b>	A closer look at the SATM system, Decomposition-based integration: i)Top down Integration, ii) Bottom up Integration iii)Sandwich Integration.	24/6/24	<b>2nd/9.55-10.50AM</b>	T1:20 3-208	Chalk and talk method/PPT

31.	<b>25/6/24</b>	<b>3rd/11:00-11:55 AM</b>	Call graph-based: i)Pair wise Integration and ii)Neighborhood Integration, Path-based integrations: i)New and Extended concepts, ii) MM Paths in the SATM System iii) MM Path Complexity.	<b>25/6/24</b>	<b>3rd/11:00-11:55 AM</b>	T1:20 9-220	Chalk and talk method/PPT
32.	<b>26/6/24</b>	<b>1st/9.00-9.55AM</b>	Levels of Testing: Traditional view of testing levels	<b>26/6/24</b>	<b>1st/9.00-9.55AM</b>	T1:18 1-183	Chalk and talk method/PPT
33.	<b>27/6/24</b>	<b>1st/9.00-9.55AM</b>	Alternative life-cycle models,	<b>27/6/24</b>	<b>1st/9.00-9.55AM</b>	T1:18 3-186	Chalk and talk method/PPT
34.	<b>29/6/24</b>	<b>1st/9.00-9.55AM</b>	The SATM system, Separating integration and system testing.	<b>29/6/24</b>	<b>1st/9.00-9.55AM</b>	T1:18 6-199	Chalk and talk method/PPT
35.	<b>1/7/24</b>	<b>2nd/9.55-10.50AM</b>	The SATM system, Separating integration and system testing.	<b>1/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:18 6-199	Chalk and talk method/PPT
36.	<b>2/7/24</b>	<b>3rd/11:00-11:55 AM</b>	Integration Testing: A closer look at the SATM system	<b>2/7/24</b>	<b>3rd/11:00-11:55 AM</b>	T1:20 1-205	Chalk and talk method/PPT
37.	<b>8/7/24</b>	<b>2nd/9.55-10.50AM</b>	Decomposition-based, call graph-based, Path based integrations.	<b>8/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:20 5-221	Chalk and talk method/PPT
38.	<b>9/7/24</b>	<b>3rd/11:00-11:55 AM</b>	call graph-based	<b>9/7/24</b>	<b>3rd/11:00-11:55 AM</b>	T1:20 9-212	Chalk and talk method/PPT
39.	<b>10/7/24</b>	<b>1st/9.00-9.55AM</b>	Path based integrations	<b>10/7/24</b>	<b>1st/9.00-9.55AM</b>	T1:21 2-221	Chalk and talk method/PPT
40.	<b>11/7/24</b>	<b>1st/9.00-9.55AM</b>	Revision	<b>11/7/24</b>	<b>1st/9.00-9.55AM</b>		Chalk and talk method/PPT
41.	<b>13/7/24</b>	<b>2nd/9.55-10.50AM</b>	Module 5: System Testing: Threads,	<b>13/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:22 9-232	Chalk and talk method/PPT
42.	<b>15/7/24</b>	<b>2nd/9.55-10.50AM</b>	Requirement Specification,	<b>15/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:23 3-236	Chalk and talk method/PPT
43.	<b>15/7/24</b>	<b>2nd/9.55-10.50AM</b>	Finding Threads	<b>15/7/24</b>	<b>2nd/9.55-10.50AM</b>	T1:23 7-240	Chalk and talk method/PPT
44.	<b>16/7/24</b>	<b>3rd/11:00-11:55 AM</b>	Structural strategies for thread testing,	<b>16/7/24</b>	<b>3rd/11:00-11:55 AM</b>	T1:24 0-244	Chalk and talk method/PPT
45.	<b>18/7/24</b>	<b>1st/9.00-9.55AM</b>	SATM test threads	<b>18/7/24</b>	<b>1st/9.00-9.55AM</b>	T1:24 8-252	Chalk and talk method/PPT
46.	<b>18/7/24</b>	<b>1st/9.00-9.55AM</b>	System testing guidelines,	<b>18/7/24</b>	<b>1st/9.00-9.55AM</b>	T1:25 3-256	Chalk and talk method/PPT
47.	<b>22/7/24</b>	<b>2nd/9.55</b>	ASF testing example.	<b>22/7/24</b>	<b>2nd/9.55</b>	T1:25 7-259	Chalk and talk method/PPT
48.	<b>22/7/24</b>	<b>2nd/9.55</b>	Interaction Testing: Context of interaction	<b>22/7/24</b>	<b>2nd/9.55</b>	T1:26 1-263	Chalk and talk method/PPT

49.	23/7/24	3rd/11:00	A taxonomy of interactions, Interaction, composition, and determinism	23/7/24	3rd/11:00	T1:26 3-277	Chalk and talk method/PPT
50.	23/7/24	3rd/11:00	Client/Server Testing	23/7/24	3rd/11:00	T1:28 0-282	Chalk and talk method/PPT

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list(i)	31/5/24
2	CCE-2 from the above list(v)	2/7/24

#### Text Books:

1. Paul C. Jorgensen: Software Testing, A Craftsman"s Approach, 3rd Edition, Auerbach Publications, 2008
2. Aditya P Mathur: Foundations of Software Testing, Pearson Education, 2008.

#### Reference Book:

1. Mauro Pezze, Michal Young: Software Testing and Analysis – Process, Principles and Techniques, Wiley India, 2009.
2. Software testing Principles and Practices – Gopaldaswamy Ramesh, Srinivasan Desikan, 2 nd Edition, Pearson, 2007.
3. Software Testing – Ron Patton, 2nd edition, Pearson Education, 2004.
4. The Craft of Software Testing – Brian Marrick, Pearson Education, 1995.
5. Anirban Basu, Software Quality Assurance, Testing and Metrics, PHI, 2015.

  
Faculty

  
HOD(ISE)





**THE OXFORD COLLEGE OF ENGINEERING**  
**HOSUR ROAD, BOMMANAHALLI, BANGALORE - 68**  
**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**  
**Lesson Plan**

**Date:**

**Subject code** : 17CS53  
**Subject Title** : DATA BASE MANAGEMENT SYSTEMS  
**Course / Branch** : B.E/ Information science and Engineering  
**Semester** : V-A  
**Academic Year** : 2023-24 (Odd Semester)  
**Faculty Name** : Abidha T E

**Course Objective:**

- Provide a strong foundation in database concepts, technology, and practice.
- Practice SQL programming through a variety of database problems.
- Demonstrate the use of concurrency and transactions in database
- Design and build database applications for real world problems.

**Course Outcome:** Students will be able to

- Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
- Design and build GUI application to interact with databases.
- Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
- Master sound design principles for logical design of databases, including the E-R method and normalization approach
- Master the basics of query evaluation techniques and query optimization.
- Be familiar with the basic issues of transaction processing and concurrency control.

**PREREQUISITES:** Knowledge of requirements data, information and management.

Module	Topic No.	Date	Topic	Books Referred & Pages
I	1.	27/11/23	<b>Introduction to Databases:</b> i)Introduction ii)Characteristics of database approach	<b>T1:1.1 - 1.3</b>
	2.	28/11/23	<b>Advantages of using the DBMS approach</b> i)Controlling Redundancy ii)Restricting unauthorized access iii)Backup & Recovery iv) Multiple user interfaces v)Integrity constraints, <b>History of database applications</b> i)Hierarchical & Network systems ii)Relational DB iii)Complex DB	<b>T1:1.6,1.7</b>
	3.	28/11/23	<b>Overview of Database Languages and Architectures:</b> i)Data Models,	<b>T1:2.1</b>
	4.	04/12/23	<b>Schemas and Instances</b> i)Three schema architecture ii) Data independence,	<b>T1:2.2</b>

	5.	05/12/23	<b>Languages and interfaces :</b> i)DBMS Languages ii)DBMS Interfaces <b>The Database System environment</b> i)DBMS component modules ii)DB system utilities iii)Tools & Applications	<b>T1:2.3</b>
	6.	04/12/23	<b>Conceptual Data Modeling using Entities and Relationships:</b> i) Entity types	<b>T1:3.3</b>
	7.	07/12/23	<b>Conceptual Data Modeling using Entities and Relationships:</b> ii)Entity sets iii)Attributes iv) Roles v)structural constraints	<b>T1:3.3,3.4</b>
	8.	09/12/23	<b>Weak entity types</b> i)ER diagrams	<b>T1:3.5,3.6</b>
	9.	11/12/23	<b>Conceptual Data Modeling examples</b> i)Conceptual Design ii)Physical Design iii)Logical design	<b>T1:3.8</b>
	10.	12/12/23	i)Specialization ii) Generalization.	<b>T1:4.2</b>
<b>II</b>	11.	12/12/23	<b>Relational Model: Relational Model Concept</b> i)Domains,Attributes,tuples & Relations ii)Characteristics of Relation iii)Relational Model Notation	<b>T1:5.1</b>
	12.	14/12/23	<b>Relational Model Constraints and relational database schemas</b> i)Domain Constraints ii)Key constraints iii)Relational DB schema iii)Integrity	<b>T1:5.2</b>
	13.	18/12/23	<b>Update operations, transactions, and dealing with constraint violations</b> i)Insert operation ii)Delete operation iii)Update operation iv)Transaction concept	<b>T1:5.3</b>
	14.	19/12/23	<b>Relational Algebra: i)</b> Unary relational operations ii) Binary relational operations.	<b>T1:6.1 - 6.3</b>
	15.	19/12/23	<b>Additional relational operations</b> i)Aggregate function ii)Grouping iii)Recursive closure operation	<b>T1:6.4</b>
	16.	21/12/23	Examples of Queries in relational algebra.	<b>T1:6.5</b>
	17.	23/12/23	<b>Mapping Conceptual Design into a Logical Design: i)</b> Relational Database Design using ER-to-Relational mapping.	<b>T1:7.1</b>
	18.	26/12/23	<b>SQL:i)</b> SQL data definition and data types ii)Specifying constraints in SQL	<b>T1:8.1</b>
	19.	26/12/23	<b>Retrieval queries in SQL</b> i)INSERT ii)DELETE iii) UPDATE statements in SQL.	<b>T1:8.6</b>
	20.	01/01/24	<b>Additional features of SQL.</b> i) Grant & Revoke	<b>T1:8.9</b>
	21.	02/01/24	<b>SQL : Advances Queries: i)</b> More complex SQL retrieval queries ii)The Middle Tier	<b>T1:8.5</b>

III	22.	02/01/24	<b>Specifying constraints as assertions and action triggers</b> i)Assertion ii)Trigger	<b>T1:8.7</b>
	23.	04/01/24	<b>Views in SQL</b> i)Concepts ii)Specification iii)Implementations <b>Schema change statements in SQL.</b>	<b>T1:8.8</b>
	24.	08/01/24	<b>Database Application Development:</b> Accessing databases from applications,	<b>T2:6.1</b>
	25.	09/01/24	An introduction to JDBC, JDBC classes and interfaces,	<b>T2:6.2,6.3</b>
	26.	09/01/24	SQLJ, Stored procedures	<b>T2:6.4,6.5</b>
	27.	11/01/24	Case study: The internet Bookshop.	<b>T2:6.6</b>
	28.	13/01/24	<b>Internet Applications:</b> The three-Tier application architecture	<b>T2:7.5</b>
	29.	16/01/24	The presentation layer	<b>T2:7.6</b>
	30.	16/01/24	The Middle Tier	<b>T2:7.7</b>
IV	31.	18/01/24	<b>Normalization: Database Design Theory</b> i)Introduction to Normalization using Functional and Multivalued Dependencies ii)Informal design guidelines for relation schema	<b>T1:10.1</b>
	32.	22/01/24	<b>Functional Dependencies</b> i)Definition ii)Equivalence of sets iii)Minimal sets	<b>T1:10.2</b>
	33.	23/01/24	<b>Normal Forms based on Primary Keys:</b> i)Normalization of Relations ii)Practical use iii)Keys & Attributes iv)First NF <b>Second and Third Normal Forms:</b> i)Definiton of 2NF ii) Definiton of 3NF	<b>T1:10.3,10.4</b>
	34.	23/01/24	Boyce-Codd Normal Form	<b>T1:10.5</b>
	35.	25/01/24	<b>Multivalued Dependency and Fourth Normal Form:</b> i)Definition of MVD ii)Inference Rules iii)4NF iv)Nonadditive join Decomposition into 4NF	<b>T1:11.3</b>
	36.	01/02/24	Join Dependencies and Fifth Normal Form.	<b>T1:11.4</b>
	37.	05/02/24	<b>Normalization Algorithms:</b> i)Inference Rules ii)Equivalence iii)Minimal Cover	<b>T1:10.2,11.4</b>
	38.	06/02/24	<b>Properties of Relational Decompositions</b> i) Relational Decompositions ii)Dependency Preservation iii)Nonadditive <b>Algorithms for Relational Database Schema Design</b> i)Dependency Preservation ii)Nonadditive Join Decomposition	<b>T1:11.1</b>
	39.	06/02/24	i)Nulls ii)Dangling tuples iii)Alternate Relational Designs	<b>T1:11.2</b>

V	40.	08/02/24	Further discussion of Multivalued dependencies and 4NF <b>Other dependencies and Normal Forms</b> i)Template Dependencies ii)Arithmetic functions iii)Domain Key NF	<b>T1:11.3</b>
	41.	10/02/24	<b>Transaction Processing:</b> i)Introduction to Transaction Processing, ii)Transaction and System concepts	<b>T1:17.1,17.2</b>
	42.	12/02/24	<b>Desirable properties of Transactions</b> i)ACID Properties <b>Characterizing schedules based on recoverability</b> i)Schedules of transaction	<b>T1:17.3,17.4</b>
	43.	13/02/24	<b>Characterizing schedules based on Serializability</b> i)Serial & Nonserial schedule ii)uses <b>Transaction support in SQL</b> i)Dirty read ii)Nonrepeatable Read iii)Phantoms	<b>T1:17.5,17.6</b>
	44.	13/02/24	<b>Concurrency Control in Databases: Two-phase locking techniques for Concurrency control</b> i)types of Locks ii)Guaranteeing serializability	<b>T1:18.1</b>
	45.	15/02/24	<b>Concurrency control based on Timestamp ordering</b> i)Timestamps ii)Timestamp ordering algorithms	<b>T1:18.2</b>
	46.	19/02/24	<b>Multiversion Concurrency control techniques</b> i)Multiversion Technique based on timestamp ii)Multiversion 2phase locking <b>Validation Concurrency control techniques</b> i)Read phase ii)Validation phase iii)Write phase	<b>T1:18.3,18.4</b>
	47.	20/02/24	<b>Granularity of Data items and Multiple Granularity Locking</b> i)Granularity level consideration ii) Multiple Granularity Locking	<b>T1:18.5</b>
	48.	20/02/24	<b>Introduction to Database Recovery Protocols:</b> i)Recovery Concepts, ii)NO-UNDO/REDO recovery based on Deferred update	<b>T2:19.1,19.2</b>
	49.	22/02/24	<b>Recovery techniques based on immediate update</b> i)Undo/Redo recovery <b>Shadow paging</b>	<b>T2:19.3,19.4</b>
50.	24/02/24	Database backup and recovery from catastrophic failures	<b>T2:19.7</b>	
51.	26/02/24	REVISION on MODULE 1 & 2		
52.	27/02/24	REVISION on MODULE 3 & 4		
53.	27/02/24	REVISION on MODULE 5		
54.	29/02/24	VTU Question & Answers Discussion.		

### Self-study Topics (Out –of- Syllabus)

Sl. No.	Self –study Topics	Suggested Reference
1.	Example Database applications	R2 : 1-23
2.	ER to Relational mappings	R1 : 25-34

#### Assignment Topics

Sl. No.	Assignment Topics	Submission due on
1.	Create ER diagram for university database	
2.	Illustrate all the 5 normal forms with a sample database.	
3.	Mini project(Online applications)	

#### Home work Topics

Sl. No.	Homework Topics	Submission due on
1.	E-R diagrams	
2.	Simple and complex SQL queries	
3.	Normal forms	

#### Quiz / Class Test Topics:

Sl. No.	Topics	Submission due on
1.	MODULE 1, MODULE 2	
2.	MODULE 3, MODULE 4	
3.	MODULE 5.	

#### Students Feedback about the course from Last Year:

1. Difficulty in solving SQL queries.

#### Action Plan proposed to accommodate the Feedback:

1. Tutorial classes planned for solving more SQL queries.
2. For weak students more concentration on solving frequently asked questions from VTU Previous year question paper

#### Text Books:

1. Database systems Models, Languages, Design and Application Programming, Ramez Elmasri and Shamkant B. Navathe, 6th Edition, Pearson.
2. Database management systems, Ramakrishnan, and Gehrke, 3rd Edition, 2014, McGraw Hill

#### Reference Books:

1. Silberschatz Korth and Sudharshan: Database System Concepts, 6th Edition, Mc-Graw Hill, 2013.
2. Coronel, Morris, and Rob, Database Principles Fundamentals of Design, Implementation and Management, Cengage Learning 2012.



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**CHILDREN'S EDUCATION SOCIETY (Regd.)**

Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

## **THE OXFORD COLLEGE OF ENGINEERING**

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### **DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**

#### **LESSON PLAN**

**Faculty Name: Indu K S**

**Academic Year: 2023-24 EVEN**

**SUB.CODE & Name: BCS403 DATABASE MANAGEMENT SYSTEM**

**Year/Sem/Section: II/IV/A**

**COURSE OBJECTIVES** This course will enable the students to  
 CLO1.To Provide a strong foundation in database concepts, technology, and practice.  
 CLO2.To Practice SQL programming through a variety of database problems.  
 CLO3.To Understand the relational database design principles.  
 CLO4. To demonstrate the use of concurrency and transactions in database.  
 CLO5. To Design and build database applications for real world problems.  
 CLO6.To become familiar with database storage structures and access techniques.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Describe the basic elements of a relational database management system
<b>CO2</b>	Design entity relationship for the given scenario.
<b>CO3</b>	Apply various Structured Query Language (SQL) statements for database manipulation.
<b>CO4</b>	Analyse various normalization forms for the given application.
<b>CO5</b>	Develop database applications for the given real world problem.
<b>CO6</b>	Understand the concepts related to NoSQL databases.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/04/24	2	Introduction to Databases: Introduction,	22/04/24	2	Textbook 1	Chalk and board
2.	24/04/24	2	Characteristics of database approach	24/04/24	2	Textbook 1	Chalk and board
3.	25/04/24	1	Advantages of using	25/04/24	1	Textbook 1	Chalk and

			the DBMS approach				board
4.	26/04/24	3	History of database applications.	26/04/24	3	Textbook 1	Chalk and board
5.	2/05/24	1	Overview of Database Languages and Architectures: Data Models	2/05/24	1	Textbook 1	Chalk and board
6.	3/05/24	3	Schemas, and Instances	3/05/24	3	Textbook 1	Chalk and board
7.	6/05/24	2	Three schema architecture and data independence, database languages, and interfaces,	6/05/24	2	Textbook 1	Chalk and board
8.	8/05/24	2	The Database System environment.	8/05/24	2	Textbook 1	Chalk and board
9.	9/05/24	1	Conceptual Data Modelling using Entities and Relationships: Entity types, Entity sets and structural constraints,	9/05/24	1	Textbook 1	Chalk and board
10.	13/05/24	2	Weak entity types, ER diagrams, Specialization and Generalization.	13/05/24	2	Textbook 1	Chalk and board
11.	15/05/24	2	Relational Model: Relational Model Concepts	15/05/24	2	Textbook 1	Chalk and board
12.	16/05/24	1	Relational Model Constraints and relational database schemas	16/05/24	1	Textbook 1	Chalk and board
13.	17/05/24	3	Update operations, transactions, and dealing with constraint violations.	17/05/24	3	Textbook 1	Chalk and board
14.	20/05/24	2	Relational Algebra: Unary and Binary relational operations	20/05/24	2	Textbook 1	Chalk and board
15.	22/05/24	2	Additional relational operations (aggregate, grouping, etc.)	22/05/24	2	Textbook 1	Chalk and board
16.	23/05/24	1	Examples of Queries in relational algebra	23/05/24	1	Textbook 1	Chalk and board
17.	27/05/24	2	Mapping Conceptual Design into a Logical Design: Relational Database Design using ER-to-	27/05/24	2	Textbook 1	Chalk and board

			Relational mapping.				
18.	29/05/24	2	Normalization: Database Design Theory – Introduction to Normalization using Functional and Multivalued Dependencies	29/05/24	2	Textbook 1	Chalk and board
19.	30/05/24	1	Informal design guidelines for relation schema	30/05/24	1	Textbook 1	Chalk and board
20.	31/05/24	3	Functional Dependencies	31/05/24	3	Textbook 1	Chalk and board
21.	03/06/24	2	Normal Forms based on Primary Keys	03/06/24	2	Textbook 1	Chalk and board
22.	05/06/24	2	Second and Third Normal Forms	05/06/24	2	Textbook 1	Chalk and board
23.	06/06/24	1	Boyce-Codd Normal Form	06/06/24	1	Textbook 1	Chalk and board
24.	07/06/24	3	Multivalued Dependency and Fourth Normal Form	07/06/24	3	Textbook 1	Chalk and board
25.	13/06/24	1	Join Dependencies and Fifth Normal Form	13/06/24	1	Textbook 1	Chalk and board
26.	14/06/24	3	SQL: SQL data definition and data types	14/06/24	3	Textbook 1	Chalk and board
27.	19/06/24	2	Schema change statements in SQL	19/06/24	2	Textbook 1	Chalk and board
28.	20/06/24	1	specifying constraints in SQL	20/06/24	1	Textbook 1	Chalk and board
29.	21/06/24	3	retrieval queries in SQL	21/06/24	3	Textbook 1	Chalk and board
30.	24/06/24	2	INSERT, DELETE, and UPDATE statements in SQL	24/06/24	2	Textbook 1	Chalk and board
31.	26/06/24	2	Additional features of SQL	26/06/24	2	Textbook 1	Chalk and board
32.	27/06/24	1	SQL: Advanced Queries: More complex SQL retrieval queries	27/06/24	1	Textbook 1	Chalk and board
33.	28/06/24	3	Specifying constraints as assertions and action triggers	28/06/24	3	Textbook 1	Chalk and board
34.	01/07/24	2	Views in SQL	01/07/24	2	Textbook 1	Chalk and board
35.	03/07/24	2	Transaction	03/07/24	2	Textbook 1	Chalk and

			Processing: Introduction to Transaction Processing				board
36.	04/07/24	1	Transaction and System concepts	04/07/24	1	Textbook 1	Chalk and board,PPT
37.	05/07/24	3	Desirable properties of Transactions,	05/07/24	3	Textbook 1	Chalk and board,PPT
38.	08/07/24	2	Characterizing schedules based on recoverability	08/07/24	2	Textbook 1	Chalk and board,PPT
39.	10/07/24	2	Characterizing schedules based on Serializability	10/07/24	2	Textbook 1	Chalk and board,PPT
40.	11/07/24	1	Transaction support in SQL	11/07/24	1	Textbook 1	Chalk and board,PPT
41.	12/07/24	3	Concurrency Control in Databases: Two- phase locking techniques for Concurrency control	12/07/24	3	Textbook 1	Chalk and board,PPT
42.	15/07/24	2	Concurrency control based on Timestamp ordering, Multiversion Concurrency control techniques	15/07/24	2	Textbook 1	Chalk and board,PPT
43.	18/07/24	1	Validation Concurrency control techniques	18/07/24	1	Textbook 1	Chalk and board,PPT
44.	19/07/24	3	Granularity of Data items and Multiple Granularity Locking	19/07/24	3	Textbook 1	Chalk and board,PPT
45.	22/07/24	2	NOSQL Databases and Big Data Storage Systems: Introduction to NOSQL Systems	22/07/24	2	Textbook 1	Chalk and board,PPT
46.	24/07/24	2	The CAP Theorem, Document-Based NOSQL Systems and MongoDB	24/07/24	2	Textbook 1	Chalk and board,PPT
47.	25/07/24	1	NOSQL Key-Value Stores, Column-Based or Wide Column NOSQL Systems	25/07/24	1	Textbook 1	Chalk and board,PPT
48.	26/07/24	3	NOSQL Graph Databases and Neo4j	26/07/24	3	Textbook 1	Chalk and board,PPT
49.	01/08/24	1	REVISION	01/08/24	1		
50.	02/08/24	3	REVISION	02/08/24	3		
51.	05/08/24	2	REVISION	05/08/24	2		



52.	07/08/24	2	REVISION	07/08/24	2		
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### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	<b>08/06/24</b>
2	Quiz	<b>27/07/24</b>

**Text Books:**

1. 1. Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, 7th Edition, 2017, Pearson.

**Reference Book:**

1. Database management systems, Ramakrishnan, and Gehrke, 3rd Edition, 2014, McGraw Hill



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THE OXFORD COLLEGE OF ENGINEERING  
HOSUR ROAD, BOMMANAHALLI, BANGALORE - 68  
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Lesson Plan

Date: 11/06/2023

**Subject code** : BCS306A.  
**Subject Title** : Object Oriented Programming with Java  
**Course / Branch** : B.E/ISE  
**Semester** : III  
**Academic Year** : 2023-24 (Odd)  
**Faculty Name** : KARTHIK S L

**COURSE OUTCOMES:**

1. Demonstrate proficiency in writing simple programs involving branching and looping structures.
- 2 Design a class involving data members and methods for the given scenario
3. Apply the concepts of inheritance and interfaces in solving real world problems.
4. Use the concepts of packages and exception handling in solving complex problems
5. Apply the concepts of Multithreading, auto boxing and enumeration in program development

**PREREQUISITE: Basic Knowledge of C programming language and structures**

<b>Module</b>	<b>Topic No.</b>	<b>Date</b>	<b>Topic</b>	<b>Books Referred &amp; Pages</b>
<b>I</b>	1.	15/10/23	<b>An Overview of Java: Object-Oriented Programming (Two Paradigms, Abstraction, The Three OOP Principles), Using Blocks of Code, Lexical Issues (Whitespace, Identifiers, Literals, Comments, Separators, The Java Keywords).</b>	<b>T1: 15-21</b> R1:150-160
	2.	15/10/23	<b>Data Types, Variables, and Arrays: The Primitive Types (Integers, Floating-Point Types, Characters, Booleans), Variables, Type Conversion and Casting, Automatic Type Promotion in Expressions, Arrays, Introducing Type Inference with Local Variables.</b>	<b>T1: 21-27</b> R1:160-165
	3.	15/10/23	<b>Operators: Arithmetic Operators, Relational Operators, Boolean Logical Operators, The Assignment Operator</b>	<b>T1 : 27-31</b> R1:170-175
	4.	16/10/23	<b>The ? Operator, Operator Precedence, Using Parentheses</b>	<b>T1: 31-32</b> R1:175-180
	5.	22/10/23	<b>Control Statements: Java's Selection Statements (if, The Traditional switch), Iteration Statements</b>	<b>T1 : 33-33</b> R1:180-185

			( <b>while, do-while, for, The For-Each</b> Version of the for Loop	
	6.	22/10/23	<b>Control Statements: Java's Selection</b> Statements (if, <b>The Traditional switch</b> ), Iteration Statements ( <b>while, do-while, for, The For-Each</b> Version of the for Loop-Continue	<b>T1: 33-36</b> R1:190-194
	7.	22/10/23	Local <b>Variable Type Inference in a</b> for Loop, <b>Nested Loops</b> ), Jump Statements ( <b>Using break, Using</b> continue, return).	<b>T1: 36-39</b> R1:195-205
<b>II</b>	8	23/10/23	<b>Introducing Classes: Class Fundamentals</b>	<b>T1:39-45</b> R1:200-205
	9.	29/10/23	<b>Declaring Objects</b>	<b>T1:47-47</b> R1:205-210
	10.	29/10/23	<b>Assigning Object Reference Variables</b>	<b>T1:48-56</b> R1:210-215
	11.	29/10/23	<b>Introducing Methods, Constructors</b>	<b>T1:57-69</b>
	12.	06/11/23	<b>The this Keyword, Garbage Collection.</b>	<b>T1:69-72</b>
	13.	06/11/23	<b>Methods and Classes: Overloading Methods</b>	<b>T1:73-73</b>
	14.	06/11/23	<b>Objects as Parameters</b>	<b>T1:73-77</b>
	15.	07/11/23	<b>Argument Passing, Returning Objects</b>	<b>T1:77-80</b>
	16	13/11/23	<b>Recursion, Access Control</b>	<b>T1:80-103</b>
	17.	13/11/23	<b>Understanding static</b>	<b>T1:105-109</b>
	18.	13/11/23	<b>Introducing final</b>	<b>T1:111-121</b>
	19.	14/11/23	<b>Introducing Nested</b>	<b>T1:121-121</b>
	20.	20/11/23	<b>Inner Classes</b>	<b>T1:122-128</b>
<b>III</b>	21.	20/11/23	<b>Inheritance: Inheritance Basics</b>	<b>T1:130-132</b>
	22.	20/11/23	<b>Using super, Creating a Multilevel Hierarchy</b>	<b>T1:132-134</b>
	23.	21/11/23	<b>When Constructors Are Executed, Method Overriding</b>	<b>T1:134-138</b>
	24.	03/01/24	<b>When Constructors Are Executed, Method Overriding-continue</b>	<b>T1:141-143</b>
	25.	03/01/24	<b>Dynamic Method Dispatch, Using Abstract Classes,</b>	<b>T1:157-166</b>
	26.	03/01/24	Using <b>final with</b> Inheritance,	<b>T1:167-170</b>

	27.	04/01/24	<b>Local Variable Type Inference and Inheritance, The Object Class.</b>	<b>T1:171-174</b>
	28.	10/01/24	<b>Interfaces: Interfaces, Default Interface Methods</b>	<b>T1:177-181</b>
	29.	10/01/24	<b>Use static Methods in an Interface</b>	<b>T1:183-185</b>
	30.	10/01/24	<b>Private Interface methods</b>	<b>T1:190-202</b>
<b>IV</b>	31.	11/01/24	<b>Packages and Member Access, Importing Packages.</b>	<b>T1:205-206 R5:220-225</b>
	32.	17/01/24	<b>Exceptions: Exception-Handling Fundamentals, Exception Types, Uncaught Exceptions, Using try and catch</b>	<b>T1:206-209</b>
	33.	17/01/24	<b>Multiple catch Clauses, Nested try Statements, throw</b>	<b>T1:211-216</b>
	34.	17/01/24	<b>throws, finally, Java's Built-in Exceptions</b>	<b>T1:217-219</b>
	35.	18/01/24	<b>Creating Your Own Exception Subclasses, Chained Exceptions.</b>	<b>T1:221-222</b>
<b>V</b>	36.	24/01/24	<b>Multithreaded Programming: The Java Thread Model,</b>	<b>T1:255-264</b>
	37.	24/01/24	<b>The Main Thread, Creating a Thread,</b>	<b>T1:285-288</b>
	38.	24/01/24	<b>Creating Multiple Threads, Using isAlive and join(),</b>	<b>T1:288-292</b>
	39.	25/01/24	<b>Thread Priorities, Synchronization, Interthread</b>	<b>T1:292-293</b>
	40.	31/01/24	<b>Communication, Suspending, Resuming, and Stopping Threads, Obtaining a Thread's State</b>	<b>T1:296-299</b>
	41.	31/01/24	<b>Enumerations, Type Wrappers and Autoboxing: Enumerations (Enumeration Fundamentals</b>	<b>T1:300-306</b>
	42.	31/01/24	<b>The values and valueOf() Methods),</b>	<b>T1:306-309</b>
	43.	01/02/24	<b>Type Wrappers (Character, Boolean, The Numeric Type Wrappers),</b>	<b>T1:312-312</b>
	44.	07/02/24	<b>Autoboxing</b>	<b>T1:359-364</b>
	45.	07/02/24	<b>Autoboxing and Methods</b>	<b>T1:365-369</b>
46.	07/02/24	<b>Autoboxing/Unboxing</b>	<b>T1:370-373</b>	

47.	08/02/24	<b>Occurs</b> in Autoboxing/Unboxing <b>Boolean</b> and Character Values).	<b>T1:374-374</b>
48.	09/02/24	Revision	<b>T1:375-375</b>
49.	10/02/24	Revision	<b>T1:376-384</b>
50.	10/02/24	Revision	

### **SELF-STUDY TOPICS (NOT INCLUDED IN SYLLABUS)**

<b>Sl. No.</b>	<b>Self –study Topics</b>	<b>Suggested Reference</b>
1.	Structures & Procedure–Oriented Programming system	R1 & R2.
2.	Applet functions	R2.

### **ASSIGNMENT TOPICS**

<b>Sl. No.</b>	<b>Assignment Topics</b>	<b>Submission due on</b>
1.	Classes and objects& Inheritance	20/04/23
2.	Programs based on Exception handling and Applets	25/05/23
3.	Character Extraction, String Comparison,	26/06/23

### **TEXT BOOKS:**

Java: The Complete Reference, Twelfth Edition, by Herbert Schildt, November 2021, McGraw-Hill, ISBN: 9781260463422

### **REFERENCE BOOKS:**

- 1.Programming with java, 6<sup>th</sup> Edition, By E Balagurusamy, Mar-2019, McGraw Hill, ISBN: 9781260463422
- 2.Thinking in Java, Fourth Edition. By Bruce Eckel, Prentice Hall, 2006



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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Name of the Department**

**LESSON PLAN**

**Faculty Name: Prof.varalakshmi.L**

**Academic Year: 2024-26**

**SUB.CODE & Name: ( 22MCA11 )Mathematical foundation for computer application**

**Year/Sem/Section: 2024- 2026/1<sup>st</sup> /MCA-A SEC**

**COURSE OBJECTIVES** This course will enable the student

**CLO1.** To introduce the concepts of mathematical logic

**CLO2.** To introduce the concepts of sets , relations, and functions.

**CLO3.**To perform the operations associated with sets, functions, and relations.

**CLO4.**To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.

**CLO5.**To use Graph Theory for solving problems.

**. COURSE OUTCOMES:**

<b>CO1</b>	Apply the fundamentals of set theory and matrices for the given problem
<b>CO2</b>	Apply the types of distribution , evaluate the mean and variance for the given case study/problem
<b>CO3</b>	Solve the given problem by applying the Mathematical logic concepts.
<b>CO4</b>	Model the given problem by applying the concepts of graph theory
<b>CO5</b>	Design strategy using gaming theory concepts for the given problem
<b>CO6</b>	Identify and list the different applications of discrete mathematical concepts in computer science.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	12-02-24	1	Introduction to sets	12-02-24	1	T1, R2	Chalk and talk
2.	13-02-24	5	Operation on sets	13-02-24	5	T1, R2	Chalk and talk
3.	14-02-24	5	Cardinality of sets	14-02-24	5	T1, R2	Chalk and talk
4.	15-02-24	6	Inclusion-exclusion principle	15-02-24	6	T1, R2	Chalk and talk
5.	19-02-24	1	Problems on inclusion-exclusion principle	19-02-24	1	T1, R2	Chalk and talk
6.	20-02-23	5	Pigeon hole principle problem	20-02-23	5	T1, R2	Chalk and talk
7.	22-02-23	5	Definition of matrices and problems related to eigen value and eigen vector	22-02-23	5	T1, R2	Chalk and talk
8.	26-02-23	6	Problems on finding eigen value and eigen problem	26-02-23	6	T1, R2	Chalk and talk
9.	27-02-23	1	Definition of function	27-02-23	1	T1, R2	Chalk and talk
10.	28-02-23	5	Types of functions	28-02-23	5	T1, R2	Chalk and talk
11.	29-03-23	5	Problems related on functions	29-03-23	5	T1, R2	Chalk and talk
12.	04-03-23	6	Theorems of functions	04-03-23	6	T1, R2	Chalk and talk
13.	05-03-23	1	Propositional logic	05-03-23	1	T1, R2	Chalk and talk
14.	06-03-23	5	Applications of propositional logic	06-03-23	5	T1, R2	Chalk and talk
15.	07-03-23	5	Propositional equivalents	07-03-23	5	T1, R2	Chalk and talk
16.	18-03-23	6	Predicates and related problems	18-03-23	6	T1, R2	Chalk and talk
17.	19-03-23	1	Quantifiers and related problems	19-03-23	1	T1, R2	Chalk and talk
18.	20-03-23	5	Types of quantifiers and related problems	20-03-23	5	T1, R2	Chalk and talk

19.	21-03-23	5	Nested quantifiers and related problems	21-03-23	5	T1, R2	Chalk and talk
20.	25-03-23	6	Rules of inferences and related Problems on rules of inferences on proposition	25-03-23	6	T1, R2	Chalk and talk
21.	26-03-23	1	Problems on proofs and disproofs	26-03-23	1	T1, R2	Chalk and talk
22.	28-03-23	5	Applications of propositional logic	28-03-23	5	T1, R2	Chalk and talk
23.	30-03-23	5	Propositional equivalents	30-03-23	5	T1, R2	Chalk and talk
24.	01-04-23	6	Predicates and related problems	01-04-23	6	T1, R2	Chalk and talk
25.	2-04-23	1	Quantifiers and related problems	2-04-23	1	T1, R2	Chalk and talk
26.	03-04-23	5	Types of quantifiers and related problems	03-04-23	5	T1, R2	Chalk and talk
27.	04-04-23	5	Nested quantifiers and related problems	04-04-23	5	T1, R2	Chalk and talk
28.	08-04-23	6	Rules of inferences and related Problems on rules of inferences on proposition	08-04-23	6	T1, R2	Chalk and talk
29.	10-04-23	1	Problems on proofs and disproofs	10-04-23	1	T1, R2	Chalk and talk
30.	12-04-23	5	Relations and examples of relations	12-04-23	5	T1, R2	Chalk and talk
31.	13-04-23	5	Relation and their properties, Problems on relations and their properties	13-04-23	5	T1, R2	Chalk and talk
32.	15-04-23	6	n-ary relations and their application	15-04-23	6	T1, R2	Chalk and talk
33.	22-04-23	1	Representing relation, Closures of relations and Equivalences relations	22-04-23	1	T1, R2	Chalk and talk
34.	23-04-23	5	Partial orderings	23-04-23	5	T1, R2	Chalk and talk
35.	24-04-23	5	Problems on partial ordering	24-04-23	5	T1, R2	Chalk and talk
36.	25-04-23	6	Lower bound and upper bound problem	25-04-23	6	T1, R2	Chalk and talk
37.	26-04-23	1	Hasse diagram and related problems on it	26-04-23	1	T1, R2	Chalk and talk
38.	27-05-23	5	Problems on relation and diagraph ,hasse diagram	27-05-23	5	T1, R2	Chalk and talk
39.	29-04-23	5	Lattice and poset theorm and problems related onit	29-04-23	5	T1, R2	Chalk and talk
40.	30-04-23	6	Concept of random variables	30-04-23	6	T1, R2	Chalk and talk

41.	26-04-23	1	Discrete probability distributions	26-04-23	1	T1, R2	Chalk and talk
42.	27-04-23	5	Problems on discrete probability distributions	27-04-23	5	T1, R2	Chalk and talk
43.	29-04-23	5	Mean ,variances and co-varariance and co –varianceof random variables	29-04-23	5	T1, R2	Chalk and talk
44.	30-04-23	6	Binomial distribution and related on it	30-04-23	6	T1, R2	Chalk and talk
45.	2-05-23	1	Poisson distribution, Problems related on poisson distribution	2-05-23	1	T1, R2	Chalk and talk
46.	3-05-23	5	Exponential,distribution, Problems related on Exponential distribution	3-05-23	5	T1, R2	Chalk and talk
47.	6-05-23	5	Normal distribution with mean and variables and problems	6-05-23	5	T1, R2	Chalk and talk
48.	7-05-23	6	Binomial distribution and related on it	7-05-23	6	T1, R2	Chalk and talk
49.	8-05-23	1	Poisson distribution, Problems related on poissondistribution	8-05-23	1	T1, R2	Chalk and talk
50.	9-05-23	5	Graphs and graphs models	9-05-23	5	T1, R2	Chalk and talk
51.	11-05-23	5	Graph terminology	11-05-23	5	T1, R2	Chalk and talk
52.	13-05-23	6	Special types of graphs	13-05-23	6	T1, R2	Chalk and talk
53.	14-05-23	1	Representing graphs	14-05-23	1	T1, R2	Chalk and talk
54.	16-05-23	5	Graph isomorphism	16-05-23	5	T1, R2	Chalk and talk
55.	17-05-23	5	Connectivity ,Euler and Hamilton paths	17-05-23	5	T1, R2	Chalk and talk
56.	24-5-23	6	Shortest-path problem	24-5-23	6	T1, R2	Chalk and talk
57.	25-5-23	1	Graph coloring and problems	25-5-23	1	T1, R2	Chalk and talk

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

Sr. No.	CCE Component	Submission due Date
1	ASSIGNMENT-1	15-03-22
2	ASSIGNMENT-2	21-04-22

**Pedagogy:** Chalk and board ,Active learning ,

**Text Books:**



1. Kenneth H Rosen, "Discrete Mathematics and its Applications", McGraw Hill publications, 7th edition.
2. Wolpole Myers Ye "Probability and Statistics for engineersand Scientist" Pearson Education, 8th edition

**Reference Book:**

1. . Richard A Johnson and C.B Gupta "Probability and statistics for engineers" Pearson Education
2. J.K Sharma "Discrete Mathematics", Mac Millian PublishersIndia, 3rd edition,2011.

**Faculty**

**HOD**

	 7/31/2024
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Department of ...  
The Oxford College of Engineering  
Hosur Road, BANGALORE





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Administrative Office:

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**Master of Computer Applications**

**LESSON PLAN**

**Faculty Name: Mrs. Sowmya J**

**Academic Year: 12/02/2024 to 25/05/2024**

**SUB.CODE&Name: Data Structure with Algorithm(22MCA13)**

**Year/Sem/Section: I /I /A**

**COURSE OBJECTIVES** This course will enable the students to  
 CLO1. Analyze step by step and develop algorithms to solve real world problems  
 CLO2. Evaluate the Expressions like postfix, prefix conversions.  
 CLO3. Implementing various data structures viz. Stacks, Queues, Linked Lists, Trees and Graphs  
 CLO4. Understanding various searching & sorting techniques  
 CLO5. Be able to understand Graph and Hashing Techniques.

**COURSE OUTCOMES:**

<b>CO1</b>	Explore different data structures, its operations
<b>CO2</b>	Demonstrate the concept of recursion and queue
<b>CO3</b>	Apply the concept of Linked list, Trees and Graphs in problem solving
<b>CO4</b>	Implement all data structures in a high level language for problem solving

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	12/2/24	5	Introduction of Data Structures	12/2/24	5	T1, R2	Smart board , ppt
2.	14/2/24	2	Classification of Data Structures: Primitive and Non- Primitive	14/2/24	2	T1, R2	Smart board , ppt
3.	15/2/24	1	Linear and Nonlinear, Data structure Operations	15/2/24	1	T1, R2	Smart board , ppt

4.	16/2/24	4	Stack: Definition, Representation	16/2/24	4	T1, R2	Smart board , ppt
5.	19/2/24	5	Stack Operation	19/2/24	5	T1, R2	Smart board , ppt
6.	21/2/24	2	Stack: Applications	21/2/24	2	T1, R2	Smart board , ppt
7.	22/2/24	1	Polish and reverse polish expressions	22/2/24	1	T1, R2	Smart board , ppt
8.	23/2/24	4	Infix to postfix conversion	23/2/24	4	T1, R2	Smart board , ppt
9.	23/2/24	4	Example of Infix to postfix	23/2/24	4	T1, R2	Smart board , ppt
10	24/2/24	2	Evaluation of postfix expression	24/2/24	2	T1, R2	Smart board , ppt
11	26/2/24	5	Infix to Prefix and Prefix to Infix conversion	26/2/24	5	T1, R2	Smart board , ppt
12	28/2/24	2	Recursion - Factorial	28/2/24	2	T1, R2	Smart board , ppt
13	29/2/24	5	Recursion - GCD	29/2/24	5	T1, R2	Smart board , ppt
14	01/3/24	1	Recursion - Fibonacci Sequence	01/3/24	1	T1, R2	Smart board , ppt
15	3/3/24	4	Fibonacci series examples	3/3/24	4	T1, R2	Smart board , ppt
16	6/3/24	5	Recursion - Tower of Hanoi	6/3/24	5	T1, R2	Smart board , ppt
17	7/3/24	2	Program of Tower of Hanoi	7/3/24	2	T1, R2	Smart board , ppt
18	9/3/24	4	Queue: Definition, Representation	9/5/24	4	T1, R2	Smart board , ppt
19	11/3/24	1	Queue Variants : Priority Queue	11/5/24	1	T1, R2	Smart board , ppt
20	12/3/24	CIE I					
21	13/3/24						
22	14/3/24						
23	15/3/24						
24	18/3/24	5	Circular Queue	18/3/24	5	T1, R2	Smart board , ppt
25	20/3/24	4	Double Ended Queue	20/3/24	4	T1, R2	Smart board , ppt
26	21/3/24	2	Examples of variates of queue	21/3/24	2	T1, R2	Smart board , ppt
27	21/3/24	1	Applications of Queues	21/3/24	1	T1, R2	Smart board , ppt
28	22/3/24	5	Programming Examples	22/3/24	5	T1, R2	Smart board , ppt
29	23/3/24	4	Linked List: Introduction	23/3/24	4	T1, R2	Smart board , ppt
30	25/3/24	1	Limitations of array implementation	25/3/24	1	T1, R2	Smart board

							, ppt
31	27/3/24	5	Memory Management: Static (Stack) and Dynamic (Heap)	27/3/24	5	T1, R2	Smart board , ppt
32	28/3/24	4	Memory Allocation methods	28/3/24	4	T1, R2	Smart board , ppt
33	30/3/24	2	Memory management functions- Definition,	30/3/24	2	T1, R2	Smart board , ppt
34	1/4/24	5	Representation of memory	1/4/24	5	T1, R2	Smart board , ppt
35	3/4/24	2	Operations: getnode()	3/4/24	2	T1, R2	Smart board , ppt
36	4/4/24	1	Freenode() operations	4/4/24	1	T1, R2	Smart board , ppt
37	5/4/24	4	Types: Singly Linked List.	5/4/24	4	T1, R2	Smart board , ppt
38	8/4/24	5	Linked list as a data Structure	8/4/24	5	T1, R2	Smart board , ppt
39	10/4/24	4	Linked implementations of stacks	10/4/24	4	T1, R2	Smart board , ppt
40	12/4/24	5	Stack with linked list examples	12/4/24	5	T1, R2	Smart board , ppt
41	13/4/24	1	Header nodes	13/4/24	1	T1, R2	Smart board , ppt
42	15/4/24	2	Array implementation of lists	15/4/24	2	T1, R2	Smart board , ppt
43	16/4/24	CIE II					
44	17/4/24						
45	18/4/24						
46	19/4/24						
47	22/4/24	4	Trees: Terminology, Binary Trees, Properties of Binary trees	22/4/24	4	T1, R2	Smart board , ppt
48	24/4/24	1	Threaded binary trees	24/4/24	1	T1, R2	Smart board , ppt
49	25/4/24	5	Array and linked Representation of Binary Trees	25/4/24	5	T1, R2	Smart board , ppt
50	26/5/24	4	Binary Tree Traversals –Inorder, Postorder, Preorder	26/5/24	4	T1, R2	Smart board , ppt
51	29/5/24	5	Binary Search Trees - Traversal, Searching ,Additional Binary tree operations	29/5/24	5	T1, R2	Smart board , ppt
52	30/5/24	1	Binary Tree Traversals –Inorder, Postorder, Preorder	30/5/24	1	T1, R2	Smart board , ppt
53	2/5/24	2	Application of Trees-Evaluation of Expression, Programming Examples	2/5/24	2	T1, R2	Smart board , ppt
54	3/5/24	1	Graphs: Definitions, Terminologies	3/5/24	1	T1, R2	Smart board , ppt
55	6/5/24	4	Representation of graphs	6/5/24	4	T1, R2	Smart board , ppt
56	8/5/24	1	Elementary Graph operations	8/5/24	1	T1, R2	Smart board , ppt

57	9/5/24	4	Traversal method: BFS	9/5/24	4	T1, R2	Smart board , ppt
58	11/5/24	4	Traversal method: DFS	11/5/24	4	T1, R2	Smart board , ppt
59	13/5/24	5	Hashing functions, Static and dynamic hashing	13/5/24	5	T1, R2	Smart board , ppt
60	14/5/24	1	Solving previous year question papers	14/5/24	1	T1, R2	Smart board , ppt
61	15/5/24	2	Solving previous year question papers	15/5/24	2	T1, R2	Smart board , ppt
62	16/5/24	5	Solving previous year question papers	16/5/24	5	T1, R2	Smart board , ppt
63	17/5/24	4	Solving previous year question papers	17/5/24	4	T1, R2	Smart board , ppt
64	20/5/24	<b>CIE III</b>					
65	21/5/24						
66	22/5/24						
67	23/5/24						
68	24/5/24	2	Solving previous year question papers	24/5/24	2	T1, R2	Smart board , ppt
69	25/5/24	5	Solving previous year question papers	25/5/24	5	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following**

- 1. Assignment**
- 2. Oral Quiz**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	Assignment	09/03/24
2	Oral Quiz	13/04/24

**Text Books:**


1. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures in C, 2nd Ed, Universities Press, 2014.
2. Seymour Lipschutz, Data Structures Schaum's Outlines, Revised 1st Ed, McGraw Hill, 2014.

**Reference Book:**

1. Gilberg & Forouzan, Data Structures: A Pseudo-code approach with C, 2nd Ed, Cengage Learning, 2014.
2. Reema Thareja, Data Structures using C, 3rd Ed, Oxford press, 2012.
3. Jean-Paul Tremblay & Paul G. Sorenson, An Introduction to Data Structures with Applications, 2 nd Ed, McGraw Hill, 2013.
4. A M Tenenbaum, Data Structures using C, PHI, 1989



**Faculty**



The Head  
Department of MCA  
The Oxford College of Engineering,  
Hosur Road, BANGALORE -

**HOD-MCA**





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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### Master Of Computer Of Applications

#### LESSON PLAN

**Faculty Name: Mary Anitha.T**

**Academic Year: 12/02/2024to 08/06/2024**

**SUB.CODE & Name: Computer network (22MCA14)**

**Year/Sem/Section:1<sup>st</sup> year / 1st sem/ A&B**

**COURSE OBJECTIVES** This course will enable the students to

**CO1:** Recognize computer networks.

**CO2:** List computer network topologies.

**CO3:** List required hardware to constitute computer network.

**CO4:** Explain each computer network topology physically or logically.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Apply the basic concepts of networks like protocol, internet and OSI layers
<b>CO2</b>	Analyze the working of Physical Layer.
<b>CO3</b>	Demonstrate the various Switching networks
<b>CO4</b>	Analyze the Data Link Layer

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	12/02/24	4,6	Data communications	12/02/24	4,6	T1, R2	Smart board , pp
2.	13/02/24	6,7	Components	13/02/24	6,7	T1, R2	Smart board , ppt
3.	14/02/24	4,1	Data Representations	14/02/24	4,1	T1, R2	Smart board , ppt
4.	15/02/24	2,6	Data Flows	15/02/24	2,6	T1, R2	Smart board , ppt

5.	16/02/24	4,6	Networks	16/02/24	4,6	T1, R2	Smart board , ppt	
6.	19/02/24	6,7	Distributed Processing	19/02/24	6,7	T1, R2	Smart board , ppt	
7.	20/02/24	4,1	Network Criteria	20/02/24	4,1	T1, R2	Smart board , ppt	
8.	21/02/24	2,6	Physical Structures	21/02/24	2,6	T1, R2	Smart board , ppt	
9.	22/02/24	4,6	Network Models	22/02/24	4,6	T1, R2	Smart board , ppt	
10	23/02/24	6,7	Categories of Networks	23/02/24	6,7	T1, R2	Smart board , ppt	
11	24/02/24	4,1	The Internet	24/02/24	4,1	T1, R2	Smart board , ppt	
12	26/02/24	2,6	ABrief History	26/02/24	2,6	T1, R2	Smart board , ppt	
13	26/02/24	4,6	The Internet Today	26/02/24	4,6	T1, R2	Smart board , ppt	
14	27/02/24	6,7	Protocols and Standards	27/02/24	6,7	T1, R2	Smart board , ppt	
15	28/02/24	4,1	The OSI Models.Layers	28/02/24	4,1	T1, R2	Smart board , ppt	
16	29/02/24	2,6	TCP/TP Protocol.Addressing	29/02/24	2,6	T1, R2	Smart board , ppt	
17	01/03/24	4,6	Analog and Digital	01/03/24	4,6	T1, R2	Smart board , ppt	
18	04/03/24	Periodic Analog Signals Digital Signals TCP/TP Protocol.Addressing					T1, R2	Smart board , ppt
19	05/03/24							
20	06/03/24							
21	07/03/24	4,6	Digital-to-Digital Conversion	07/03/24	4,6	T1, R2	Smart board , ppt	

22	09/03/24	6,7	Analog-to-Analog Conversion	09/03/24	6,7	T1, R2	Smart board , ppt
23	11/03/24	4,1	Digital-to-Analog Conversion	11/03/24	4,1	T1, R2	Smart board , ppt
24	12,13,14,15	<b>CIE-1</b> Multiplexing Frequency Division Multiplexing					
25	18/03/24					T1, R2	Smart board , ppt
26	20/03/24					T1, R2	Smart board , ppt
27	21/03/24	4,6	Wavelength -Division Multiplexing	21/03/24	4,6	T1, R2	Smart board , ppt
28	22/03/24	6,7	Synchronous Time Division Direct Sequence spread spectrum	22/03/24	6,7	T1, R2	Smart board , ppt
29	24/03/24	4,1	Statistical Time Division Circuit Switched Network	24/03/24	4,1	T1, R2	Smart board , ppt
30	27/03/24	2,6	Frequency Flopping Spread Three phases	27/03/24	2,6	T1, R2	Smart board , ppt
31	01/04/24	4,6		01/04/24	4,6	T1, R2	Smart board , ppt
32	02/04/24	4,1		02/04/24	4,1	T1, R2	Smart board , ppt
33	04/04/24	2,6		04/04/24	2,6	T1, R2	Smart board , ppt
34	08/04/24	2,6	Eficiency	08/04/24	2,6	T1, R2	Smart board , ppt
35	13/04/24	6,7	Delay	13/04/24	6,7	T1, R2	Smart board , ppt
36	16,17,18.19	<b>CIE-2</b>					
37	25/04/24	3.6	Circuit Switched Technology	25/04/24	3.6	T1, R2	Smart board , ppt
38	27/04/24	Datagram Networks Routing Table Efficiency					
39	03/05/24						
40	06/05/24						
41	08/05/24	4,1	Delay	08/05/24	4,1	T1, R2	Smart board , ppt
42	09/04/24	2,6	Datagram Networks in the Internet	09/04/24	2,6	T1, R2	Smart board , ppt
43	14/05/24	3,6	Virtual-Circuits Networks	14/05/24	3,6	T1, R2	Smart board , ppt
	15/05/24	1,6	Cyclic Codes,Protocols	15/05/24	1,6	T1, R2	Smart board , ppt
44	16/05/24	2,6	Checksum.Noiseless Channels	16/05/24	2,6	T1, R2	Smart board , ppt
45	20/05/24	4,1	HDLC	20/05/24	4,1	T1, R2	Smart board , ppt
46	23/05/24	Block coding Circuits Switched technology				T1, R2	Smart board , ppt
47	25/05/24					T1, R2	Smart board , ppt

48	28/05/24	Error Detection and Correction				T1, R2	Smart board , ppt
49	30/05/24	2,6	Point-to-Point Protocol	30/05/24	2,6	T1, R2	Smart board , ppt
50	31/05/24	3,6	Transition PPP	31/05/24	3,6	T1, R2	Smart board , ppt
51	03/04/05/06		CIE-3	03/04/05/06			
52	08/06/24	Revision					

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	10/02/24
2	Case Study	15/04/24

#### Text Books:

- Behrouz A. Forouzan, : Data Communication and Networking, 4 th Edition Tata McGraw-Hill, 2006

#### Reference Book:

- Alberto Leon-Garcia and Indra Widjaja: Communication Networks - Fundamental Concepts and Key architectures, 2nd Edition Tata McGraw-Hill, 2004.
- William Stallings: Data and Computer Communication, 8th Edition, Pearson Education, 2007.
- Larry L. Peterson and Bruce S. Davie: Computer Networks – A Systems Approach, 4th Edition, Elsevier, 2007.
- Nader F. Mir: Computer and Communication Networks, Pearson Education, 2007.

Mang Anirant  
Faculty



R. Prasad  
HOD

The Head  
Department of MCA  
The Oxford College of Engineering  
Hosur Road, BANGALORE -





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### Department of Computer Applications

#### LESSON PLAN

**Faculty Name:** Mridula Shukla

**Academic Year:** 2023-24

**SUB.CODE&Name:** 22RMI18 RESEARCH METHODOLOGY & IPR

**Year/Sem/Section:** 1/1/A

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To give an overview of the research methodology and explain the technique of defining a research problem.

CLO2. To explain the functions of the literature review in research

CLO3.. To explain carrying out a literature search, its review, developing theoretical and conceptual frameworks and writing a review

CLO4. To explain various research designs and their characteristics.

CLO5: To explain the details of sampling designs, measurement and scaling techniques and also different methods of data collections.

CLO6. To explain several parametric tests of hypotheses and Chi-square test.

CLO7. To explain the art of interpretation and the art of writing research reports.

CLO8. To explain various forms of the intellectual property, its relevance and business impact in the changing global business environment.

CLO9. To discuss leading International Instruments concerning Intellectual Property Rights.

#### COURSE OUTCOMES:

CO1	Identify the suitable research methods and articulate the research steps in a proper L2 sequence for the given problem.
CO2	Explain the functions of the literature review in research, carrying out a literature search developing theoretical and conceptual frameworks and writing a review.
CO3	Explain various research designs, sampling designs, measurement and scaling techniques.
CO4	Perform the data collection from various sources segregate the primary and secondary data.
CO5	Apply some concepts/section of Copy Right Act /Patent Act /Cyber Law/ Trademark to the given case and develop –conclusions

SL.N	Planned	TOPICS TO BE COVERED	Execution	Text	Pedagogy
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O						/Reference Book	(as per the syllabus)
	Date	Hr		Date	Hr		
1.	12/02/24	6	Introduction to Research Methodology, Meaning of Research	12/02/24	6	T1, R2	Smart board , ppt
2.	13/02/24	4	Objectives of Research, Motivation in Research	13/02/24	4	T1, R2	Smart board , ppt
3.	16/02/24	3	Types of Research	16/02/24	3	T1, R2	Smart board , ppt
4.	19/02/24	6	Research Approaches, Significance of Research,	19/02/24	6	T1, R2	Smart board , ppt
5.	20/02/24	4	Research Methods versus Methodology, Criteria of Good Research, and Problems Encountered by Researchers in India.	20/02/24	4	T1, R2	Smart board , ppt
6.	23/02/24	3	Research and Scientific Method,	23/02/24	3	T1, R2	Smart board , ppt
7.	24/02/24	6	Importance of Knowing How Research is Done, Research Process,	24/02/24	6	T1, R2	Smart board , ppt
8.	26/02/24	6	Criteria of Good Research, and	26/02/24	6	T1, R2	Smart board , ppt
9.	27/02/24	4	Problems Encountered by Researchers in India.	27/02/24	4	T1, R2	Smart board , ppt
10	1/03/24	3	Research Problem, Selecting the Problem, Necessity of Defining the Problem,	1/03/24	3	T1, R2	Smart board , ppt
11	4/03/24	6	Technique Involved in Defining a Problem, An Illustration.	4/03/24	6	T1, R2	Smart board , ppt
12	5/03/24	4	Reviewing the literature: Place of the literature review in research,	5/03/24	4	T1, R2	Smart board , ppt
13	9/03/24	3	Bringing clarity and focus to your research problem,	9/03/24	3	T1, R2	Smart board , ppt
14	11/03/24		CIE1	11/03/24		T1, R2	Smart board , ppt
15	12/03/24		CIE1	12/03/24		T1, R2	Smart board , ppt
16	15/03/24	6	Improving research methodology	15/03/24	6	T1, R2	Smart board , ppt
17	18/03/24	6	Broadening knowledge base in research area,	18/03/24	6	T1, R2	Smart board , ppt
18	19/03/24	4	Enabling contextual findings, How to review the literature,	19/03/24	4	T1, R2	Smart board , ppt
19	22/03/24	3	searching the existing literature, reviewing the selected literature,	22/03/24	3	T1, R2	Smart board , ppt
20	25/03/24	6	Developing a theoretical framework, Developing a conceptual framework	25/03/24	6	T1, R2	Smart board , ppt
21	26/03/24	4	Research Design ,Writing about the literature reviewed.	26/03/24	4	T1, R2	Smart board , ppt
22	1/04/24	6	Meaning of Research Design, Features of a Good Design,	1/04/24	6	T1, R2	Smart board , ppt
23	2/04/24	4	Need for Research Design, Important Concepts Relating to Research Design,	2/04/24	4	T1, R2	Smart board , ppt

24	5/04/24	3	Different Research Designs,	5/04/24	3	T1, R2	Smart board , ppt
25	8/04/24	6	Basic Principles of Experimental Designs,	8/04/24	6	T1, R2	Smart board , ppt
26	12/04/24	3	Important Experimental Designs	12/04/24	3	T1, R2	Smart board , ppt
27	13/04/24	3	Design of Sample Surveys: Introduction, Sample Design	13/04/24	3	T1, R2	Smart board , ppt
28	15/04/24	6	Sampling and Non-sampling Errors, Data Collection, Sample Survey versus Census Survey,	15/04/24	6	T1, R2	Smart board , ppt
29	16/04/24		CIE2			T1, R2	Smart board , ppt
30	19/04/24		CIE2			T1, R2	Smart board , ppt
31	22/04/24	6	Types of Sampling Designs Data Collection: Experimental and Surveys, Layout.	22/04/24	6	T1, R2	Smart board , ppt
32	23/04/24	4	Collection of Primary Data, Collection of Secondary Data,	23/04/24	4	T1, R2	Smart board , ppt
33	26/04/24	3	Selection of Appropriate Method for Data Collection, Case Study Method.	26/04/24	3	T1, R2	Smart board , ppt
34	27/04/24	6	Interpretation and Report Writing: Technique of Interpretation, Meaning of Interpretation, Precaution in Interpretation,	27/04/24	6	T1, R2	Smart board , ppt
35	29/04/24	6	Significance of Report Writing, Different Steps in Writing Report,	29/04/24	6	T1, R2	Smart board , ppt
36	30/04/24	4	Types of Reports	30/04/24	4	T1, R2	Smart board , ppt
37	3/05/24	3	Oral Presentation,	3/05/24	3	T1, R2	Smart board , ppt
38	6/05/24	6	Precautions for Writing Research Reports	6/05/24	6	T1, R2	Smart board , ppt
39	7/05/24	4	Intellectual Property (IP) Acts: Introduction to IP,	7/05/24	4	T1, R2	Smart board , ppt
40	11/05/24	3	different types of IPs and its importance in the present scenario,	11/05/24	3	T1, R2	Smart board , ppt
41	13/05/24	6	Patent Acts: Indian patent acts 1970.	13/05/24	6	T1, R2	Smart board , ppt
42	14/05/24	4	Design Act: Industrial Design act 2000. Copy right acts:	14/05/24	4	T1, R2	Smart board , ppt
43	17/05/24	3	Copyright Act 1957. Trade Mark Act, 1999	17/05/24	3	T1, R2	Smart board , ppt
44	20/05/24		CIE3			T1, R2	Smart board , ppt
45	21/05/24		CIE3			T1, R2	Smart board , ppt
46	24/05/24		Revision			T1, R2	Smart board , ppt

## Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment1	11/3/24
2	Assignment2	15/4/24


### Text Books:

1. Research Methodology: Methods and Techniques, C.R. Kothari, Gaurav Garg New Age International 4th Edition, 2018.
2. Research Methodology a step-by- step guide for beginners. (For the topic Reviewing the literature under module 2)  
Ranjit Kumar SAGE Publications Ltd 3rd Edition, 2011 Study Material.
3. Intellectual property, Debirag E. Bouchoux, Cengage learning, 2013.

### Reference Book:

1. Research Methods: the concise knowledge base Trochim, Atomic Dog Publishing, 2005.
2. Conducting Research Literature Reviews: From the Internet to Paper Fink A Sage Publications, 2009.

  
Faculty

  
The Head  
Department of MCA,  
The Oxford College of Engineering  
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### Master Of Computer Of Applications

#### LESSON PLAN

**Faculty Name: Mary Anitha.T**

**Academic Year: 11/12/2023 to 23/03/2024**

**SUB.CODE & Name: Internet of Things (22MCA32)**

**Year/Sem/Section: 2nd year / 3<sup>rd</sup> sem/ B**

**COURSE OBJECTIVES** This course will enable the students to

**CO1.** Define the IoT architecture and design along with functional/compute stack and data management.

**CO2.** Explain IOT architecture for a given problem

**CO3.** Analyse the application protocol, transport layer methods for the given business case.

**CO4.** Analyse the application of data analytics for IOT for a given

**CO5.** Analyse the architecture and develop programming using modern tools for the given use case

#### **COURSE OUTCOMES:**

<b>CO1</b>	Analyse the IoT architecture and design along with functional/compute stack and data management
<b>CO2</b>	Apply IOT architecture for a given problem.
<b>CO3</b>	Analyse the application protocol, transport layer methods for the given business case
<b>CO4</b>	Analyse the application of data analytics for IOT for a given.
<b>CO5</b>	Analyse the architecture and develop programming using modern tools for the given use case



SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/12/2023	2	Module 1:What is IoT. Genesis of IoT	11/12/2023	2	T1, R2	Smart board , pp
2.	12/12/2023	4	IoT and Digitization. IoT Impact	12/12/2023	4	T1, R2	Smart board , ppt
3.	13/12/2023	2	Convergence of IT and IoT, IoT Challenges	13/12/2023	2	T1, R2	Smart board , ppt
4.	14/12/2023	2	IoT Network Architecture and Design	14/12/2023	2	T1, R2	Smart board , ppt

5.	15/12/2023	3	Drivers Behind New Network Architectures	15/12/2023	3	T1, R2	Smart board , ppt
6.	18/12/2023	4	Comparing IoT Architectures	18/12/2023	4	T1, R2	Smart board , ppt
7.	19/12/2023	2	A Simplified IoT Architecture	19/12/2023	2	T1, R2	Smart board , ppt
8.	20/12/2023	2	The Core IoT Functional Stack	20/12/2023	2	T1, R2	Smart board , ppt
9.	21/12/2023	4	IoT Data Management	21/12/2023	4	T1, R2	Smart board , ppt
10	22/12/2023	2	Compute Stack	22/12/2023	2	T1, R2	Smart board , ppt
11	23/12/2023	3	Module 2:Smart (Objects	23/12/2023	3	T1, R2	Smart board , ppt
12	26/12/2023	4	The Things" in IoT	26/12/2023	4	T1, R2	Smart board , ppt
13	27/12/2023	2	Sensors,	27/12/2023	2	T1, R2	Smart board , ppt
14	28/12/2023	2	Actuators	28/12/2023	2	T1, R2	Smart board , ppt
15	29/12/2023	4	Smart Objects	29/12/2023	4	T1, R2	Smart board , ppt
16	30/12/2023	2	Sensor Networks	30/12/2023	2	T1, R2	Smart board , ppt
17	30/12/2023	2	Connecting Smart Object	30/12/2023	2	T1, R2	Smart board , ppt
18	01/01/2024		3Communications Criteria IoT Access Technologies Module 3:IP as the IoT Network Layer				
19	2/01/2024						
20	03/01/2024						
21	04/01/24	2	The Business Case for IP	04/01/24	2	T1, R2	Smart board , ppt

22	05/01/24	2	The need for Optimization	05/01/24	2	T1, R2	Smart board , ppt
23	8/01/2024	2	Optimizing IP for IoT	8/01/2024	2	T1, R2	Smart board , ppt
24	9/01/2024	<b>CIE-1</b>					
25	11,12,13						
26	16/01/2024						
27	17/01/2024	2	Profiles and Compliances	17/01/2024	2	T1, R2	Smart board , ppt
28	23/01/2024	2	Application Protocols for IoT	23/01/2024	2	T1, R2	Smart board , ppt
29	24/01/2024	4	The Transport Layer	24/01/2024	4	T1, R2	Smart board , ppt
30	25/01/2024	2	Transport Methods of IoT Application	25/01/2024	2	T1, R2	Smart board , ppt
32	27/01/2024	4	Module 4: Data and Analytics for IoT.	27/01/2024	4	T1, R2	Smart board , ppt
33	29/01/2024	4	An Introduction to Data Analytics for IoT	29/01/2024	4	T1, R2	Smart board , ppt
34	30/01/2024	2	Machine Learning	30/01/2024	2	T1, R2	Smart board , ppt
35	31/01/2024	2	Big Data Analytics Tools and Technology	31/01/2024	2	T1, R2	Smart board , ppt
36	1/02/2024	2	Edge Streaming Analytics	1/02/2024	2	T1, R2	Smart board , ppt
37	05/02/2024	2	Network Analytics.	05/02/2024	2	T1, R2	Smart board , ppt
38	12./02/24	<b>CIE-2</b>					
39	13./02/24						
40	14/02/24						
41	15/2/2024	2	How IT and OT Security Practices and Systems	15/2/2024	2	T1, R2	Smart board , ppt
42	16/2/2024	2	Formal Risk OCTAVE and FAIR Analysis Structures	16/2/2024	2	T1, R2	Smart board , ppt
43	19/2/2024	2	The Phased Application of Security in an Operational Environment	19/2/2024	2	T1, R2	Smart board , ppt
	20/2/2024	2	Module 5: IoT Physical Devices and Endpoints	20/2/2024	2	T1, R2	Smart board , ppt
44	21/2/2024	4	Introduction to Arduino, Installing the Software Arduino UNO	21/2/2024	4	T1, R2	Smart board , ppt
45	22/2/2024	4	Fundamentals of Arduino Programming	22/2/2024	4	T1, R2	Smart board , ppt
46	23/2/2024	2 IoT Physical Devices and Endpoints RaspberryPi: Introduction to Raspberry Pi				T1, R2	Smart board , ppt

47	26/2/2024	About the RaspberryPi Board: Hardware				T1, R2	Smart board , ppt
48	27/2/2024	Operating SystemsConfiguring RaspberryPi				T1, R2	Smart board , ppt
49	28/2/2024	2	Programming RaspberyPi with Python	28/2/2024	2	T1, R2	Smart board , ppt
50	29/2/2024	2	Wireless Temperature Monitoring System3 Using Pi. DSI8B20 Temperature Sensor	29/2/2024	2	T1, R2	Smart board , ppt
51	04/3/2024	4	,Smart City Security Architecture	04/3/2024	4	T1, R2	Smart board , ppt
52	9/3/2024	2 Smart City Use-Case Examples 4 Remote access to RaspberryPi, Smart and 3					
53	12/3/2024	2 Connected Cities					
54	18.19.20	<b>CIE-3</b>					
55	23/3/2024	Revision					

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	16.01.24
2	Case Study	20.02.24

#### Text Books:

1. David Hanes, Gonzalo Salueiro, Patrick Grossetete, Robert Barton, Jerone Henry, "Io't Fundamentals: Networking Technologies, Protocols, and Use Cases for the 2. Internet of Things",
2. Srinivasa K G, "Internet of Things".CENGAGE Leaning India, 2017.

**Reference Book:**

1. Vijay Madiseti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014. (ISBN: 978-8173719547)
2. Raj Kamal, "Internet of Things: Architecture and Design Principles", 1st Edition, McGraw Hill Education, 2017. (ISBN: 978-93 52605224)

Mangy Anirban  
Faculty

  
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THE HEAD  
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### Department of Computer Applications

#### LESSON PLAN

**Faculty Name:** Mridula Shukla

**Academic Year:** 2022-23

**SUB.CODE&Name:** 22MCA342 Introduction to Dot Net Framework for Application Development

**Year/Sem/Section:** 2/3/A&B

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Inspect Visual Studio programming environment and toolset designed to build applications for Microsoft Windows

CLO2. Explain Object Oriented Programming concepts in C# programming language.

CLO3. Interpret Interfaces and define custom interfaces for application.

CLO4. Build custom collections and generics in C#

CLO5: Explore events and query data using query expressions

#### COURSE OUTCOMES:

CO1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#.
CO2	Demonstrate Object Oriented Programming concepts in C# programming language .
CO3	Design custom interfaces for applications and leverage the available built-in interfaces in building complex applications.
CO4	Illustrate the use of generics and collections in C#

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/12/23	1	Introducing Microsoft Visual C# and Microsoft Visual Studio 2015:	11/12/23	1	T1, R2	Smart board , ppt



			Welcome to C#				
2.	12/12/23	1	Working with variables	12/12/23	1	T1, R2	Smart board , ppt
3.	13/12/23	3	operators and expressions	13/12/23	3	T1, R2	Smart board , ppt
4.	15/12/23	1	Writing methods	15/12/23	1	T1, R2	Smart board , ppt
5.	18/12/23	1	and applying scope	18/12/23	1	T1, R2	Smart board , ppt
6.	19/12/23	1	Using decision statements	19/12/23	1	T1, R2	Smart board , ppt
7.	20/12/23	3	Using compound assignment	20/12/23	3	T1, R2	Smart board , ppt
8.	22/12/23	1	iteration statements	22/12/23	1	T1, R2	Smart board , ppt
9.	23/12/23	1	Managing errors	23/12/23	1	T1, R2	Smart board , ppt
10.	26/12/23	1	and exceptions	26/12/23	1	T1, R2	Smart board , ppt
11.	27/12/23	3	Understanding the C# object model	27/12/23	3	T1, R2	Smart board , ppt
12.	29/12/23	1	Creating classes	29/12/23	1	T1, R2	Smart board , ppt
13.	30/12/23	1	and Managing classes	30/12/23	1	T1, R2	Smart board , ppt
14.	1/1/24	1	objects	1/1/24	1	T1, R2	Smart board , ppt
15.	2/1/24	1	Understanding values	2/1/24	1	T1, R2	Smart board , ppt
16.	3/1/24	3	Understanding references	3/1/24	3	T1, R2	Smart board , ppt
17.	5/1/24	1	Creating value types with enumerations	5/1/24	1	T1, R2	Smart board , ppt
18.	8/1/24	1	structures	8/1/24	1	T1, R2	Smart board , ppt
19.	9/1/24	1	Structures example	9/1/24	1	T1, R2	Smart board , ppt
20.	10/1/24	3	Using arrays	10/1/24	3	T1, R2	Smart board , ppt
21.	12/1/24	3	CIE-1	12/1/24	3	T1, R2	Smart board , ppt
22.	13/1/24	1	Array example	13/1/24	1	T1, R2	Smart board , ppt
23.	16/1/24	1	Understanding parameter arrays	16/1/24	1	T1, R2	Smart board , ppt
24.	17/1/24	1	parameter arrays examples	17/1/24	1	T1, R2	Smart board , ppt
25.	19/1/24	3	Working with inheritance	19/1/24	3	T1, R2	Smart board , ppt

26	22/1/24	1	Inheritance examples	22/1/24	1	T1, R2	Smart board , ppt
27	23/1/24	1	Creating interfaces	23/1/24	1	T1, R2	Smart board , ppt
28	24/1/24	3	Interface examples	24/1/24	3	T1, R2	Smart board , ppt
29	27/1/24	3	defining abstract classes	27/1/24	3	T1, R2	Smart board , ppt
30	29/1/24	1	abstract classes	29/1/24	1	T1, R2	Smart board , ppt
31	30/1/24	1	Using garbage collection	30/1/24	1	T1, R2	Smart board , ppt
32	31/1/24	3	resource management	31/1/24	3	T1, R2	Smart board , ppt
33	2/2/24	1	Defining Extensible Types with C#	2/2/24	1	T1, R2	Smart board , ppt
34	5/2/24	1	Implementing properties to access fields	5/2/24	1	T1, R2	Smart board , ppt
35	6/2/24	1	properties to access fields example	6/2/24	1	T1, R2	Smart board , ppt
36	7/2/24	3	Using indexers	7/2/24	3	T1, R2	Smart board , ppt
37	9/2/24	1	Indexers example	9/2/24	1	T1, R2	Smart board , ppt
38	12/2/24		CIE-2			T1, R2	Smart board , ppt
39	13/2/24					T1, R2	Smart board , ppt
40	14/2/24	3	Introducing generics	14/2/24	3	T1, R2	Smart board , ppt
41	16/2/24	1	Generics	16/2/24	1	T1, R2	Smart board , ppt
42	19/2/24	1	Generics example	19/2/24	1	T1, R2	Smart board , ppt
43	20/2/24	1	Using collections	20/2/24	1	T1, R2	Smart board , ppt
44	21/2/24	3	Collections example	21/2/24	3	T1, R2	Smart board , ppt
45	23/2/24	1	Collections	23/2/24	1	T1, R2	Smart board , ppt
46	24/2/24	1	Enumerating Collections	24/2/24	1	T1, R2	Smart board , ppt
47	26/2/24	1	Enumerating Collections example	26/2/24	1	T1, R2	Smart board , ppt
48	27/2/24	1	Decoupling application logic	27/2/24	1	T1, R2	Smart board , ppt
49	28/2/24	3	Decoupling application logic example	28/2/24	3	T1, R2	Smart board , ppt
50	1/3/24	1	handling events	1/3/24	1	T1, R2	Smart

							board , ppt
51	4/3/24	1	handling events example	4/3/24	1	T1, R2	Smart board , ppt
52	5/3/24	1	Querying in memory data by using query expressions	5/3/24	1	T1, R2	Smart board , ppt
53	6/3/24	3	Querying in memory data by using query expressions example	6/3/24	3	T1, R2	Smart board , ppt
54	9/3/24	1	Operator overloading	9/3/24	1	T1, R2	Smart board , ppt
55	11/3/24	1	Operator overloading example	11/3/24	1	T1, R2	Smart board , ppt
56	12/3/24	1	Revision	12/3/24	1	T1, R2	Smart board , ppt
57	13/3/24	3	Revision	13/3/24	3	T1, R2	Smart board , ppt
58	15/3/24	1	Revision	15/3/24	1	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment1	10/1/24
2	Assignment2	10/2/24

#### Text Books:

T1:John Sharp, Microsoft Visual C# Step by Step, 8th Edition, PHI Learning Pvt. Ltd. 2016

#### Reference Book:


R1. Christian Nagel, "C# 6 and .NET Core 1.0", 1st Edition, Wiley India Pvt Ltd, 2016. Andrew

R2. Stellman and Jennifer Greene, "Head First C#", 3rd Edition, O'Reilly Publications, 2013.

R3. Mark Michaelis, "Essential C# 6.0", 5th Edition, Pearson Education India, 2016.

R4. Andrew Troelsen, "Prof C# 5.0 and the .NET 4.5 Framework", 6th Edition, Apress and Dreamtech Press, 2012.

  
Faculty

  
HOD  
The Head  
Department of MCA  
The Oxford College of Engineering  
Hosur Road, BANGALORE



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Administrative Office:

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF MECHANICAL ENGINEERING

#### LESSON PLAN

**Faculty Name: Dr. Vidyadhar Pujar**

**Academic Year: 2023-2024**

**SUB.CODE & Name: BME301 & MECHANICS OF MATERIALS**

**Year/Sem/Section: 2<sup>nd</sup>/3<sup>rd</sup>**

**COURSE OBJECTIVES:** This course will enable the students to

CLO1. To provide the basic concepts and principles of strength of materials

CLO2. To give an ability to calculate stresses and deformations of objects under external loadings.

CLO3. To give an ability to apply the knowledge of strength of materials on engineering applications and Design problems.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Understand simple, compound, thermal stresses and strains their relations and strain energy
<b>CO2</b>	Analyse structural members for stresses, strains and deformations.
<b>CO3</b>	Analyse the structural members subjected to bending and shear loads
<b>CO4</b>	Analyse shafts subjected to twisting loads.
<b>CO5</b>	Analyse the short columns for stability

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	15/11/23	1st	Simple stress and strain: Definition/derivation of normal stress, shear stress	15/11/23	1st	T1	Chalk and talk method for problem-solving
2	16/11/23	2nd	normal strain and shear strain – Stress strain diagram for brittle and ductile materials	16/11/23	2nd	T1	Chalk and talk method for problem
3	17/11/23	4 <sup>th</sup>	Poisson's ratio & volumetric strain –	17/11/23	4 <sup>th</sup>	T1	Chalk and talk method for problem

			Elastic constants – relationship between elastic constants and Poisson's ratio				
<b>4</b>	20/11/23	4th	relationship between elastic constants and Poisson's ratio	20/11/23	4th	T1	Chalk and talk method for problem
<b>5</b>	21/11/23	2nd	Generalized Hook's law – Deformation of simple and compound bars	21/11/23	2nd	T1	Chalk and talk method for problem
<b>6</b>	22/11/23	1st	Resilience, Gradual, sudden, impact and shock loadings	22/11/23	1st	T1	Chalk and talk method for problem
<b>7</b>	23/11/23	2nd	Thermal stresses.	23/11/23	2nd	T1	Chalk and talk method for problem
<b>8</b>	24/11/23	4 <sup>th</sup>	Numericals	24/11/23	4 <sup>th</sup>	T1	Chalk and talk method for problem
<b>9</b>	25/11/23	4th	Numericals	25/11/23	4th	T1	Chalk and talk method for problem
<b>10</b>	27/11/23	2nd	Numericals	27/11/23	2nd	T1	Chalk and talk method for problem
<b>11</b>	28/11/23	1st	Numericals	28/11/23	1st	T1	Chalk and talk method for problem
<b>12</b>	29/11/23	2nd	Numericals	29/11/23	2nd	T1	Chalk and talk method for problem
<b>13</b>	01/12/23	4 <sup>th</sup>	Numericals	01/12/23	4 <sup>th</sup>	T1	Chalk and talk method for problem
<b>14</b>	04/12/23	4th	Bi-axial Stress system: Introduction, plane stress, stresses on inclined sections	04/12/23	4th	T1	Adopt collaborative (Group Learning) Learning in the class.
<b>15</b>	05/12/23	2nd	principal stresses and maximum shear stresses	05/12/23	2nd	T1	PPT
<b>16</b>	06/12/23	1st	Graphical method - Mohr's circle for plane stress.	06/12/23	1st	T1	PPT
<b>17</b>	07/12/23	2nd	Thick and Thin cylinders: Stresses in thin cylinders	07/12/23	2nd	T1	PPT
<b>18</b>	08/12/23	4 <sup>th</sup>	Lame's equation for thick cylinders subjected to internal and external pressures	08/12/23	4 <sup>th</sup>	T1	PPT
<b>19</b>	09/12/23	4th	Changes in dimensions of cylinder (diameter, length and volume),	09/12/23	4th	T1	PPT



			simple numerical.				
<b>20</b>	11/12/23	2nd	Bending moment and Shear forces in beams: Definition of beam – Types of beams	11/12/23	2nd	T2	PPT
<b>21</b>	12/12/23	1st	Concept of shear force and bending moment	12/12/23	1st	T2	PPT
<b>22</b>	13/12/23	2nd	S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads	13/12/23	2nd	T2	Chalk and talk method for problem
<b>23</b>	14/12/23	4 <sup>th</sup>	uniformly distributed loads, uniformly varying loads and combination of these loads – Point of contra flexure.	14/12/23	4 <sup>th</sup>	T2	Chalk and talk method for problem
<b>23</b>	15/12/23	4th	Theory of simple bending – Assumptions – Derivation of bending equation	15/12/23	4th	T2	Chalk and talk method for problem
<b>25</b>	18/12/23	2nd	Neutral axis – Determination of bending stresses	18/12/23	2nd	T2	Chalk and talk method for problem
<b>26</b>	19/12/23	1st	section modulus of rectangular and circular sections (Solid and Hollow), I, T and Channel sections	19/12/23	1st	T2	Chalk and talk method for problem
<b>27</b>	20/12/23	2nd	– Design of simple beam sections, Shear Stresses: Derivation of formula	20/12/23	2nd	T2	Chalk and talk method for problem
<b>28</b>	21/12/23	4 <sup>th</sup>	Shear stress distribution across various beams sections like rectangular, circular, triangular, I, and T sections.	21/12/23	4 <sup>th</sup>	T2	Chalk and talk method for problem
<b>29</b>	22/12/23	4th	Torsion of circular shafts: Introduction, pure torsion	22/12/23	4th	T2	PPT
<b>30</b>	23/12/23	2nd	assumptions, derivation of tensional equations	23/12/23	2nd	T2	PPT
<b>31</b>	01/01/24	1st	polar modulus, tensional rigidity / stiffness of shafts	01/01/24	1st	T2	PPT
<b>32</b>	02/01/24	2nd	power transmitted by solid and hollow circular shafts.	02/01/24	2nd	T2	PPT
<b>33</b>	03/01/24	4 <sup>th</sup>	Theory of columns – Long column and short column - Euler's formula	03/01/24	4 <sup>th</sup>	T2	PPT

			– Rankine’s formula.				
<b>34</b>	04/01/24	4th	Numericals	04/01/24	4th	T2	PPT
<b>35</b>	05/01/24	2nd	Euler’s formula	05/01/24	2nd	T2	PPT
<b>36</b>	08/01/24	1st	Euler’s formula	08/01/24	1st	T2	PPT
<b>37</b>	09/01/24	2nd	Euler’s formula	09/01/24	2nd	T2	PPT
<b>38</b>	10/01/24	4 <sup>th</sup>	Euler’s formula	10/01/24	4 <sup>th</sup>	T2	PPT
<b>39</b>	11/01/24	4th	Numericals	11/01/24	4th	T2	PPT
<b>40</b>	12/01/24	2nd	Numericals	12/01/24	2nd	T2	PPT
<b>41</b>	13/01/24	1st	Numericals	13/01/24	1st	T2	PPT
<b>42</b>	16/01/24	2nd	Numericals	16/01/24	2nd	T2	PPT
<b>43</b>	17/01/24	4 <sup>th</sup>	Numericals	17/01/24	4 <sup>th</sup>	T2	PPT
<b>44</b>	18/01/24	4th	Numericals	18/01/24	4th	T2	PPT
<b>45</b>	19/01/24	2nd	Numericals	19/01/24	2nd	T2	PPT
<b>46</b>	22/01/24	1st	Revision	22/01/24	1st	T2	Chalk and talk method for problem
<b>47</b>	23/01/24	2nd	Revision	23/01/24	2nd	T2	Chalk and talk method for problem
<b>48</b>	24/01/24	4 <sup>th</sup>	Revision	24/01/24	4 <sup>th</sup>	T2	Chalk and talk method for problem
<b>49</b>	25/01/24	4th	Revision	25/01/24	4th	T2	Chalk and talk method for problem
<b>50</b>	27/01/24	2nd	Revision	27/01/24	2nd	T2	Chalk and talk method for problem
<b>51</b>	29/01/24	1st	Revision	29/01/24	1st	T2	Chalk and talk method for problem
<b>52</b>	30/01/24	2nd	Revision	30/01/24	2nd	T2	Chalk and talk method for problem
<b>53</b>	31/01/24	4 <sup>th</sup>	Revision	31/01/24	4 <sup>th</sup>	T2	Chalk and talk method for problem
<b>54</b>	05/2/24	4th	Revision	05/2/24	4th	T2	Chalk and talk method for problem
<b>55</b>	06/2/24	2nd	Revision	06/2/24	2nd	T2	Chalk and talk method for problem
<b>56</b>	07/2/24	1st	Revision	07/2/24	1st	T2	Chalk and talk method for problem
<b>57</b>	20/2/24	2nd	Revision	20/2/24	2nd	T2	Chalk and talk method for problem

## Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	23/12/23
2	PPT	06/02/24

### Text Books:

1. Mechanics of Materials, K.V.Rao, G.C.Raju, Subhash Stores, First Edition, 2007
2. Strength of Materials by R.K. Bansal ,Laxmi Publications 2010

### Reference Book:

1. Mechanics of Materials, S.I. Units, Ferdinand Beer & Russell Johnstan
2. Statics and Strength of Materials, Shehata, 2nd edition, 1994.

Vidyaadhas, Pujar

**FACULTY**

G.M.J.

**HOD**

Professor & Head  
Department of Mechanical Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560068.



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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### **DEPARTMENT OF MECHANICAL ENGINEERING**

#### **LESSON PLAN**

**Faculty Name: Dr. Varun K R**

**Academic Year: 2023-2024**

**SUB.CODE&Name: BME304 & Basic Thermodynamics**

**Year/Sem/Section:2<sup>nd</sup>/3<sup>rd</sup>**

**COURSE OBJECTIVES:** This course will enable the students to

CLO1. Learn about thermodynamic system and its equilibrium, basic law of zeroth law of thermodynamics.

CLO2. Understand various forms of energy - heat transfer and work, Study the first law of thermodynamics.

CLO3. Study the second law of thermodynamics.

CLO4. Interpret the behaviour of pure substances and its application in practical problems.

CLO5. Study of Ideal and real gases and evaluation of thermodynamic properties

#### **COURSE OUTCOMES:**

<b>CO1</b>	Explain fundamentals of thermodynamics and evaluate energy interactions across the boundary of thermodynamic systems.
<b>CO2</b>	Apply 1 <sup>st</sup> law of thermodynamics to closed and open systems and determine quantity of energy transfers.
<b>CO3</b>	Evaluate the feasibility of cyclic and non-cyclic processes using 2 <sup>nd</sup> law of thermodynamics
<b>CO4</b>	Apply the knowledge of entropy, reversibility and irreversibility to solve numerical problems and Interpret the behaviour of pure substances and its application in practical problems
<b>CO5</b>	Recognize differences between ideal and real gases and evaluate thermodynamic properties of ideal and real gas mixtures using various relations.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11	2nd	Thermodynamic definition and scope, Microscopic and Macroscopic approaches	15/11	2nd	T1	Chalk and talk method
2.	17/11	1st	Characteristics of system boundary and control surface, examples	17/11	1st	T1	Chalk and talk method
3.	20/11	4th	Thermodynamic properties; definitions	20/11	4th	T1	Chalk and talk method
4.	20/11	7th	Thermodynamic equilibrium	20/11	7th	T1	Chalk and talk method
5.	21/11	1st	Temperature; concepts, scales	21/11	1st	T1	Chalk and talk method
6.	22/11	2nd	Numerical	22/11	2nd	T1	Chalk and talk method
7.	24/11	1st	Numerical	24/11	1st	T1	Chalk and talk method
8.	27/11	4th	Mechanics, definition of work and its limitations, sign convention	27/11	4th	T1	Chalk and talk method
9.	27/11	7th	Types of work	27/11	7th	T1	Chalk and talk method
10.	28/11	1st	Numerical	28/11	1st	T1	Chalk and talk method
11.	29/11	2nd	Numerical	29/11	2nd	T1	Chalk and talk method
12.	1/12	1st	Joules experiment	1/12	1st	T1	Chalk and talk method
13.	9/10	1st	equivalence of heat and work	9/10	1st	T1	Chalk and talk method
14.	4/12	4th	energy as a property	4/12	4th	T1	Chalk and talk method
15.	5/12	1st	Problems	5/12	1st	T1	Chalk and talk method
16.	6/12	2nd	Problems	6/12	2nd	T1	Chalk and talk method
17.	8/12	1st	Steady flow energy equation (SFEE)	8/12	1st	T1	Chalk and talk method
18.	11/12	4th	Numericals	11/12	4th	T1	Chalk and talk method
19.	12/12	1st	Numericals	12/12	1st	T1	Chalk and talk method
20.	13/12	2nd	Introduction to 2nd law	13/12	2nd	T2	Chalk and talk method



21.	15/12	1st	Thermal reservoir, heat engine and heat pump	15/12	1st	T2	Chalk and talk method
22.	18/12	4th	Kelvin - Planck statement of the Second law of Thermodynamics; PMM I and PMM II, Clausius statement of Second law of Thermodynamics	18/12	4th	T2	Chalk and talk method
23.	18/12	7th	Equivalence	18/12	7th	T2	Chalk and talk method
24.	19/12	1st	Carnot cycle, Carnot principles	19/12	1st	T2	Chalk and talk method
25.	20/12	2nd	Numericals	20/12	2nd	T2	Chalk and talk method
26.	22/12	1st	Entropy	22/12	1st	T2	Chalk and talk method
27.	1/1	4th	Entropy	1/1	4th	T2	Chalk and talk method
28.	1/1	7th	Numericals	1/1	7th	T2	Chalk and talk method
29.	2/1	1st	Numericals	2/1	1st	T2	Chalk and talk method
30.	3/1	2nd	Availability	3/1	2nd	T2	Chalk and talk method
31.	5/1	1st	Availability (Exergy), Unavailable energy	5/1	1st	T2	Chalk and talk method
32.	8/1	4th	Relation between increase in unavailable energy and increase in entropy	8/1	4th	T2	Chalk and talk method
33.	8/1	7th	Maximum work, maximum useful work for a system and control volume	8/1	7th	T2	Chalk and talk method
34.	9/1	1st	irreversibility	9/1	1st	T2	Chalk and talk method
35.	10/1	2nd	Explanation and numerical of Irreversibility	10/1	2nd	T2	Chalk and talk method
36.	12/1	1st	pure substance	12/1	1st	T2	Chalk and talk method
37.	16/1	1st	Sub-cooled liquid, saturated liquid, mixture of saturated liquid and vapor, saturated vapor and superheated vapor states of pure substance with water as example	16/1	1st	T2	Chalk and talk method
38.	17/1	2nd	Enthalpy of change of phase (Latent heat). Dryness fraction	17/1	2nd	T2	Chalk and talk method

			(quality), T-S and H-S diagrams, representation of various processes on these diagrams				
39.	19/12	1st	Throttling calorimeter, separating and throttling calorimeter	19/12	1st	T2	Chalk and talk method
40.	22/12	4th	Numericals on Pure substance	22/12	4th	T2	Chalk and talk method
41.	22/12	7th	Numericals on Pure substance	22/12	7th	T2	Chalk and talk method
42.	23/12	1st	Ideal gas mixtures, Daltons law of partial pressures, Amagat's law of additive volumes	23/12	1st	T2	Chalk and talk method
43.	24/1	2nd	evaluation of properties of perfect and ideal gases	24/1	2nd	T2	Chalk and talk method
44.	29/1	4th	Air- Water mixtures and related properties	29/1	4th	T2	Chalk and talk method
45.	29/1	7th	Air- Water mixtures and related properties	29/1	7th	T2	Chalk and talk method
46.	30/1	1st	Introduction, Van-der Waal's Equation of state, Van-der Waal's constants in terms of critical properties, Beattie-Bridgeman equation	30/1	1st	T2	Chalk and talk method
47.	31/12	2nd	Law of corresponding states, compressibility factor; compressibility chart.	31/12	2nd	T2	Chalk and talk method
48.	2/2	1st	Numerical	2/2	1st	T2	Chalk and talk method
49.	5/2	4th	Numerical	5/2	4th	T2	Chalk and talk method
50.	5/2	7th	Numerical	5/2	7th	T2	Chalk and talk method
51.	6/2	1st	Numerical	6/2	1st	T2	Chalk and talk method
52.	7/2	2nd	Thermodynamic relations	7/2	2nd	T2	Chalk and talk method
53.	9/2	1st	TdS equation	9/2	1st	T2	Chalk and talk method
54.	19/2	4th	Revision	19/2	4th	T2	Chalk and talk method
55.	19/2	7th	Revision	19/2	7th	T2	Chalk and talk method
56.	20/2	1 <sup>st</sup>	Revision	20/2	1 <sup>st</sup>	T2	Chalk and talk method

### Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	23/12/23
2	Chalk and talk method	06/02/24

#### Text Books:

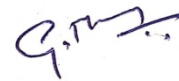
1. Basic Engineering Thermodynamics A.Venkatesh Universities Press, 2008.
2. Basic Thermodynamics, B.K Venkanna, Swati B. Wadavadagi PHI, New Delhi 2010.

#### Reference Book:

1. Basic and Applied Thermodynamics P.K.Nag, Tata McGraw Hill 2nd Ed., 2002.
2. Thermodynamics- An Engineering Approach YunusA.Cenegal and Michael A.Boles Tata McGraw Hill publications 2002



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## THE OXFORD COLLEGE OF ENGINEERING

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi & Approved by A.I.C.T.E. New Delhi, accredited by NAAC with A Grade, New Delhi and Recognized by UGC Under Section 2(f) Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### DEPARTMENT OF MECHANICAL ENGINEERING

#### LESSON PLAN

**Faculty Name: Dr. Prasad H Nayak**

**Academic Year: 2023-2024**

**SUB.CODE & Name: 21ME51 & THEORY OF MACHINES**

**Year/Sem/Section: 3<sup>rd</sup>/5<sup>th</sup>**

**COURSE OBJECTIVES:** This course will enable the students to

CLO1: To understand the concept of machines, mechanisms and to analyze a mechanism for displacement, velocity and acceleration at any point in a moving link.

CLO2: To understand the theory of gears and gear trains

CLO3: To understand the force-motion relationship in components subjected to external forces and analysis of standard mechanisms

CLO4: To understand the undesirable effects of unbalances resulting from prescribed motions in mechanism

CLO5: To understand the principles in mechanisms used for speed control and stability control

CLO6: To compute the natural and damped frequencies of free 1-DOF mechanical systems and to analyze the vibrational motion of 1-DOF mechanical systems under harmonic excitation conditions.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Knowledge of mechanisms and their motion and the inversions of mechanisms.
<b>CO2</b>	Analyse the velocity, acceleration of links and joints of mechanisms..
<b>CO3</b>	Analyse the mechanisms for static and dynamic equilibrium
<b>CO4</b>	Carry out the balancing of rotating and reciprocating masses
<b>CO5</b>	Analyse different types of governors used in real life situation.
<b>CO6</b>	Analyze the free and forced vibration phenomenon.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	27/11/23	1 <sup>st</sup>	Introduction: Mechanisms and machines	27/11/23	1 <sup>st</sup>	Theory of Machines Sadhu	Chalk and talk method

						Singh	
2	28/11/23	2 <sup>nd</sup>	Kinematic pairs-types	4/12/23	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
3	29/11/23	1 <sup>st</sup>	degree of freedom, Kinematic chains and their classification	5/12/23	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
4	4/12/23	2 <sup>nd</sup>	Kinematic inversions	6/12/23	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
5	5/12/23	1 <sup>st</sup>	Velocity and Acceleration analysis of planar mechanisms Graphical method: Velocity and Acceleration Analysis of Mechanisms Velocity and acceleration analysis of four bar mechanism	7/12/23	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
6	6/12/23	2 <sup>nd</sup>	slider crank mechanism	11/12/23	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
7	7/12/23	1 <sup>st</sup>	Mechanism illustrating Corioli's component of acceleration	12/12/23	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
8	11/12/23	2 <sup>nd</sup>	Angular velocity and angular acceleration of links	13/12/23	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
9	12/12/23	1 <sup>st</sup>	velocity of rubbing	14/12/23	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
10	13/12/23	2 <sup>nd</sup>	Velocity and Acceleration Analysis of Mechanisms (Analytical Method): Velocity and acceleration analysis of four bar mechanism	18/12/23	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
11	14/12/23	1 <sup>st</sup>	slider crank mechanism using complex algebra method	19/12/23	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
12	18/12/23	2 <sup>nd</sup>	Static force analysis: Static equilibrium, analysis of four bar mechanism	20/12/23	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
13	19/12/23	1 <sup>st</sup>	slider crank mechanism.	21/12/23	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
14	20/12/23	2 <sup>nd</sup>	Dynamic force analysis: D'Alembert's principle, analysis of four bar	28/12/23	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
15	21/12/23	1 <sup>st</sup>	slider crank mechanism	28/12/23	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
16	26/12/23	2 <sup>nd</sup>	Flywheel: Introduction to Flywheel and calculation of its size for simple machines like punching machine	1/1/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
17	27/12/23	1 <sup>st</sup>	shearing machine	2/1/24	2 <sup>nd</sup>	Theory of Machines Sadhu	Chalk and talk method



						Singh	
18	28/12/23	2 <sup>nd</sup>	Spur Gears: Gear terminology	3/1/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
19	1/1/24	1 <sup>st</sup>	law of gearing, path of contact	4/1/24	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
20	2/1/24	2 <sup>nd</sup>	arc of contact, contact ratio of spur gear	8/1/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
21	3/1/24	1 <sup>st</sup>	Interference in involute gears, methods of avoiding interference	9/1/24	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
22	4/1/24	2 <sup>nd</sup>	condition and expressions for minimum number of teeth to avoid interference.	10/1/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
23	8/1/24	1 <sup>st</sup>	Gear Trains: Simple gear trains, compound gear trains	11/1/24	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
24	9/1/24	2 <sup>nd</sup>	Epicyclic gear trains: Algebraic and tabular methods of finding velocity ratio of epicyclic gear trains	16/1/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
25	10/1/24	1 <sup>st</sup>	torque calculation in epicyclic gear trains. Discussions on applications of gear trains	17/1/24	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
26	11/1/24	2 <sup>nd</sup>	Numericals	18/1/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
27	16/1/24	1 <sup>st</sup>	Numericals	22/1/24	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
28	17/1/24	2 <sup>nd</sup>	Numericals	23/1/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
29	18/1/24	1 <sup>st</sup>	Balancing of Rotating Masses: Static and Dynamic Balancing	24/1/24	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Conduct laboratory demonstrations
30	22/1/24	2 <sup>nd</sup>	Balancing of single rotating mass by balancing masses in same plane	25/1/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
31	23/1/24	1 <sup>st</sup>	Balancing of single rotating mass by balancing masses in different plane	1/2/24	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
32	24/1/24	2 <sup>nd</sup>	Balancing of several rotating masses by balancing masses in same plane	5/2/24	1 <sup>st</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
33	25/1/24	1 <sup>st</sup>	Balancing of several rotating masses by balancing masses in different plane	6/2/24	2 <sup>nd</sup>	Theory of Machines Sadhu Singh	Chalk and talk method
34	1/2/24	2 <sup>nd</sup>	Discussions on applications	7/2/24	1 <sup>st</sup>	Theory of Machines Sadhu	Chalk and talk method

						Singh	
35	5/2/24	1st	Numericals	8/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
36	6/2/24	2nd	Numericals	12/2/24	1st	Theory of Machines Sadhu Singh	Chalk and talk method
37	7/2/24	1st	Balancing of Reciprocating Masses: Inertia Effect of crank and connecting rod, Single cylinder Engine	13/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
38	8/2/24	2nd	Balancing in multi cylinder-inline engine (primary and secondary forces)	14/2/24	1st	Theory of Machines Sadhu Singh	Chalk and talk method
39	12/2/24	1st	Discussions on applications	15/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
40	13/2/24	2nd	Governors:Types of Governors; Force Analysis of Porter and Hartnell Governors	19/2/24	1st	Theory of Machines Sadhu Singh	Chalk and talk method
41	14/2/24	1st	Controlling Force, Stability, Sensitiveness, Isochronism, Effort and Power	20/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
42	15/2/24	2nd	Discussion on applications.	21/2/24	1st	Theory of Machines Sadhu Singh	Chalk and talk method
43	19/2/24	1st	Free vibrations: Basic elements of vibrating system, Types of free vibrations, Longitudinal vibrations	22/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
44	20/2/24	2nd	Equilibrium method, D'Alembert's principle	26/2/24	1st	Theory of Machines Sadhu Singh	Chalk and talk method
45	21/2/24	1st	Determination of natural frequency of single degree freedom systems	26/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
46	22/2/24	2nd	Damped free vibrations: Under damped, over damped and critically damped systems	27/2/24	1st	Theory of Machines Sadhu Singh	Chalk and talk method
47	26/2/24	1st	Logarithmic decrement	27/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
48	27/2/24	2nd	Forced vibrations: Undamped forced vibration of spring mass system, Damped forced vibrations	28/2/24	1st	Theory of Machines Sadhu Singh	Chalk and talk method
49	28/2/24	1st	Rotating unbalance, Reciprocating unbalance	28/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
50	29/2/24	2nd	Vibration isolation, Critical speed.	29/2/24	2nd	Theory of Machines Sadhu Singh	Chalk and talk method
51	7/3/24	1st	Discussions on applications.	7/3/24	1st	Theory of Machines Sadhu Singh	Chalk and talk method

## Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment 1	20/12/23
2	Assignment 2	19/2/24

### Text Books:

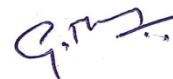
- 1 Theory of Machines Kinematics and Dynamics Sadhu Singh Pearson Third edition 2019
- 2 Mechanism and Machine Theory G. Ambekar PHI 2009

### Reference Book:

- 1 Theory of Machines Rattan S.S Tata McGraw-Hill Publishing Company 2014
- 2 Mechanisms and Machines- Kinematics, Dynamics and Synthesis Michael M Stanisic Cengage Learning



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Professor & Head  
Department of Mechanical Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560068.



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### DEPARTMENT OF MECHANICAL ENGINEERING

#### LESSON PLAN

**Faculty Name: Dr. Madhu Sudana Reddy G**

**Academic Year: 2023-2024**

**SUB.CODE & Name: 21RMI56 & Research Methodology & Intellectual Property Rights**

**Year/ Sem /Section: 3rd / V<sup>th</sup>**

**COURSE OBJECTIVES** This course will enable the students to  
 CLO1. To Understand the knowledge on basics of research and its types.  
 CLO2. To Learn the concept of Literature Review, Technical Reading, Attributions and Citations.  
 CLO3. To Learn Ethics in Engineering Research.  
 CLO4. To Discuss the concepts of Intellectual Property Rights in engineering.

#### **COURSE OUTCOMES:**

<b>CO1</b>	To know the meaning of engineering research.
<b>CO2</b>	To know the procedure of Literature Review and Technical Reading.
<b>CO3</b>	To know the fundamentals of patent laws and drafting procedure .
<b>CO4</b>	Understanding the copyright laws and subject matters of copyrights and designs
<b>CO5</b>	Understanding the basic principles of design rights .

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	29/11/23	3 <sup>rd</sup>	Meaning of Research, Objectives of Engineering Research	29/11/23	3 <sup>rd</sup>	T1	Chalk and talk method for problem-solving
2	01/12/23	2 <sup>nd</sup>	Motivation in Engineering Research, Types of Engineering Research	01/12/23	2 <sup>nd</sup>	T1	Chalk and talk method for problem
3	06/12/23	3 <sup>rd</sup>	Finding and Solving a Worthwhile Problem.	06/12/23	3 <sup>rd</sup>	T1	Chalk and talk method for problem
4	08/12/23	2 <sup>nd</sup>	Ethics in Engineering Research, Ethics in	08/12/23	2 <sup>nd</sup>	T1	Chalk and talk method for

			Engineering Research Practice,				problem
5	09/12/23	2 <sup>nd</sup>	Types of Research Misconduct, Ethical Issues Related to Authorship.	09/12/23	2 <sup>nd</sup>	T1	Chalk and talk method for problem
6	13/12/23	3 <sup>rd</sup>	New and Existing Knowledge, Analysis and Synthesis of Prior Art Bibliographic Databases,	13/12/23	3 <sup>rd</sup>	T1	Chalk and talk method for problem
7	15/12/23	2 <sup>nd</sup>	Web of Science, Google and Google Scholar, Effective Search	15/12/23	2 <sup>nd</sup>	T1	Chalk and talk method for problem
8	20/12/23	3 <sup>rd</sup>	The Way Forward Introduction to Technical Reading Conceptualizing Research, Critical and Creative Reading,	20/12/23	3 <sup>rd</sup>	T1	Chalk and talk method for problem
9	22/12/23	3 <sup>rd</sup>	Taking Notes While Reading, Reading Mathematics and Algorithms, Reading a Datasheet.	22/12/23	3 <sup>rd</sup>	T1	Chalk and talk method for problem
10	27/12/23	3 <sup>rd</sup>	Attributions and Citations: Giving Credit Wherever Due, Citations: Functions and Attributes, Impact of Title and Keywords on Citations,	27/12/23	3 <sup>rd</sup>	T1	Chalk and talk method for problem
11	03/01/24	3 <sup>rd</sup>	Knowledge Flow through Citation, Citing Datasets, Styles for Citations, Acknowledgments and Attributions,	03/01/24	3 <sup>rd</sup>	T1	Chalk and talk method for problem
12	05/01/24	2 <sup>nd</sup>	What Should Be Acknowledged, Acknowledgments in, Books Dissertations, Dedication or Acknowledgments.	05/01/24	2 <sup>nd</sup>	T1	Chalk and talk method for problem
13	10/01/24	3 <sup>rd</sup>	Introduction To Intellectual Property: Role of IP in the Economic and Cultural Development of the Society, IP Governance, IP as a Global Indicator of Innovation	10/01/24	3 <sup>rd</sup>	T1	Chalk and talk method for problem
15	12/01/24	2 <sup>nd</sup>	Origin of IP History of IP in India. Major Amendments in IP Laws and Acts in India.	12/01/24	2 <sup>nd</sup>	T1	Chalk and talk method for problem
16	17/01/24	3 <sup>rd</sup>	To Patent or Not to Patent an Invention. Rights Associated with Patents. Enforcement of Patent Rights. Inventions Eligible	17/01/24	3 <sup>rd</sup>	T1	Chalk and talk method for problem



			for Patenting. Non-Patentable Matters. Patent Infringements.				
17	19/01/24	2 <sup>nd</sup>	Avoid Public Disclosure of an Invention before Patenting. Process of Patenting. Prior Art Search. Choice of Application to be Filed. Patent Application Forms. Jurisdiction of Filing Patent Application. Publication. Pre-grant Opposition. Examination	19/01/24	2 <sup>nd</sup>	T1	Chalk and talk method for problem
18	24/01/24	3 <sup>rd</sup>	Post-grant Opposition. Commercialization of a Patent. Need for a Patent Attorney/Agent. Can a Worldwide Patent be Obtained. Do I Need First to File a Patent in India. Patent Related Forms. Fee Structure. Types of Patent Applications. Commonly Used Terms in Patenting. National Bodies Dealing with Patent Affairs. Utility Models.	24/01/24	3 <sup>rd</sup>	T1	Chalk and talk method for problem
19	27/01/24	3 <sup>rd</sup>	Process of Patenting. Prior Art Search. Choice of Application to be Filed. Patent Application Forms. Jurisdiction of Filing Patent Application. Publication. Pre-grant Opposition. Examination. Grant of a Patent. Validity of Patent Protection. Post-grant Opposition.	27/01/24	3 <sup>rd</sup>	T1	Chalk and talk method for problem
20	02/02/24	2 <sup>nd</sup>	Commercialization of a Patent. Need for a Patent Attorney/Agent. Can a Worldwide Patent be Obtained. Do I Need First to File a Patent in India. Patent Related Forms. Fee Structure. Types of Patent Applications. Commonly Used Terms in Patenting. National Bodies Dealing with Patent Affairs. Utility Models.	02/02/24	2 <sup>nd</sup>	T2	Chalk and talk method for problem
21	07/02/24	3 <sup>rd</sup>	Classes of Copyrights. Criteria for Copyright. Ownership of Copyright. Copyrights of the Author.	07/02/24	3 <sup>rd</sup>	T2	Chalk and talk method for problem

			Copyright Infringements. Copyright Infringement is a Criminal Offence. Copyright Infringement is a Cognizable Offence. Fair Use Doctrine.				
22	09/02/24	2 <sup>nd</sup>	Copyrights and Internet. Non-Copyright Work. Copyright Registration. Judicial Powers of the Registrar of Copyrights. Fee Structure. Copyright Symbol. Validity of Copyright. Copyright Profile of India. Copyright and the word 'Publish'. Transfer of Copyrights to a Publisher. Copyrights and the Word 'Adaptation'.	09/02/24	2 <sup>nd</sup>	T2	Chalk and talk method for problem
23	14/02/24	3 <sup>rd</sup>	Copyrights and the Word 'Indian Work'. Joint Authorship. Copyright Society. Copyright Board. Copyright Enforcement Advisory Council (CEAC). International Copyright Agreements, Conventions and Treaties. Interesting Copyrights Cases.	14/02/24	3 <sup>rd</sup>	T2	Chalk and talk method for problem
24	16/02/24	2 <sup>nd</sup>	Trademarks: Eligibility Criteria. Who Can Apply for a Trademark. Acts and Laws. Designation of Trademark Symbols. Classification of Trademarks. Registration of a Trademark is Not Compulsory. Validity of Trademark. Types of Trademark Registered in India.	16/02/24	2 <sup>nd</sup>	T2	Chalk and talk method for problem
25	21/02/24	3 <sup>rd</sup>	Trademark Registry. Process for Trademarks Registration. Prior Art Search. Famous Case Law: Coca-Cola Company vs. Bisleri International Pvt. Ltd.	21/02/24	3 <sup>rd</sup>	T2	Chalk and talk method for problem
26	23/02/24	2 <sup>nd</sup>	Industrial Designs: Eligibility Criteria. Acts and Laws to Govern Industrial Designs. Design Rights. Enforcement of Design Rights. Non-Protectable Industrial Designs India.	23/02/24	2 <sup>nd</sup>	T2	Chalk and talk method for problem

			Protection Term. Procedure for Registration of Industrial Designs. Prior Art Search.				
27	24/02/24	2 <sup>nd</sup>	Application for Registration. Duration of the Registration of a Design. Importance of Design Registration. Cancellation of the Registered Design. Application Forms. Classification of Industrial Designs. Designs Registration Trend in India. International Treaties. Famous Case Law: Apple Inc. vs. Samsung Electronics Co.	24/02/24	2 <sup>nd</sup>	T2	Chalk and talk method for problem
28	28/02/24	3 <sup>rd</sup>	Geographical Indications: Acts, Laws and Rules Pertaining to GI. Ownership of GI. Rights Granted to the Holders. Registered GI in India. Identification of Registered GI. Classes of GI. Non-Registerable GI. Protection of GI. Collective or Certification Marks.	28/02/24	3 <sup>rd</sup>	T2	Chalk and talk method for problem
29	01/03/24	2 <sup>nd</sup>	Enforcement of GI Rights. Procedure for GI Registration Documents Required for GI Registration. GI Ecosystem in India. Case Studies on Patents. Case study of Curcuma (Turmeric) Patent, Case study of Neem Patent, Case study of Basmati patent. IP Organizations In India. Schemes and Programmes	01/03/24	2 <sup>nd</sup>	T2	Chalk and talk method for problem

### Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	20/12/23
2	Assignment	19/01/24
3	Seminar	01/02/24

### **Text Books:**


1. Dipankar Deb • Rajeeb Dey, Valentina E. Balas “Engineering Research Methodology”, ISSN 1868-4394 ISSN 1868-4408 (electronic), Intelligent Systems Reference Library, ISBN 978-981-13-2946-3 ISBN 978-981-13-2947-0 (eBook), <https://doi.org/10.1007/978-981-13-2947-0>
2. Intellectual Property A Primer for Academia by Prof. Rupinder Tewari Ms. Mamta Bhardwa

### **Reference Book:**

1. David V. Thiel “Research Methods for Engineers” Cambridge University Press, 978-1-107-03488- 4
2. Intellectual Property Rights by N.K.Acharya Asia Law House 6th Edition. ISBN: 978-93-81849-30-9



**Faculty**



**HOD**

Professor & Head  
Department of Mechanical Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560068.

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Administrative Office:

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### DEPARTMENT OF MECHANICAL ENGINEERING

#### LESSON PLAN

**Faculty Name: Dr. Varun K R**

**Academic Year: 2023-2024**

**SUB.CODE & Name: 18EE753 & Disaster Management**

**Year/Sem/Section: 4<sup>th</sup>/7<sup>th</sup>**

**COURSE OBJECTIVES:** This course will enable the students to  
CLO1. To explain disaster management, its planning, occurrence of cyclones and their hazard potential  
CLO2. To explain the role of IMD, cyclone prediction and cyclone warning system in India  
CLO3. To explain the role of different institutions, defence and other services in natural disaster management.  
CLO4. To explain the role of Central Water Commission in river water sharing, Draught  
CLO5. To explain reasons for the occurrence of earth quake, Tsunamis and thunderstorms..

#### **COURSE OUTCOMES:**

<b>CO1</b>	Discuss disaster management plan, cyclones and their hazard potential
<b>CO2</b>	Understand the role of IMD and cyclone prediction and cyclone warning system in India.
<b>CO3</b>	Understand the role of different institutions defence and other services in natural disaster management.
<b>CO4</b>	Understand the role of Central water Commission in river water sharing, Draught, its assessment and draught management plan
<b>CO5</b>	Understand occurrence of earth quake, Tsunamis and thunderstorms

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1	11.9.23	1 <sup>st</sup>	Disaster Management Plan (DMP): - General.	11.9.23	1 <sup>st</sup>	T1	Chalk and talk method
2	13.9.23	4 <sup>th</sup>	Disaster Management Plan (DMP): - General.	13.9.23	4 <sup>th</sup>	T1	Chalk and talk method
3	14.9.23	2 <sup>nd</sup>	Cyclones and their Hazard Potential: Classification of Low-Pressure Systems	14.9.23	2 <sup>nd</sup>	T1	Chalk and talk method



<b>4</b>	15.9.23	2 <sup>nd</sup>	Classification of Low-Pressure Systems	15.9.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>5</b>	20.9.23	4 <sup>th</sup>	Statistics of Cyclonic Storms Over Indian Seas,	20.9.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>6</b>	21.9.23	2 <sup>nd</sup>	Movement of Cyclones in Indian Seas, Storm Surges.	21.9.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>7</b>	22.9.23	2 <sup>nd</sup>	Module-2 India Meteorological Department and Cyclone Warnings in India: Hazard Potential of Cyclonic Storms	22.9.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>8</b>	25.9.23	1 <sup>st</sup>	Hazard Potential of Cyclonic Storms	25.9.23	1 <sup>st</sup>	T1	Chalk and talk method
<b>9</b>	27.9.23	4 <sup>th</sup>	Cyclone Prediction and Dissemination of Warnings	27.9.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>10</b>	29.9.23	2 <sup>nd</sup>	Dissemination of Cyclone Warnings,	29.9.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>11</b>	04.10.23	4 <sup>th</sup>	Cycle opening Warnings through INSAT, Port Warnings with Day and Night hoisting Signals	04.10.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>12</b>	05.10.23	2 <sup>nd</sup>	Cyclones Disaster Management – Plan: Hazard Potentials Associated with Cyclones	05.10.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>13</b>	06.10.23	2 <sup>nd</sup>	Hazard Potentials Associated with Cyclones, Vulnerability Reduction	06.10.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>14</b>	9.10.23	1 <sup>st</sup>	Early Warning.	9.10.23	1 <sup>st</sup>	T1	Chalk and talk method
<b>15</b>	11.10.23	4 <sup>th</sup>	Module-3 Action Plan for Cyclone Disaster Management.	11.10.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>16</b>	12.10.23	2 <sup>nd</sup>	Role of Different Institutions in Natural Disaster Management: Role of Zilla Parishad	12.10.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>17</b>	13.10.23	2 <sup>nd</sup>	Role of PRA Groups in Disaster Management	13.10.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>18</b>	19.10.23	2 <sup>nd</sup>	Role of NGOs	19.10.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>19</b>	25.10.23	4 <sup>th</sup>	Self Help Groups in Disaster Management	25.10.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>20</b>	26.10.23	2 <sup>nd</sup>	Role of Red Cross in Disaster Management.	26.10.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>21</b>	27.10.23	2 <sup>nd</sup>	The Role of Defence and other Services in Disaster Management: Role of Air Force in Disaster Management	27.10.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>22</b>	30.10.23	1 <sup>st</sup>	Role of Medical and Health Department in Cyclone disaster management	30.10.23	1 <sup>st</sup>	T1	Chalk and talk method
<b>23</b>	02.11.23	2 <sup>nd</sup>	National Disaster Response Force	02.11.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>24</b>	03.11.23	2 <sup>nd</sup>	Role of Remote Sensing in Disaster Management	03.11.23	2 <sup>nd</sup>	T1	Chalk and talk method

<b>25</b>	06.11.23	1 <sup>st</sup>	Role of Broadcast	06.11.23	1 <sup>st</sup>	T1	Chalk and talk method
<b>26</b>	08.11.23	4 <sup>th</sup>	Educational Media in disaster management	08.11.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>27</b>	09.11.23	2 <sup>nd</sup>	Module-4 Floods: Water Wealth of India, Definition of Flood	09.11.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>28</b>	10.11.23	2 <sup>nd</sup>	Role of Central Water Commission	10.11.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>29</b>	11.11.23	1 <sup>st</sup>	Monsoons, Flood Warning Signals and Precautionary Actions	11.11.23	1 <sup>st</sup>	T1	Conduct laboratory demonstrations
<b>30</b>	13.11.23	1 <sup>st</sup>	Water Purification Technologies in Flood Affected Areas.	13.11.23	1 <sup>st</sup>	T1	Chalk and talk method
<b>31</b>	15.11.23	4 <sup>th</sup>	Water Purification Technologies in Flood Affected Areas.	15.11.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>32</b>	16.11.23	2 <sup>nd</sup>	Drought: Meteorological Drought, Breaks in the Monsoon	16.11.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>33</b>	17.11.23	2 <sup>nd</sup>	Drought Management Plan	17.11.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>34</b>	23.11.23	2 <sup>nd</sup>	Drought Years for Different Met Subdivision of India	23.11.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>35</b>	24.11.23	2 <sup>nd</sup>	Drought Assesment, Drought Parameters	24.11.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>36</b>	25.11.23	4 <sup>th</sup>	Role of Banking, Role of Insurance	25.11.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>37</b>	27.11.23	1 <sup>st</sup>	Role of Microfinance in drought mitigation	27.11.23	1 <sup>st</sup>	T1	Chalk and talk method
<b>38</b>	29.11.23	4 <sup>th</sup>	Drought Monitoring, Drought Research Unit (IMD)	29.11.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>39</b>	1.12.23	2 <sup>nd</sup>	Rainwater harvesting.	1.12.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>40</b>	4.12.23	1 <sup>st</sup>	Module-5 Earth quakes: Interior Structure of the Earth	4.12.23	1 <sup>st</sup>	T1	Chalk and talk method
<b>41</b>	6.12.23	4 <sup>th</sup>	Plate Techtonics, Seismcity of India	6.12.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>42</b>	7.12.23	2 <sup>nd</sup>	Earthquake Forecast and disaster management, Tsunamis, Landslides and Avalanches, Volcanoes.	7.12.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>43</b>	8.12.23	2 <sup>nd</sup>	Hazards associated with Convective Clouds: Climatology of World Thunderstorms, Lightning, Some Effects of Electric Shock	8.12.23	2 <sup>nd</sup>	T1	Chalk and talk method
<b>44</b>	11.12.23	1 <sup>st</sup>	Favours and Frownings of Thunderstorms, Hailstorms, Tornadoes, Waterspouts	11.12.23	1 <sup>st</sup>	T1	Chalk and talk method
<b>45</b>	13.12.23	4 <sup>th</sup>	DustDevils, Now casting, Summer Thunderstorms over India	13.12.23	4 <sup>th</sup>	T1	Chalk and talk method
<b>46</b>	14.12.23	2 <sup>nd</sup>	Cold Waves and Heat Waves in India, Tsunami introduction,	14.12.23	2 <sup>nd</sup>	T1	Chalk and talk method

			Precautionary measures, Landslide introduction factors causing it, Prevention measures				
47	15.12.23	2 <sup>nd</sup>	Avalanche preventive measures introduction	15.12.23	2 <sup>nd</sup>	T1	Chalk and talk method
48	18.12.23	1 <sup>st</sup>	Volcanoes, classification forecasting , its hazards	18.12.23	1 <sup>st</sup>	T1	Chalk and talk method
49	20.12.23	4 <sup>th</sup>	Convective clouds its development and hazards, Thunderbolt storm condition favorable for it	20.12.23	4 <sup>th</sup>	T1	Chalk and talk method
50	21.12.23	2 <sup>nd</sup>	Climatology of world thunderstorm, Lightning, its types, Effects of electric shock	21.12.23	2 <sup>nd</sup>	T1	Chalk and talk method
51	22.12.23	2 <sup>nd</sup>	Favour and frowning of thunder storms, Aviation hazards, Safety measures from lightening hazards	22.12.23	2 <sup>nd</sup>	T1	Chalk and talk method
52	1.1.24	1 <sup>st</sup>	Introduction to hailstorms favorable conditions, Hail storm damages - preventive measures	1.1.24	1 <sup>st</sup>	T1	Chalk and talk method
53	3.1.24	4 <sup>th</sup>	Tornados safety measures water spouts, Dust devils	3.1.24	4 <sup>th</sup>	T1	Chalk and talk method
54	4.1.24	2 <sup>nd</sup>	Now castings introduction its effects, Summer thunders over India	4.1.24	2 <sup>nd</sup>	T1	Chalk and talk method
55	5.1.24	2 <sup>nd</sup>	Cold waves in India condition favorable for it, Heat waves in India conditions favorable for it	5.1.24	2 <sup>nd</sup>	T1	Chalk and talk method
56	6.1.24	4 <sup>th</sup>	Prevention and preparedness for hot and cold waves	6.1.24	4 <sup>th</sup>	T1	Chalk and talk method

### Continuous and Comprehensive Evaluation (CCE)

Sr. No.	CCE Component	Submission due Date
1	Assignment	25/10/23
2	Group Discussion	07/12/23

#### Text Books:

1. Earth and Atmospheric Disasters Management Natural and Man-made



**FACULTY**



**HOD**

Professor & Head  
Department of Mechanical Engineering  
The Oxford College of Engineering  
Bommanahalli, Bangalore - 560068.



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Administrative Office:

1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

☎: 080-61754501 – 502 Fax: 080-2654 8658

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 15/11/23 to 20/2/24**

**SUB.CODE & Name: MECHANICS OF SOLIDS AND FLUIDS 21MT34**

**Year/Sem/Section: 2<sup>ND</sup> / 3<sup>RD</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Gain knowledge of linear elastic properties and stress strain relations.

CLO2. Derive and solve problems on Principal stresses developed in structures.

CLO3. Compute the stress strain for bars, beams, shafts, and column and to apply the concept of dynamic similarity and to apply it to experimental modelling.

CLO4. Gain knowledge of basic properties of fluids, fluid statics.

CLO5: To apply conservation of mass, momentum and energy equation.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain the knowledge of properties, and stress-strain relations in linear elastic solid members and fluids. To understand the concepts of fluid statics, kinematics and dynamics.
<b>CO2</b>	Describe stress-strain equation for axial, bending and torsion loads while addressing problems in engineering
<b>CO3</b>	Apply the concepts of fluid statics, kinematics and dynamics while addressing problems in engineering and to determine the fluid flow through open and closed channel.
<b>CO4</b>	Determine the stress & strain for simple stresses, compound stresses, shafts & columns.
<b>CO5</b>	To apply conservation of mass, momentum and energy equation and to determine the discharge of fluid flow.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11/23	4	Simple Stress and Strain: Introduction	15/11/23	4	T1, R2	Smart board , ppt
2.	16/11/23	4	Concept of Stress and Strain, Linear elasticity, Hooke's Law and Poisson's ratio.	16/11/23	4	T1, R2	Smart board , ppt
3.	16/11/23	3	Concept of Stress and Strain, Linear elasticity, Hooke's Law and Poisson's ratio.	16/11/23	3	T1, R2	Smart board , ppt
4.	17/11/23	1	Concept of Stress and Strain, Linear elasticity,	17/11/23	1	T1, R2	Smart board , ppt
5.	17/11/23	3	Extension / Shortening of a bar, bars with varying cross sections	17/11/23	3	T1, R2	Smart board , ppt
6.	20/11/23	4	Extension / Shortening of a bar, bars with varying cross sections	20/11/23	4	T1, R2	Smart board , ppt
7.	21/11/23	4	Extension / Shortening of a bar, bars with varying cross sections	21/11/23	4	T1, R2	Smart board , ppt
8.	22/11/23	3	Elongation due to self-weight	22/11/23	3	T1, R2	Smart board , ppt
9.	23/11/23	1	Elongation due to self-weight	23/11/23	1	T1, R2	Smart board , ppt
10	24/11/23	3	Principle of super position, St. Venant's Principle.	24/11/23	3	T1, R2	Smart board , ppt
11	24/11/23	4	expression for volumetric strain	24/11/23	4	T1, R2	Smart board , ppt
12	24/11/23	4	Elastic Constants and relations.	24/11/23	4	T1, R2	Smart board , ppt
13	27/11/23	3	Stresses in Composite Section	27/11/23	3	T1, R2	Smart board , ppt
14	28/11/23	1	Compound Stresses: Introduction	28/11/23	1	T1, R2	Smart board , ppt
15	28/11/23	3	Concept of Plane stress, Stress tensor for plane stress	28/11/23	3	T1, R2	Smart board , ppt
16	29/11/23	4	Concept of Plane stress, Stress tensor for plane stress	29/11/23	4	T1, R2	Smart board , ppt
17	29/11/23	4	stresses on inclined sections	29/11/23	4	T1, R2	Smart board , ppt
18	1/12/23	3	stresses on inclined sections	1/12/23	3	T1, R2	Smart board , ppt
19	1/12/23	1	principal stresses and	1/12/23	1	T1, R2	Smart



			maximum shear stresses,				board , ppt
20	4/12/23	3	Mohr's circle for plane stress.	4/12/23	3	T1, R2	Smart board , ppt
21	5/12/23	4	Mohr's circle for plane stress.	5/12/23	4	T1, R2	Smart board , ppt
22	6/12/23	4	Torsion of Circular Shafts: Introduction Pure torsion, assumptions,	6/12/23	4	T1, R2	Smart board , ppt
23	7/12/23	3	derivation of torsional equations,	7/12/23	3	T1, R2	Smart board , ppt
24	8/12/23	1	Polar modulus, torsional rigidity / stiffness of shafts	8/12/23	1	T1, R2	Smart board , ppt
25	11/12/23	3	Power transmitted by solid shaft	11/12/23	3	T1, R2	Smart board , ppt
26	12/12/23	4	Euler's theory for axially loaded elastic long columns	12/12/23	4	T1, R2	Smart board , ppt
27	13/12/23	4	Derivation of Euler's load for various end conditions	13/12/23	4	T1, R2	Smart board , ppt
28	14/12/23	3	limitations of Euler's theory, Rankine's formula.	14/12/23	3	T1, R2	Smart board , ppt
29	15/12/23	1	introduction to Fluid mechanics: Introduction, Properties of fluids- mass density, weight density, specific volume, specific gravity, viscosity, surface tension, capillarity	15/12/23	1	T1, R2	Smart board , ppt
30	18/12/23	3	vapour pressure, compressibility and bulk modulus. Concept	18/12/23	3	T1, R2	Smart board , ppt
31	19/12/23	4	vapour pressure, compressibility and bulk modulus. Concept	19/12/23	4	T1, R2	Smart board , ppt
32	20/12/23	4	vapour pressure, compressibility and bulk modulus. Concept	20/12/23	4	T1, R2	Smart board , ppt
33	21/12/23	3	types of fluids pressure at a point in the static mass of fluid, variation of pressure	21/12/23	3	T1, R2	Smart board , ppt
34	22/12/23	1	types of fluids pressure at a point in the static mass of fluid, variation of pressure	22/12/23	1	T1, R2	Smart board , ppt
35	26/12/23	CIE 1					
36	27/12/23						
37	28/12/23						
38	29/12/23						
39	1/1/24	3	. types of fluids pressure at a point in the static mass of fluid, variation of pressure	1/1/24	3	T1, R2	Smart board , ppt
40	2/1/24	4	Pascal's law, absolute, gauge,	2/1/24	4	T1, R2	Smart

			atmospheric and vacuum pressures; pressure measurement by simple,				board , ppt
41	3/1/24	4	Pascal's law, absolute, gauge, atmospheric and vacuum pressures; pressure measurement by simple,	3/1/24	4	T1, R2	Smart board , ppt
42	4/1/24	3	Total pressure and centre of pressure for horizontal plane,	4/1/24	3	T1, R2	Smart board , ppt
43	5/1/24	1	Total pressure and centre of pressure for horizontal plane,	5/1/24	1	T1, R2	Smart board , ppt
44	8/1/24	3	vertical plane surface and inclined plane surface submerged in static fluid.	8/1/24	3	T1, R2	Smart board , ppt
45	9/1/24	4	vertical plane surface and inclined plane surface submerged in static fluid.	9/1/24	4	T1, R2	Smart board , ppt
46	10/1/24	4	Fluid Kinematics: Velocity of fluid particle, types of fluid flow, description of flow	10/1/24	4	T1, R2	Smart board , ppt
47	11/1/24	3	continuity equation, Coordinate free form, acceleration of fluid particle	11/1/24	3	T1, R2	Smart board , ppt
48	12/1/24	1	continuity equation, Coordinate free form, acceleration of fluid particle	12/1/24	1	T1, R2	Smart board , ppt
49	16/1/24	3	continuity equation, Coordinate free form, acceleration of fluid particle	16/1/24	3	T1, R2	Smart board , ppt
50	17/1/24	4	rotational & irrotational flow, equation in velocity potential	17/1/24	4	T1, R2	Smart board , ppt
51	18/1/24	4	rotational & irrotational flow, equation in velocity potential	18/1/24	4	T1, R2	Smart board , ppt
52	19/1/24	3	Poisson's equation in stream function, flownet.	19/1/24	3	T1, R2	Smart board , ppt
53	22/1/24	1	Fluid Dynamics; Introduction. Forces acting on fluid in motion. Euler's equation of motion along a streamline	22/1/24	1	T1, R2	Smart board , ppt
54	23/1/24	3	Fluid Dynamics; Introduction. Forces acting on fluid in motion. Euler's equation of motion along a streamline	23/1/24	3	T1, R2	Smart board , ppt
55	24/1/24	4	Integration of Euler's equation to obtain Bernoulli's equation	24/1/24	4	T1, R2	Smart board , ppt
56	25/1/24	4	Integration of Euler's equation to obtain Bernoulli's equation	25/1/24	4	T1, R2	Smart board , ppt
57	29/1/24	3	Assumptions and limitations of Bernoulli's equation. Major head	29/1/24	3	T1, R2	Smart board , ppt

			loss				
58	30/1/24	1	Introduction to Navier-Stokes equation. Application of Bernoulli's theorem	30/1/24	1	T1, R2	Smart board , ppt
59	31/1/24	3	Introduction to Navier-Stokes equation. Application of Bernoulli's theorem	31/1/24	3	T1, R2	Smart board , ppt
60	1/2/24	4	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube.	1/2/24	4	T1, R2	Smart board , ppt
61	2/2/24	4	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube.	2/2/24	4	T1, R2	Smart board , ppt
62	5/2/24	3	venturi-meter, orifice meter, rectangular and triangular notch, pitot tube	5/2/24	3	T1, R2	Smart board , ppt
63	6/2/24	1	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube. Problems	6/2/24	1	T1, R2	Smart board , ppt
64	7/2/24	3	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube. Problems	7/2/24	3	T1, R2	Smart board , ppt
65	8/2/24	4	venturi-meter, orifice meter, rectangular and triangular notch, pitot tube Problems	8/2/24	4	T1, R2	Smart board , ppt
66	9/2/24	4	Revision	9/2/24	4	T1, R2	Smart board , ppt
67	12/2/24	<b>CIE 2</b>					
68	13/2/24						
69	14/2/24						
70	15/2/24						
71	16/2/24	3	Revision	16/2/24	3	T1, R2	Smart board , ppt
72	19/2/24	1	Revision	19/2/24	1	T1, R2	Smart board , ppt
73	20/2/24	3	Revision	20/2/24	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	21/12/2023
2	SEMINAR	8/2/2024

**Text Books:**

1. Mechanics of Materials Ferdinand Beer & Russell Johnston 2003.

**Reference Book:**

1. Mechanics of Materials Ferdinand Beer & Russell Johnston 2003.



**Faculty**



**Prof. & HOD**  
**Department of Mechatronics**  
**The Oxford College Of Engineering**  
 Hebbal, Bangalore - 560 076

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 25/11/23 to 9/3/24**

**SUB.CODE & Name: MSST 21MT53**

**Year/Sem/Section: 3<sup>RD</sup> / V**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Demonstrate the working methodology of smart materials, Microsystems, electronic circuitry in MEMS devices.

CLO2. Illustrate the process of silicon wafer preparation, thin film deposition techniques, lithography, etching, bulk & surface micromachining involved in MEMS fabrication.

CLO3. Examine the behaviour of piezoresistive & piezoelectric materials required to fabricate pressure sensor & vibration control structures.

CLO4. Measure the performance of pressure sensor & vibration control structure in real time applications.

CLO5: Analyze the behaviour of smart materials for different parameters to has sensor and an actuator.

**COURSE OUTCOMES:**

<b>CO1</b>	Understand the operation and Importance of Micro and Smart Systems.
<b>CO2</b>	Understand the Working Principle and Operation of Various Kinds of Sensors and Actuators.
<b>CO3</b>	Understand the Fabrication Process of Micromachining.
<b>CO4</b>	Understand the operation of Electronics Circuits for Micro and Smart Systems.
<b>CO5</b>	Understand the Working Principle of Controllers for MEMS and BEL Pressure Sensor and Smart Structure in vibration control.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	27/11/23	1	introduction to Micro and Smart systems	27/11/23	1	T1, R2	Smart board , ppt
2.	28/11/23	5	Miniaturization,	28/11/23	5	T1, R2	Smart board , ppt
3.	29/11/23	2	Microsystems versus MEMS	29/11/23	2	T1, R2	Smart board , ppt
4.	1/12/23	2	Microsystems versus MEMS	1/12/23	2	T1, R2	Smart board , ppt
5.	4/12/23	4	Micro-fabrication	4/12/23	4	T1, R2	Smart board , ppt
6.	5/12/23	1	Micro-fabrication	5/12/23	1	T1, R2	Smart board , ppt
7.	6/12/23	5	Smart Materials	6/12/23	5	T1, R2	Smart board , ppt
8.	8/12/23	2	Structures & Systems	8/12/23	2	T1, R2	Smart board , ppt
9.	9/12/23	2	Structures & Systems	9/12/23	2	T1, R2	Smart board , ppt
10	11/12/23	4	Integrated Microsystems	11/12/23	4	T1, R2	Smart board , ppt
11	12/12/23	1	Application of Smart Materials & Microsystems	12/12/23	1	T1, R2	Smart board , ppt
12	13/12/23	5	Application of Smart Materials & Microsystems	13/12/23	5	T1, R2	Smart board , ppt
13	15/12/23	2	Application of Smart Materials & Microsystems	15/12/23	2	T1, R2	Smart board , ppt
14	18/12/23	2	Micro and Smart Devices and Systems	18/12/23	2	T1, R2	Smart board , ppt
15	19/12/23	4	Principles and Materials: Definitions and salient features of sensors	19/12/23	4	T1, R2	Smart board , ppt
16	20/12/23	1	actuators, and systems	20/12/23	1	T1, R2	Smart board , ppt
17	22/12/23	5	Sensors: silicon capacitive accelerometer	22/12/23	5	T1, R2	Smart board , ppt
18	23/12/23	2	Piezoresistive pressure sensor	23/12/23	2	T1, R2	Smart board , ppt
19	25/12/23	2	Portable blood analyzer	25/12/23	2	T1, R2	Smart board , ppt
20	27/12/23	4	Conduct metric gas sensor	27/12/23	4	T1, R2	Smart board , ppt
21	28/12/23	<b>CIE 1</b>					
22	29/12/23						

23	30/12/23	<b>CIE 1</b>					
24	1/1/24	1	Actuators: Micro mirror Array for Video Projection	1/1/24	1	T1, R2	Smart board , ppt
25	2/1/24	5	Piezo-electric based inkjet print head,	2/1/24	5	T1, R2	Smart board , ppt
26	3/1/24	2	electrostatic comb-drive	3/1/24	2	T1, R2	Smart board , ppt
27	5/1/24	2	Magnetic micro relay	5/1/24	2	T1, R2	Smart board , ppt
28	8/1/24	4	Micromachining Technologies	8/1/24	4	T1, R2	Smart board , ppt
29	9/1/24	1	Silicon as a Material for Micromachining	9/1/24	1	T1, R2	Smart board , ppt
30	10/1/24	5	Silicon wafer preparation	10/1/24	5	T1, R2	Smart board , ppt
31	12/1/24	2	thin-film deposition techniques,	12/1/24	2	T1, R2	Smart board , ppt
32	13/1/24	2	thin-film deposition techniques,	13/1/24	2	T1, R2	Smart board , ppt
33	16/1/24	4	Lithography,	16/1/24	4	T1, R2	Smart board , ppt
34	17/1/24	1	Etching, Silicon micromachining	17/1/24	1	T1, R2	Smart board , ppt
35	19/1/24	5	surface micromachining bulk micromachining.	19/1/24	5	T1, R2	Smart board , ppt
36	22/1/24	2	Specialized Materials for Microsystems.	22/1/24	2	T1, R2	Smart board , ppt
37	23/1/24	2	Electronics Circuits for Micro and Smart Systems	23/1/24	2	T1, R2	Smart board , ppt
38	24/1/24	4	Semiconductor devices	24/1/24	4	T1, R2	Smart board , ppt
39	27/1/24	1	Diode, Schottky diode	27/1/24	1	T1, R2	Smart board , ppt
40	29/1/24	<b>CIE 2</b>					
41	30/1/24						
42	31/1/24						
43	2/2/24	5	Tunnel diode	2/2/24	5	T1, R2	Smart board , ppt
44	5/2/24	2	Bipolar Junction Transistor (BJT),	5/2/24	2	T1, R2	Smart board , ppt
45	6/2/24	2	MOSFET, and CMOS circuits	6/2/24	2	T1, R2	Smart board , ppt
46	7/2/24	4	Inverter and NAND Gate	7/2/24	4	T1, R2	Smart board , ppt
47	9/2/24	1	Electronics Amplifiers: Operational Amplifiers	9/2/24	1	T1, R2	Smart board , ppt
48	10/2/24	5	Basic Op-Amp circuit, Op-Amp based circuits.	10/2/24	5	T1, R2	Smart board , ppt

49	12/2/24	2	Implementation of Controllers for MEMS & Case Studies of Integrated Microsystems.	12/2/24	2	T1, R2	Smart board , ppt
50	13/2/24	2	Design Methodology, PID controller	13/2/24	2	T1, R2	Smart board , ppt
51	14/2/24	4	Circuit Implementation	14/2/24	4	T1, R2	Smart board , ppt
52	16/2/24	1	Digital controller, Microcontroller & PLC.	16/2/24	1	T1, R2	Smart board , ppt
53	19/2/24	5	Case Studies of Integrated Microsystems:	19/2/24	5	T1, R2	Smart board , ppt
54	20/2/24	2	BEL pressure sensor	20/2/24	2	T1, R2	Smart board , ppt
55	21/2/24	2	design considerations, performance parameters	21/2/24	2	T1, R2	Smart board , ppt
56	23/2/24	4	design considerations, performance parameters	23/2/24	4	T1, R2	Smart board , ppt
57	26/2/24	1	Smart Structure in vibration control.	26/2/24	1	T1, R2	Smart board , ppt
58	27/2/24	5	Smart Structure in vibration control.	27/2/24	5	T1, R2	Smart board , ppt
59	1/3/24	2	Revision	1/3/24	2	T1, R2	Smart board , ppt
60	4/3/24	<b>CIE 3</b>					
61	5/3/24						
62	6/3/24						

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	27/1/2024
2	SEMINAR	26/2/2024

**Text Books:**

1. Micro and Smart Systems V.K.Aatre,Wiley India.

**Reference Book:**

1. Design and Development Methodologies, Smart Material Systems and MEMS V. Varadan, K. J. Vinoy, Goplakrishnan, Wiley.



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hebbaliahalli, Bangalore - 560 066





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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Ms. SEEMA V**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: POWER ELECTRONICS (21MT641)**

**Year/Sem/Section: 3<sup>RD</sup> / VI**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To study and understand the importance of power electronics circuits and their applications.

CLO2. To understand the construction, working, and switching characteristics of various power devices

CLO3. Learn the applications of power devices in AC voltage regulators, controlled rectifiers, choppers and Inverters.

CLO4. Analyze their working under various load conditions

CLO5 To familiarize with the performance parameters of controlled rectifiers, chopper and inverters.

**COURSE OUTCOMES:**

<b>CO1</b>	Have knowledge of semiconductor devices, Thyristors, AC voltage controllers, choppers and inverters.
<b>CO2</b>	. Understand the characteristics and working principles of Thyristors, AC voltage controllers, choppers and inverters
<b>CO3</b>	. Apply control techniques to meet the desired operation of AC voltage regulators, rectifiers and commutation
<b>CO4</b>	Apply control techniques to meet the desired operation of coppers.
<b>CO5</b>	Apply control techniques to meet the desired operation of Inverters

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/4/2024	1	Introduction, Power semiconductor Devices	29/4/2024	1	T1, R2	Smart board , ppt
2.	30/4/2024	3	Applications of Power Electronics,	30/4/2024	3	T1, R2	Smart board , ppt
3.	2/5/2024	3	Applications of Power	2/5/2024	3	T1, R2	Smart

			Electronics,				board , ppt
4.	6/5/2024	1	Power semiconductor devices	6/5/2024	1	T1, R2	Smart board , ppt
5.	7/5/2024	1	Control Characteristics, Types of power electronics circuits	7/5/2024	1	T1, R2	Smart board , ppt
6.	9/5/2024	3	Peripheral effects. Power MOSFETs – switching characteristics, gate drive,	9/5/2024	3	T1, R2	Smart board , ppt
7.	11/5/2024	3	Peripheral effects. Power MOSFETs – switching characteristics, gate drive,	11/5/2024	3	T1, R2	Smart board , ppt
8.	13/5/2024	1	IGBTs, di/dt and dv/dt limitations,	13/5/2024	1	T1, R2	Smart board , ppt
9.	14/5/2024	1	IGBTs, di/dt and dv/dt limitations,	14/5/2024	1	T1, R2	Smart board , ppt
10.	16/5/2024	3	Isolation of gate and base drives	16/5/2024	3	T1, R2	Smart board , ppt
11.	17/5/2024	3	Isolation of gate and base drives	17/5/2024	3	T1, R2	Smart board , ppt
12.	20/5/2024	1	Simple design of gate and base drives.	20/5/2024	1	T1, R2	Smart board , ppt
13.	21/5/2024	1	Simple design of gate and base drives.	21/5/2024	1	T1, R2	Smart board , ppt
14.	23/5/2024	3	Simple design of gate and base drives.	23/5/2024	3	T1, R2	Smart board , ppt
15.	24/5/2024	3	Introduction to Thyristors	24/5/2024	3	T1, R2	Smart board , ppt
16.	27/5/2024	1	characteristics, Two Transistor Model Turn-on and turn-off,	27/5/2024	1	T1, R2	Smart board , ppt
17.	28/5/2024	1	di/dt and dv/dt protection thyristor types, Thyristors firing circuits,	28/5/2024	1	T1, R2	Smart board , ppt
18.	30/5/2024	3	di/dt and dv/dt protection thyristor types, Thyristors firing circuits,	30/5/2024	3	T1, R2	Smart board , ppt
19.	31/5/2024	3	Simple design of firing circuits using UJT.	31/5/2024	3	T1, R2	Smart board , ppt
20.	3/6/2024	<b>CIE 1</b>					
21.	4/6/2024						
22.	5/6/2024						
23.	6/6/2024	1	Introduction. Natural Communication	6/6/2024	1	T1, R2	Smart board , ppt
24.	7/6/2024	1	Forced commutation: self-commutation, impulse commutation	7/6/2024	1	T1, R2	Smart board , ppt
25.	10/6/2024	3	resonant pulse commutation and complementary commutations	10/6/2024	3	T1, R2	Smart board , ppt

26	11/6/2024	3	AC Voltage Controllers: Introduction	11/6/2024	3	T1, R2	Smart board , ppt
27	13/6/2024	1	Principle of ON-OFF and phase control.	13/6/2024	1	T1, R2	Smart board , ppt
28	14/6/2024	1	Single-phase bidirectional controllers with resistive and inductive loads. Controlled	14/6/2024	1	T1, R2	Smart board , ppt
29	18/6/2024	3	Single-phase bidirectional controllers with resistive and inductive loads. Controlled	18/6/2024	3	T1, R2	Smart board , ppt
30	20/6/2024	3	Single-phase bidirectional controllers with resistive and inductive loads. Controlled	20/6/2024	3	T1, R2	Smart board , ppt
31	21/6/2024	1	Introduction. Principle of phase controlled converter operation	21/6/2024	1	T1, R2	Smart board , ppt
32	24/6/2024	1	Single phase semi- converters. Full converters	24/6/2024	1	T1, R2	Smart board , ppt
33	25/6/2024	3	Three-phase half-wave converters. Three-phase full-wave converters.	25/6/2024	3	T1, R2	Smart board , ppt
34	27/6/2024	3	DC Choppers: Introduction.	27/6/2024	3	T1, R2	Smart board , ppt
35	28/6/2024	1	Principle of step-down and step-up chopper with R-L load.	28/6/2024	1	T1, R2	Smart board , ppt
36	29/6/2024	1	Principle of step-down and step-up chopper with R-L load.	29/6/2024	1	T1, R2	Smart board , ppt
37	1/7/2024	3	Principle of step-down and step-up chopper with R-L load.	1/7/2024	3	T1, R2	Smart board , ppt
38	2/7/2024	3	Performance parameters. Choppers classification	2/7/2024	3	T1, R2	Smart board , ppt
39	3/7/2024	<b>CIE 2</b>					
40	4/7/2024						
41	5/7/2024						
42	8/7/2024	1	Performance parameters. Choppers classification	8/7/2024	1	T1, R2	Smart board , ppt
43	9/7/2024	1	Performance parameters. Choppers classification	9/7/2024	1	T1, R2	Smart board , ppt
44	11/7/2024	3	Analysis, of impulse commutated thyristor chopper	11/7/2024	3	T1, R2	Smart board , ppt
45	12/7/2024	3	Analysis, of impulse commutated thyristor chopper	12/7/2024	3	T1, R2	Smart board , ppt
46	13/7/2024	1	Analysis, of impulse commutated thyristor chopper	13/7/2024	1	T1, R2	Smart board , ppt

47	15/7/2024	1	Inverters: Introduction	15/7/2024	1	T1, R2	Smart board , ppt
48	16/7/2024	3	Principle of operation	16/7/2024	3	T1, R2	Smart board , ppt
49	18/7/2024	3	Performance parameters.	18/7/2024	3	T1, R2	Smart board , ppt
50	19/7/2024	1	Single-phase bridge inverters. Three phase inverters.	19/7/2024	1	T1, R2	Smart board , ppt
51	22/7/2024	1	Single-phase bridge inverters. Three phase inverters.	22/7/2024	1	T1, R2	Smart board , ppt
52	23/7/2024	3	Single-phase bridge inverters. Three phase inverters.	23/7/2024	3	T1, R2	Smart board , ppt
53	25/7/2024	<b>CIE 3</b>					
54	26/7/2024						
55	27/7/2024						
56	29/7/2024	3	multiple pulse width, and sinusoidal pulse width modulation.	29/7/2024	3	T1, R2	Smart board , ppt
57	30/7/2024	1	multiple pulse width, and sinusoidal pulse width modulation.	30/7/2024	1	T1, R2	Smart board , ppt
58	31/7/2024	1	multiple pulse width, and sinusoidal pulse width modulation.	31/7/2024	1	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
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1	CCE-1 from the above list	7/6/2024
2	CCE-2 from the above list	23/7/2024

**Text Books:**

1. Power electronics”, m h. Rashid 2nd edition, p. H.i/pearson, new delhi, 2002.

**Reference Book:**

1. Power Electronics – converters, Application and Design”, Net Mohan, Tore M.



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Bhuvanahalli, Bangalore - 560 005

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Bommanahalli, Hosur Road, Bangalore –560068.

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**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Ms. SEEMA V**

**Academic Year: 15/11/23 to 20/2/23**

**SUB.CODE & Name: PYTHON PROGRAMMING 22BMT306C**

**Year/Sem/Section: 2<sup>ND</sup> / 3<sup>RD</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Learn how to handle loops and creation of functions.

CLO2. How to identify methods to create lists, tuple.

CLO3. Develop programs for strings and file organization.

CLO4. Learn concepts of oops programming.

CLO5: Learn concepts of web development.

**COURSE OUTCOMES:**

<b>CO1</b>	Learn the syntax and semantics of the Python programming language.
<b>CO2</b>	<b>Illustrate the process of structuring the data using lists, tuples</b>
<b>CO3</b>	Appraise the need for working with various documents like Excel, PDF, Word and Others.
<b>CO4</b>	Demonstrate the use of built-in functions to navigate the file system.
<b>CO5</b>	Implement the Object Oriented Programming concepts in Python.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11/23	3	Python Basics , Entering Expression into the Interactive Shell, The Integer, Floating-Point, and String Data Type	15/11/23	3	T1, R2	Smart board , ppt
2.	15/11/23	2	String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program	15/11/23	2	T1, R2	Smart board , ppt
3.	17/11/23	4	Flow control, Boolean Values, Comparison Operators, Boolean Operators,	17/11/23	4	T1, R2	Smart board , ppt
4.	17/11/23	1	Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution,	17/11/23	1	T1, R2	Smart board , ppt
5.	20/11/23	3	Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit()	20/11/23	3	T1, R2	Smart board , ppt
6.	20/11/23	2	Functions, def Statements with Parameters, Return Values and return Statements,	20/11/23	2	T1, R2	Smart board , ppt
7.	21/11/23	4	The None Value, Keyword Arguments and print(), Local and Global Scope,	21/11/23	4	T1, R2	Smart board , ppt
8.	23/11/23	1	The global Statement, Exception Handling, A Short Program: Guess the Number	23/11/23	1	T1, R2	Smart board , ppt
9.	23/11/23	3	Lists, The List Data Type, Working with Lists, Augmented Assignment Operators.	23/11/23	3	T1, R2	Smart board , ppt
10	23/11/23	2	Lists, The List Data Type, Working with Lists, Augmented Assignment Operators.	23/11/23	2	T1, R2	Smart board , ppt
11	24/11/23	4	Methods Example Program: Magic 8 Ball with a List,	24/11/23	4	T1, R2	Smart board , ppt
12	24/11/23	1	Methods Example Program: Magic	24/11/23	1	T1, R2	Smart

			8 Ball with a List,				board , ppt
13	27/11/23	3	Methods Example Program: Magic 8 Ball with a List,	27/11/23	3	T1, R2	Smart board , ppt
14	28/11/23	2	List-like Types: Strings and Tuples, References,	28/11/23	2	T1, R2	Smart board , ppt
15	1/12/23	4	Dictionaries and Structuring Data, The Dictionary Data Type,	1/12/23	4	T1, R2	Smart board , ppt
16	1/12/23	1	Dictionaries and Structuring Data, The Dictionary Data Type,	1/12/23	1	T1, R2	Smart board , ppt
17	4/12/23	3	Manipulating Strings, Working with Strings, Useful String Methods	4/12/23	3	T1, R2	Smart board , ppt
18	4/12/23	2	Project: Password Locker,	4/12/23	2	T1, R2	Smart board , ppt
19	5/12/23	4	Project: Adding Bullets to Wiki Markup	5/12/23	4	T1, R2	Smart board , ppt
20	5/12/23	1	Reading and Writing Files:Files and File Path,The os.path Module.	5/12/23	1	T1, R2	Smart board , ppt
21	7/12/23	3	The File Reading/Writing Process, Saving Variables with the shelve Module,	7/12/23	3	T1, R2	Smart board , ppt
22	7/12/23	2	The File Reading/Writing Process, Saving Variables with the shelve Module,	7/12/23	2	T1, R2	Smart board , ppt
23	8/12/23	4	Saving Variables with print.format() Function,	8/12/23	4	T1, R2	Smart board , ppt
24	8/12/23	1	Generating Random Quiz Files, Project: Multi -Clipboard	8/12/23	1	T1, R2	Smart board , ppt
25	11/12/23	3	Organizing Files, The shutil Module,	11/12/23	3	T1, R2	Smart board , ppt
26	11/12/23	2	Walking a Directory Tree	11/12/23	2	T1, R2	Smart board , ppt
27	14/12/23	4	Compressing Files with zipfile Module	14/12/23	4	T1, R2	Smart board , ppt
28	15/12/23	1	Project: Renaming Files with American-Style Dates to European-Style Dates.	15/12/23	1	T1, R2	Smart board , ppt
29	18/12/23	3	Project: Backing Up a Folder into a ZIP File,	18/12/23	3	T1, R2	Smart board , ppt

30	19/12/23	2	Project: Backing Up a Folder into a ZIP File,	19/12/23	2	T1, R2	Smart board , ppt
31	21/12/23	4	Project: Backing Up a Folder into a ZIP File,	21/12/23	4	T1, R2	Smart board , ppt
32	22/12/23	1	Project: Backing Up a Folder into a ZIP File,	22/12/23	1	T1, R2	Smart board , ppt
33	25/12/23	<b>CIE 1</b>					
34	26/12/23						
35	27/12/23						
36	28/12/23						
37	1/1/24	3	Project: Backing Up a Folder into a ZIP File,	1/1/24	3	T1, R2	Smart board , ppt
38	2/1/24	2	Debugging, Raising Exceptions	2/1/24	2	T1, R2	Smart board , ppt
39	4/1/24	4	Debugging, Raising Exceptions	4/1/24	4	T1, R2	Smart board , ppt
40	5/1/24	1	Debugging, Raising Exceptions	5/1/24	1	T1, R2	Smart board , ppt
41	8/1/24	3	Getting the Traceback as a String.	8/1/24	3	T1, R2	Smart board , ppt
42	9/1/24	2	Getting the Traceback as a String.	9/1/24	2	T1, R2	Smart board , ppt
43	11/1/24	4	Getting the Traceback as a String.	11/1/24	4	T1, R2	Smart board , ppt
44	12/1/24	1	Assertions, Logging, IDLE's Debugger.	12/1/24	1	T1, R2	Smart board , ppt
45	16/1/24	3	Assertions, Logging, IDLE's Debugger.	16/1/24	3	T1, R2	Smart board , ppt
46	18/1/24	2	Assertions, Logging, IDLE's Debugger.	18/1/24	2	T1, R2	Smart board , ppt
47	19/1/24	4	Classes and objects, Programmer-defined types, Attributes,	19/1/24	4	T1, R2	Smart board , ppt
48	22/1/24	1	Classes and objects, Programmer-defined types, Attributes,	22/1/24	1	T1, R2	Smart board , ppt
49	23/1/24	3	Classes and objects, Programmer-defined types, Attributes,	23/1/24	3	T1, R2	Smart board , ppt
50	25/1/24	2	Rectangles, Instances as return values, Objects are mutable, Copying	25/1/24	2	T1, R2	Smart board , ppt

51	29/1/24	4	Classes and functions, Time, Pure functions, Modifiers	29/1/24	4	T1, R2	Smart board , ppt
52	30/1/24	1	Prototyping versus planning	30/1/24	1	T1, R2	Smart board , ppt
53	1/2/24	3	Classes and methods, Object-oriented features, Printing objects,	1/2/24	3	T1, R2	Smart board , ppt
54	2/2/24	2	Another example, A more complicated example, The init method,	2/2/24	2	T1, R2	Smart board , ppt
55	5/2/24	4	The __str__ method, Operator overloading, Type-based dispatch	5/2/24	4	T1, R2	Smart board , ppt
56	6/2/24	1	The __str__ method, Operator overloading, Type-based dispatch	6/2/24	1	T1, R2	Smart board , ppt
57	8/2/24	3	REVISION	8/2/24	3	T1, R2	Smart board , ppt
58	9/2/24	2	REVISION	9/2/24	2		
59	12/2/24	<b>CIE 2</b>					
60	13/2/24						
61	14/2/24						
62	15/2/24						

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity



<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	23/12/2023
2	SEMINAR	6/2/2024

**Text Books:**

1. PYTHON FOR BEGINEERS McGRAW HILL 2011

**Reference Book:**

1. PYTHON FOR BEGINEERS McGRAW HILL 2011



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hebbalahalli, Bangalore - 560 066

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FORM 2

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1<sup>st</sup> Phase JP Nagar, Bengaluru – 560 078

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name:** Dr.Manjula C

**Academic Year:** NOV 2023 - MARCH 2024

**SUB.CODE & Name:** RESEARCH METHODOLOGY & INTELLECTUAL PROPERTY RIGHTS

**Year/Sem/Section:** 3<sup>RD</sup> / V

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To know the meaning of engineering research.

CLO2. To know the procedure of Literature Review and Technical Reading.

CLO3. To know the fundamentals of patent laws and drafting procedure.

CLO4. Understanding the copyright laws and subject matters of copyrights and designs.

CLO5. Understanding the basic principles of design rights.

**COURSE OUTCOMES:**

<b>CO1</b>	To Understand the knowledge on basics of research and its types
<b>CO2</b>	To Learn the concept of Literature Review, Technical Reading, Attributions and Citations.
<b>CO3</b>	To learn Ethics in Engineering Research.
<b>CO4</b>	To Discuss the concepts of Intellectual Property Rights.
<b>CO5</b>	To Discuss the concepts of Intellectual Property Rights in engineering.

Sl.no	Planned		Topic	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/11/2023	3	Introduction: Meaning of Research, Objectives of Engineering Research	29/11/2023	3	T1, R2	Smart board , ppt
2.	30/11/2023	3	Motivation in Engineering Research, Types of Engineering Research	30/11/2023		T1, R2	Smart board , ppt
3.	01/12/2023	3	Finding and Solving a Worthwhile Problem	01/12/2023	3	T1, R2	Smart board , ppt
4.	06/12/2023	3	Ethics in Engineering Research, Ethics in Engineering Research Practice	06/12/2023	3	T1, R2	Smart board , ppt
5.	07/12/2023	3	Types of Research Misconduct	07/12/2023	3	T1, R2	Smart board , ppt
6.	08/12/2023	3	Ethical Issues Related to Authorship	08/12/2023	3	T1, R2	Smart board , ppt
7.	13/12/2023	3	Literature Review and Technical Reading, New and Existing Knowledge	13/12/2023	3	T1, R2	Smart board , ppt
8.	14/12/2023	3	Analysis and Synthesis of Prior Art Bibliographic Databases, Web of Science, Google and Google Scholar	14/12/2023	3	T1, R2	Smart board , ppt
9.	15/12/2023	3	Effective Search: The Way Forward Introduction to Technical Reading Conceptualizing Research	15/12/2023	3	T1, R2	Smart board , ppt
10.	20/12/2023	3	Critical and Creative Reading, Taking Notes While Reading	20/12/2023	3	T1, R2	Smart board , ppt
11.	21/12/2023	3	Reading Mathematics and Algorithms, Reading a Datasheet.	21/12/2023	3	T1, R2	Smart board , ppt
12.	22/12/2023	3	Revision of VTU Question Papers	22/12/2023	3	T1, R2	Smart board , ppt
13.	27/12/24	3	Class test.	27/12/24	3	T1, R2	Smart board , ppt
14.	<b>Continuous Internal Evaluation – I 28/12/2023, 29/12/2023, 30/12/2023</b>						
15.	04/01/2024	3	Attributions and Citations: Giving Credit Wherever Due, Citations: Functions and Attributes, Impact of Title and Keywords on Citations, Knowledge Flow through Citation	04/01/2024	3	T1, R2	Smart board , ppt
16.	05/01/2024	3	Citing Datasets, Styles for Citations, Acknowledgments and Attributions, What Should Be Acknowledged, Acknowledgments in, Books	05/01/2024	3	T1, R2	Smart board , ppt

			Dissertations, Dedication or Acknowledgments.				
17.	10/01/2024	3	Introduction to Intellectual Property: Role of IP in the Economic and Cultural Development of the Society, IP Governance	10/01/2024	3	T1, R2	Smart board , ppt
18.	11/01/2024	3	IP as a Global Indicator of Innovation, Origin of IP History of IP in India. Major Amendments in IP Laws and Acts in India	11/01/2024	3	T1, R2	Smart board , ppt
19.	11/01/2024	3	Patents: Conditions for Obtaining a Patent Protection, To Patent or Not to Patent an Invention. Rights Associated with Patents. Enforcement of Patent Rights. Inventions Eligible for Patenting	11/01/2024	3	T1, R2	Smart board , ppt
20.	12/01/2024	3	Non-Patentable Matters. Patent Infringements. Avoid Public Disclosure of an Invention before Patenting. Process of Patenting. Prior Art Search. Choice of Application to be Filed. Patent Application Forms. Jurisdiction of Filing Patent Application. Publication. Pre-grant Opposition. Examination. Grant of a Patent.	12/01/2024	3	T1, R2	Smart board , ppt
21.	17/01/2024	3	Validity of Patent Protection. Post-grant Opposition. Commercialization of a Patent. Need for a Patent Attorney/Agent. Can a Worldwide Patent be Obtained. Do I Need First to File a Patent in India. Patent Related Forms. Fee Structure. Types of Patent Applications. Commonly Used Terms in Patenting. National Bodies Dealing with Patent Affairs. Utility Models	17/01/2024	3	T1, R2	Smart board , ppt
22.	18/01/2024	3	Process of Patenting. Prior Art Search. Choice of Application to be Filed. Patent Application Forms. Jurisdiction of Filing Patent Application. Publication. Pre-grant Opposition. Examination. Grant of a Patent. Validity of Patent Protection. Post-grant Opposition.	18/01/2024	3	T1, R2	Smart board , ppt
23.	19/01/2024	3	Commercialization of a Patent. Need for a Patent Attorney/Agent. Can a Worldwide Patent be Obtained. Do I Need First to File a Patent in India. Patent Related Forms. Fee Structure. Types of Patent Applications. Commonly Used Terms in Patenting. National Bodies Dealing with Patent Affairs. Utility Models.	19/01/2024	3	T1, R2	Smart board , ppt
24.	24/01/2024	3	Revision	24/01/2024	3	T1, R2	Smart board , ppt

25.	25/01/2024		Class Test			T1, R2	Smart board , ppt
26.	<b>Continuous Internal Evaluation – II 29/01/2024, 30/01/2024, 31/01/2024</b>						
27.	01/02/2024	3	Copyrights and Related Rights: Classes of Copyrights. Criteria for Copyright. Ownership of Copyright. Copyrights of the Author. Copyright Infringements. Copyright Infringement is a Criminal Offence. Copyright Infringement is a Cognizable Offence. Fair Use Doctrine. Copyrights and Internet. Non-Copyright Work. Copyright Registration.	01/02/2024	3	T1, R2	Smart board , ppt
28.	02/02/2024	3	Judicial Powers of the Registrar of Copyrights. Fee Structure. Copyright Symbol. Validity of Copyright. Copyright Profile of India. Copyright and the word 'Publish'. Transfer of Copyrights to a Publisher. Copyrights and the Word 'Adaptation'	02/02/2024	3	T1, R2	Smart board , ppt
29.	07/02/2024	3	Copyrights and the Word 'Indian Work'. Joint Authorship. Copyright Society. Copyright Board. Copyright Enforcement Advisory Council (CEAC). International Copyright Agreements, Conventions and Treaties. Interesting Copyrights Cases	07/02/2024	3	T1, R2	Smart board , ppt
30.	08/02/2024	3	Trademarks: Eligibility Criteria. Who Can Apply for a Trademark. Acts and Laws. Designation of Trademark Symbols. Classification of Trademarks. Registration of a Trademark is Not Compulsory. Validity of Trademark.	08/02/2024	3	T1, R2	Smart board , ppt
31.	09/02/2024	3	Types of Trademark Registered in India. Trademark Registry. Process for Trademarks Registration. Prior Art Search. Famous Case Law: Coca-Cola Company vs. Bisleri International Pvt. Ltd.	09/02/2024	3	T1, R2	Smart board , ppt
32.	14/02/2024	3	Industrial Designs: Eligibility Criteria. Acts and Laws to Govern Industrial Designs. Design Rights. Enforcement of Design Rights. Non-Protectable Industrial Designs India.	14/02/2024	3	T1, R2	Smart board , ppt
33.	15/02/2024	3	Protection Term. Procedure for Registration of Industrial Designs. Prior Art Search. Application for Registration. Duration of the Registration of a Design.	15/02/2024	3		
34.	16/02/2024	3	Importance of Design Registration. Cancellation of the Registered Design. Application Forms. Classification of Industrial Designs.	16/02/2024	3	T1, R2	Smart board , ppt



35.	21/02/2024	3	Designs Registration Trend in India. International Treaties. Famous Case Law: Apple Inc. vs. Samsung Electronics Co.	21/02/2024	3	T1, R2	Smart board , ppt
36.	22/02/2024	3	Geographical Indications: Acts, Laws and Rules Pertaining to GI. Ownership of GI. Rights Granted to the Holders. Registered GI in India. Identification of Registered GI.	22/02/2024	3	T1, R2	Smart board , ppt
37.	23/02/2024	3	Classes of GI. Non-Registerable GI. Protection of GI. Collective or Certification Marks. Enforcement of GI Rights. Procedure for GI Registration Documents Required for GI Registration. GI Ecosystem in India.	23/02/2024	3	T1, R2	Smart board , ppt
38.	28/02/2024	3	Case Studies on Patents. Case study of Curcuma (Turmeric) Patent, Case study of Neem Patent, Case study of Basmati patent. IP Organizations In India. Schemes and Programmes	28/02/2024	3	T1, R2	Smart board , ppt
39.	29/02/2024	3	Revision	29/02/2024	3	T1, R2	Smart board , ppt
40.	01/03/2024	3	Class Test	01/03/2024	3	T1, R2	Smart board , ppt
41.	<b>Continuous Internal Evaluation – III 04/03/2024, 05/03/2024, 06/03/2024</b>						
42.	07/03/2024	3	VTU Question Papers Discussion	07/03/2024	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	Assignment	7/6/2024
2	Seminar	23/7/2024

**Text Books:**

1. . David V. Thiel “Research Methods for Engineers” Cambridge University Press, 978-1-107-03488- 4.

**Reference Book:**

1. Intellectual Property Rights by N.K.Acharya Asia Law House 6th Edition. ISBN: 978-93-81849-30-9



**Faculty**



**Prof. & HOD**  
 Department of Mechatronics  
 The Oxford College Of Engineering  
 Bellarynagarhalli, Bangalore - 560 006

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 11/9/23 to 6/1/24**

**SUB.CODE & Name: ARTIFICIAL INTELLIGENCE**

**Year/Sem/Section 4<sup>TH</sup> YEAR / 7<sup>TH</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Have Knowledge of Artificial Intelligence, Production Rules, Search Algorithms Learn concepts of web development.

CLO2. Have Knowledge of Expert System & its architectures, Machine Learning.

CLO3. Understand the working methodology of Search Algorithms

CLO4. Understand the working methodology of Expert System & Machine Learning.

**COURSE OUTCOMES:**

<b>C01</b>	To gain Knowledge of Artificial Intelligence, Production Rules
<b>C02</b>	To gain Knowledge of Search algorithms, Expert System & its architectures
<b>C03</b>	To gain Knowledge of Machine Learning.
<b>C04</b>	To understand the working methodology of Search Algorithms
<b>C05</b>	To understand the working methodology of Expert System & Machine Learning.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	2	Artificial Intelligence: Introduction, History of AI	11/9/23	2	T1, R2	Smart board , ppt
2.	13/9/23	1	Importance f AI	13/9/23	1	T1, R2	Smart board , ppt
3.	14/9/23	3	Early Work in AI	14/9/23	3	T1, R2	Smart board , ppt
4.	15/9/23	1	Scope of AI	15/9/23	1	T1, R2	Smart board , ppt
5.	18/9/23	2	AI and Related fields	18/9/23	2	T1, R2	Smart board , ppt
6.	20/9/23	1	AI Techniques	20/9/23	1	T1, R2	Smart board , ppt
7.	21/9/23	3	Alan Turing Machine	21/9/23	3	T1, R2	Smart board , ppt
8.	22/9/23	1	Intelligent Agents	22/9/23	1	T1, R2	Smart board , ppt
9.	25/9/23	2	Space Representation: Defining the Problem	25/9/23	2	T1, R2	Smart board , ppt
10	27/9/23	1	Production Rules for water jug problem	27/9/23	1	T1, R2	Smart board , ppt
11	28/9/23	3	Breadth-First Search Algorithm	28/9/23	3	T1, R2	Smart board , ppt
12	29/9/23	1	Depth-First Search Algorithm	29/9/23	1	T1, R2	Smart board , ppt
13	29/9/23	2	Generate & Test Algorithm	29/9/23	2	T1, R2	Smart board , ppt
14	29/9/23	1	Hill Climbing Algorithms	29/9/23	1	T1, R2	Smart board , ppt
15	2/10/23	3	Simple Hill Climbing Algorithm	2/10/23	3	T1, R2	Smart board , ppt
16	2/10/23	1	Steepest-Ascent Hill Climbing Algorithm	2/10/23	1	T1, R2	Smart board , ppt
17	4/10/23	2	Expert Systems: Introduction	4/10/23	2	T1, R2	Smart board , ppt
18	5/10/23	1	Characteristics of Expert System	5/10/23	1	T1, R2	Smart board , ppt
19	6/10/23	3	Need of an Expert System	6/10/23	3	T1, R2	Smart board , ppt
20	9/10/23	1	Expert System Architecture	9/10/23	1	T1, R2	Smart board , ppt
21	11/10/23	2	Steps to develop an Expert System	11/10/23	2	T1, R2	Smart board , ppt
22	12/9/23	1	case studies: MYCIN	12/9/23	1	T1, R2	Smart board , ppt

23	13/9/23	3	case studies: DENDRAL	13/9/23	3	T1, R2	Smart board , ppt
24	16/9/23	<b>CIE 1</b>					
25	17/9/23						
26	18/9/23						
27	25/10/23						
28	26/10/23	2	<b>TAN-Toy Adaptive Node</b>	26/10/23	2	T1, R2	Smart board , ppt
29	27/10/23	1	Network Structures	27/10/23	1	T1, R2	Smart board , ppt
30	30/10/23	3	Application of Neural Nets	30/10/23	3	T1, R2	Smart board , ppt
31	2/11/23	1	Expert Systems Architectures: Introduction	2/11/23	1	T1, R2	Smart board , ppt
32	3/11/23	2	Rule-Based System Architectures	3/11/23	2	T1, R2	Smart board , ppt
33	6/11/23	1	Non-Production system Architectures	6/11/23	1	T1, R2	Smart board , ppt
34	8/11/23	3	Semantic Network Architectures	8/11/23	3	T1, R2	Smart board , ppt
35	9/11/23	1	Frame Architectures	9/11/23	1	T1, R2	Smart board , ppt
36	10/11/23	2	Decision Tree Architectures	10/11/23	2	T1, R2	Smart board , ppt
37	13/11/23	1	Blackboard System Architectures	13/11/23	1	T1, R2	Smart board , ppt
38	15/11/23	3	Analogical Reasoning Architectures	15/11/23	3	T1, R2	Smart board , ppt
39	16/11/23	1	Neural Network Architectures	16/11/23	1	T1, R2	Smart board , ppt
40	17/11/23	2	Introduction to Machine Learning: Introduction	17/11/23	2	T1, R2	Smart board , ppt
41	20/11/23	<b>CIE 2</b>					
42	21/11/23						
43	22/11/23						
44	27/11/23						
45	29/11/23	3	Perceptron Learning Algorithm	29/11/23	3	T1, R2	Smart board , ppt
46	1/12/23	1	Perceptron Learning Algorithm	1/12/23	1	T1, R2	Smart board , ppt
47	4/12/23	2	Checkers Playing Examples	4/12/23	2	T1, R2	Smart board , ppt
48	6/12/23	1	Checkers Playing Examples	6/12/23	1	T1, R2	Smart board , ppt
49	7/12/23	3	Learning automata: Automaton model	7/12/23	3	T1, R2	Smart board , ppt
50	8/12/23	1	Temperature Control Model	8/12/23	1	T1, R2	Smart



							<b>board , ppt</b>
<b>51</b>	11/12/23	2	CLA representation of NIM game	11/12/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>52</b>	13/12/23	1	CLA representation of NIM game	13/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>53</b>	14/12/23	3	Genetic Algorithms	14/12/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>54</b>	15/12/23	1	Genetic Algorithms	15/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>55</b>	18/12/23	2	Intelligent editors	18/12/23	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>56</b>	20/12/23	1	REVISION	20/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>57</b>	21/12/23	3	REVISION	21/12/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>58</b>	21/12/23	3	REVISION	21/12/23	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>59</b>	27/12/23	<b>CIE 3</b>					
<b>60</b>	28/12/23						
<b>61</b>	28/12/23						

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	12/9/2023

2	ASSIGNMENT	17/11/23
3	ASSIGNMENT	21/12/23

**Text Books:**

1. **Artificial Intelligence** Elaine Rich & Kevin Knight, 2004.

**Reference Book:**

1. **Artificial Intelligence A Practical Approach** Er.Rajiv Chopra, S.Chand & Company Ltd



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
He. Channahalli, Bangalore - 560 005

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### MECHATRONICS ENGINEERING

#### LESSON PLAN

**Faculty Name:** Ms. Seema V

**Academic Year:** 11/9/23 to 6/1/24

**SUB.CODE & Name:** AUTOMATION PROCESS CONTROL

**Year/Sem/Section** 4<sup>TH</sup> YEAR / 7<sup>TH</sup> SEM

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Have a knowledge of Process Control System on various Process Parameter ( P,PI,PID) and Converter.

CLO2. Understanding the concepts of Automation in Process Control Involved in Measurement System.

CLO3. Understanding the concepts of Controller used in Industry.

CLO4. Application of Digital and Analog Controller used in various Automated Application based on Controller Parameters.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Gain knowledge of developing basic skills necessary for importance Process controller
<b>CO2</b>	Analog Controller) Using in Various Industry.
<b>CO3</b>	Understand the concepts and various Operation using Automation Process System
<b>CO4</b>	Understand the concepts of Process Control System.
<b>CO5</b>	Determine and Diagnosis the Principles of Various Digital and Analog Controller and ADC, DAC.

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	11/9/23	1	process control block diagram	11/9/23	1	T1, R2	Smart board , ppt
2.	12/9/23	4	Control system evolution.	12/9/23	4	T1, R2	Smart board , ppt
3.	14/9/23	4	Final control: introduction to final control operation	14/9/23	4	T1, R2	Smart board , ppt
4.	15/9/23	4	signal conversions, actuators, control elements.	15/9/23	4	T1, R2	Smart board , ppt
5.	18/9/23	1	Alarm and annunciators, control drawing	18/9/23	1	T1, R2	Smart board , ppt
6.	19/9/23	4	P & ID symbols and diagrams,	19/9/23	4	T1, R2	Smart board , ppt
7.	21/9/23	4	flow sheet symbols, inter logic symbols, graphic symbols.	21/9/23	4	T1, R2	Smart board , ppt
8.	22/9/23	4	Introduction,	22/9/23	4	T1, R2	Smart board , ppt
9.	25/9/23	1	process characteristics	25/9/23	1	T1, R2	Smart board , ppt
10	26/9/23	4	control system parameters	26/9/23	4	T1, R2	Smart board , ppt
11	29/9/23	4	discontinuous control modes,	29/9/23	4	T1, R2	Smart board , ppt
12	3/10/23	4	Continuous control modes	3/10/23	4	T1, R2	Smart board , ppt
13	5/10/23	1	composite control modes	5/10/23	1	T1, R2	Smart board , ppt
14	6/10/23	4	composite control modes	6/10/23	4	T1, R2	Smart board , ppt
15	9/10/23	4	composite control modes	9/10/23	4	T1, R2	Smart board , ppt
16	10/10/23	4	Introduction, definition	10/10/23	4	T1, R2	Smart board , ppt
17	12/10/23	1	characteristics of discrete state process control	12/10/23	1	T1, R2	Smart board , ppt
18	13/10/23	4	characteristics of discrete state process control	13/10/23	4	T1, R2	Smart board , ppt
19	16/10/23	<b>CIE 1</b>					
20	17/10/23						
21	18/10/23						
22	23/10/23	4	Control-loop characteristics: Introduction	23/10/23	4	T1, R2	Smart board , ppt
23	24/10/23	4	Control-loop characteristics:	24/10/23	4	T1, R2	Smart board , ppt

			Introduction				
24	26/10/23	1	control system configuration	26/10/23	1	T1, R2	Smart board , ppt
25	27/10/23	4	multivariable control systems	27/10/23	4	T1, R2	Smart board , ppt
26	30/10/23	4	control system quality	30/10/23	4	T1, R2	Smart board , ppt
27	31/10/23	4	stability, and process loop tuning	31/10/23	4	T1, R2	Smart board , ppt
28	2/11/23	1	stability, and process loop tuning	2/11/23	1	T1, R2	Smart board , ppt
29	3/11/23	4	Introduction	3/11/23	4	T1, R2	Smart board , ppt
30	6/11/23	4	general features	6/11/23	4	T1, R2	Smart board , ppt
31	7/11/23	4	electronic controllers	7/11/23	4	T1, R2	Smart board , ppt
32	9/11/23	1	electronic controllers	9/11/23	1	T1, R2	Smart board , ppt
33	10/11/23	4	pneumatic controllers	10/11/23	4	T1, R2	Smart board , ppt
34	13/11/23	4	pneumatic controllers	13/11/23	4	T1, R2	Smart board , ppt
35	16/11/23	4	designs considerations	16/11/23	4	T1, R2	Smart board , ppt
36	17/11/23	1	designs considerations	17/11/23	1	T1, R2	Smart board , ppt
37	20/11/23	<b>CIE 2</b>					
38	21/11/23						
39	22/11/23						
40	23/11/23	4	designs considerations	23/11/23	4	T1, R2	Smart board , ppt
41	24/11/23	4	V-F, and F-V converters	24/11/23	4	T1, R2	Smart board , ppt
42	27/11/23	4	V-F, and F-V converters	27/11/23	4	T1, R2	Smart board , ppt
43	28/11/23	1	performance specifications	28/11/23	1	T1, R2	Smart board , ppt
44	1/12/23	4	D-A conversion techniques	1/12/23	4	T1, R2	Smart board , ppt
45	4/12/23	4	(R-2R & binary weighted) multiplying DAC applications.	4/12/23	4	T1, R2	Smart board , ppt
46	5/12/23	4	(R-2R & binary weighted) multiplying DAC applications.	5/12/23	4	T1, R2	Smart board , ppt
47	7/12/23	1	A-D conversion techniques	7/12/23	1	T1, R2	Smart board , ppt
48	8/12/23	4	flash, successive approximation	8/12/23	4	T1, R2	Smart board , ppt
49	11/12/23	4	single slope	11/12/23	4	T1, R2	Smart

							<b>board , ppt</b>
<b>50</b>	12/12/23	4	dual slope	12/12/23	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>51</b>	14/12/23	1	Over sampling converters.	14/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>52</b>	15/12/23	4	Over sampling converters.	15/12/23	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>53</b>	18/12/23	4	Revision	18/12/23	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>54</b>	19/12/23	4	Revision	19/12/23	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>55</b>	21/12/23	1	Revision	21/12/23	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>56</b>	27/12/23	<b>CIE 3</b>					
<b>57</b>	28/12/23						
<b>58</b>	29/12/23						

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	13/10/2023
2	ASSIGNMENT	17/11/23
3	ASSIGNMENT	21/12/23



**Text Books:**

1. Process Control Instrumentation Technology- Tata McGraw Hill. 2012.

**Reference Book:**

1. Process Control Instrumentation Technology- Design with operational amplifiers and analog integrated circuits 2011



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Benchanahalli, Bangalore - 560 006

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**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Dr.Manjula C**

**Academic Year: 15/11/23 to 20/2/23**

**SUB.CODE & Name: COA BMT304**

**Year/Sem/Section:2<sup>ND</sup> / 3<sup>RD</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Explain the basic organization of a computer system.

CLO2. Explain different ways of accessing an input / output device including interrupts

CLO3.

CLO3. Illustrate the organization of different types of semiconductor and other secondary storage memories.

CLO4: Illustrate simple processor organization based on hardwired control and micro programmed control

**COURSE OUTCOMES:**

<b>CO1</b>	Explain the basic sub systems of a computer, their organization, structure and operation.
<b>CO2</b>	Illustrate the concept of programs as sequences of machine instructions.
<b>CO3</b>	Demonstrate different ways of communicating with I/O devices
<b>CO4</b>	Describe memory hierarchy and concept of virtual memory
<b>CO5</b>	Illustrate organization of simple pipelined processor and other computing systems.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11/23	3	Python Basics , Entering Expression into the Interactive Shell, The Integer, Floating-Point, and String Data Type	15/11/23	3	T1, R2	Smart board , ppt
2.	15/11/23	2	String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program	15/11/23	2	T1, R2	Smart board , ppt
3.	16/11/23	2	Flow control, Boolean Values, Comparison Operators, Boolean Operators,	16/11/23	2	T1, R2	Smart board , ppt
4.	16/11/23	2	Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution,	16/11/23	2	T1, R2	Smart board , ppt
5.	17/11/23	3	Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit()	17/11/23	3	T1, R2	Smart board , ppt
6.	17/11/23	2	Functions, def Statements with Parameters, Return Values and return Statements,	17/11/23	2	T1, R2	Smart board , ppt
7.	21/11/23	2	The None Value, Keyword Arguments and print(), Local and Global Scope,	21/11/23	2	T1, R2	Smart board , ppt
8.	22/11/23	2	The global Statement, Exception Handling, A Short Program: Guess the Number	22/11/23	2	T1, R2	Smart board , ppt
9.	22/11/23	3	Lists, The List Data Type, Working with Lists, Augmented Assignment Operators.	22/11/23	3	T1, R2	Smart board , ppt
10	23/11/23	2	Lists, The List Data Type, Working with Lists, Augmented Assignment Operators.	23/11/23	2	T1, R2	Smart board , ppt
11	23/11/23	2	Methods Example Program: Magic 8 Ball with a List,	23/11/23	2	T1, R2	Smart board , ppt
12	24/11/23	2	Methods Example Program: Magic	24/11/23	2	T1, R2	Smart

			8 Ball with a List,				board , ppt
13	24/11/23	3	Methods Example Program: Magic 8 Ball with a List,	24/11/23	3	T1, R2	Smart board , ppt
14	24/11/23	2	List-like Types: Strings and Tuples, References,	24/11/23	2	T1, R2	Smart board , ppt
15	28/11/23	2	Dictionaries and Structuring Data, The Dictionary Data Type,	28/11/23	2	T1, R2	Smart board , ppt
16	28/11/23	2	Dictionaries and Structuring Data, The Dictionary Data Type,	28/11/23	2	T1, R2	Smart board , ppt
17	29/11/23	3	Manipulating Strings, Working with Strings, Useful String Methods	29/11/23	3	T1, R2	Smart board , ppt
18	29/11/23	2	Project: Password Locker,	29/11/23	2	T1, R2	Smart board , ppt
19	1/12/23	2	Project: Adding Bullets to Wiki Markup	1/12/23	2	T1, R2	Smart board , ppt
20	1/12/23	2	Reading and Writing Files:Files and File Path,The os.path Module.	1/12/23	2	T1, R2	Smart board , ppt
21	5/12/23	3	The File Reading/Writing Process, Saving Variables with the shelve Module,	5/12/23	3	T1, R2	Smart board , ppt
22	5/12/23	2	The File Reading/Writing Process, Saving Variables with the shelve Module,	5/12/23	2	T1, R2	Smart board , ppt
23	6/12/23	2	Saving Variables with print.format() Function,	6/12/23	2	T1, R2	Smart board , ppt
24	6/12/23	2	Generating Random Quiz Files, Project: Multi -Clipboard	6/12/23	2	T1, R2	Smart board , ppt
25	7/12/23	3	Organizing Files, The shutil Module,	7/12/23	3	T1, R2	Smart board , ppt
26	7/12/23	2	Walking a Directory Tree	7/12/23	2	T1, R2	Smart board , ppt
27	8/12/23	2	Compressing Files with zipfile Module	8/12/23	2	T1, R2	Smart board , ppt
28	8/12/23	2	Project: Renaming Files with American-Style Dates to European-Style Dates.	8/12/23	2	T1, R2	Smart board , ppt
29	12/12/23	3	Project: Backing Up a Folder into a ZIP File,	12/12/23	3	T1, R2	Smart board , ppt

30	13/12/23	2	Project: Backing Up a Folder into a ZIP File,	13/12/23	2	T1, R2	Smart board , ppt
31	14/12/23	2	Project: Backing Up a Folder into a ZIP File,	14/12/23	2	T1, R2	Smart board , ppt
32	15/12/23	2	Project: Backing Up a Folder into a ZIP File,	15/12/23	2	T1, R2	Smart board , ppt
33	19/12/23	3	Project: Backing Up a Folder into a ZIP File,	19/12/23	3	T1, R2	Smart board , ppt
34	20/12/23	2	Debugging, Raising Exceptions	20/12/23	2	T1, R2	Smart board , ppt
35	21/12/23	2	Debugging, Raising Exceptions	21/12/23	2	T1, R2	Smart board , ppt
36	22/12/23	2	Debugging, Raising Exceptions	22/12/23	2	T1, R2	Smart board , ppt
37	23/12/23	3	Getting the Traceback as a String.	23/12/23	3	T1, R2	Smart board , ppt
38	23/12/23	2	Getting the Traceback as a String.	23/12/23	2	T1, R2	Smart board , ppt
39	23/12/23	2	Getting the Traceback as a String.	23/12/23	2	T1, R2	Smart board , ppt
40	26/12/23	<b>CIE 1</b>					
41	27/12/23						
42	28/12/23						
43	2/1/24	2	Assertions, Logging, IDLE's Debugger.	2/1/24	2	T1, R2	Smart board , ppt
44	2/1/24	3	Assertions, Logging, IDLE's Debugger.	2/1/24	3	T1, R2	Smart board , ppt
45	3/1/24	2	Assertions, Logging, IDLE's Debugger.	3/1/24	2	T1, R2	Smart board , ppt
46	4/1/24	2	Classes and objects, Programmer-defined types, Attributes,	4/1/24	2	T1, R2	Smart board , ppt
47	4/1/24	2	Classes and objects, Programmer-defined types, Attributes,	4/1/24	2	T1, R2	Smart board , ppt
48	5/1/24	3	Classes and objects, Programmer-defined types, Attributes,	5/1/24	3	T1, R2	Smart board , ppt
49	9/1/24	2	Rectangles, Instances as return values, Objects are mutable, Copying	9/1/24	2	T1, R2	Smart board , ppt
50	10/1/24	2	Classes and functions, Time, Pure functions, Modifiers	10/1/24	2	T1, R2	Smart board , ppt

51	11/1/24	2	Prototyping versus planning	11/1/24	2	T1, R2	Smart board , ppt
52	12/1/24	3	Classes and methods, Object-oriented features, Printing objects,	12/1/24	3	T1, R2	Smart board , ppt
53	16/1/24	2	Another example, A more complicated example, The init method,	16/1/24	2	T1, R2	Smart board , ppt
54	17/1/24	2	The __str__ method, Operator overloading, Type-based dispatch	17/1/24	2	T1, R2	Smart board , ppt
55	18/1/24	2	The __str__ method, Operator overloading, Type-based dispatch	18/1/24	2	T1, R2	Smart board , ppt
56	19/1/24	3	REVISION	19/1/24	3	T1, R2	Smart board , ppt
57	23/1/24	2	REVISION	23/1/24	2	T1, R2	Smart board , ppt
58	25/1/24	<b>CIE 2</b>					
59	26/1/24						
60	27/1/24						

### Continuous and Comprehensive Evaluation (CCE)

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity



<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	23/12/2023
2	SEMINAR	23/1/24

**Text Books:**

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky: Computer Organization, 5th Edition, Tata McGraw Hill, 2002.

**Reference Book:**

1. David A. Patterson, John L. Hennessy: Computer Organization and Design – The Hardware /Software Interface ARM Edition, 4th Edition, Elsevier, 2009.



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hebbalahalli, Bangalore - 560 066

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### MECHATRONICS ENGINEERING

#### LESSON PLAN

**Faculty Name: Ms. Seema V**

**Academic Year: 25/11/23 to 9/3/24**

**SUB.CODE & Name: MSST 21MT53**

**Year/Sem/Section: 3<sup>RD</sup> / V**

**COURSE OBJECTIVES** This course will enable the students to

- CLO1. Demonstrate the concepts of control systems and its specifications for mathematical modelling.
- CLO2. Understand the structured LabVIEW programming concepts in developing Virtual Instrumentation.
- CLO3. Understand general purpose interface bus and Serial communication Interface.
- CLO4. Develop the mathematical model for mechanical and electrical systems.
- CLO5: Analyse various applications on Real time monitoring using DAQ boards.

#### **COURSE OUTCOMES:**

<b>CO1</b>	Gain fundamental knowledge of control systems, mathematical modelling of physical system.
<b>CO2</b>	Solve the control system problems using block diagram reduction technique and Mason's gain formula.
<b>CO3</b>	Understand the importance of Virtual Instrumentation and various operation of DAQ devices.
<b>CO4</b>	Identify and analyse the basic programming concepts in Lab View.
<b>CO5</b>	Compare types of I/O module, Data Acquisition System and Communication Networks (Bus Systems) using Standard Protocol, and examine analysis tools.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	27/11/23	1	MODELLING OF SYSTEMS AND BLOCK DIAGRAM	27/11/23	1	T1, R2	Smart board , ppt
2.	28/11/23	3	Introduction to control systems	28/11/23	3	T1, R2	Smart board , ppt
3.	29/11/23	3	types of control systems,	29/11/23	3	T1, R2	Smart board , ppt
4.	1/12/23	2	concept of mathematical modelling of physical systems- mechanical	1/12/23	2	T1, R2	Smart board , ppt
5.	4/12/23	1	concept of mathematical modelling of physical systems- mechanical	4/12/23	1	T1, R2	Smart board , ppt
6.	5/12/23	3	translational (mechanical accelerometer	5/12/23	3	T1, R2	Smart board , ppt
7.	6/12/23	3	systems excluded), and rotational systems	6/12/23	3	T1, R2	Smart board , ppt
8.	8/12/23	2	systems excluded), and rotational systems	8/12/23	2	T1, R2	Smart board , ppt
9.	9/12/23	1	analogous systems based on force voltage analogy and force current analogy	9/12/23	1	T1, R2	Smart board , ppt
10	11/12/23	3	analogous systems based on force voltage analogy and force current analogy	11/12/23	3	T1, R2	Smart board , ppt
11	12/12/23	3	analogous systems based on force voltage analogy and force current analogy	12/12/23	3	T1, R2	Smart board , ppt
12	13/12/23	2	analogous systems based on force voltage analogy and force current analogy	13/12/23	2	T1, R2	Smart board , ppt
13	15/12/23	1	BLOCK DIAGRAM:	15/12/23	1	T1, R2	Smart board , ppt
14	18/12/23	3	Introduction to block	18/12/23	3	T1, R2	Smart board , ppt
15	19/12/23	3	diagram algebra and numerical problems	19/12/23	3	T1, R2	Smart board , ppt
16	20/12/23	2	numerical problems	20/12/23	2	T1, R2	Smart board , ppt
17	22/12/23	1	numerical problems	22/12/23	1	T1, R2	Smart board , ppt
18	23/12/23	3	numerical problems	23/12/23	3	T1, R2	Smart board , ppt
19	25/12/23	3	SIGNAL FLOW GRAPH: Introduction to Signal	25/12/23	3	T1, R2	Smart board , ppt

			Flow graph				
20	27/12/23	2	SIGNAL FLOW GRAPH: Introduction to Signal.	27/12/23	2	T1, R2	Smart board , ppt
21	28/12/23	<b>CIE 1</b>					
22	29/12/23						
23	30/12/23						
24	1/1/24	1	Mason's gain formula	1/1/24	1	T1, R2	Smart board , ppt
25	2/1/24	3	Obtaining Transfer functions for the given SFG using Mason's gain formula.	2/1/24	3	T1, R2	Smart board , ppt
26	3/1/24	3	Obtaining Transfer functions for the given SFG using Mason's gain formula.	3/1/24	3	T1, R2	Smart board , ppt
27	5/1/24	2	Obtaining Transfer functions for the given SFG using Mason's gain formula.	5/1/24	2	T1, R2	Smart board , ppt
28	8/1/24	1	CONCEPT OF VIRTUAL INSTRUMENTATION AND DAQ SYSTEMS	8/1/24	1	T1, R2	Smart board , ppt
29	9/1/24	3	Concepts of Instrumentation and Measurements Historical perspective	9/1/24	3	T1, R2	Smart board , ppt
30	10/1/24	3	Need of VI – Advantages of VI – Define VI	10/1/24	3	T1, R2	Smart board , ppt
31	12/1/24	2	Block diagram & Architecture of VI – Data flow techniques –	12/1/24	2	T1, R2	Smart board , ppt
32	13/1/24	1	Graphical programming in data flow	13/1/24	1	T1, R2	Smart board , ppt
33	16/1/24	3	Comparison with conventional programming.	16/1/24	3	T1, R2	Smart board , ppt
34	17/1/24	3	Comparison with conventional programming.	17/1/24	3	T1, R2	Smart board , ppt
35	19/1/24	2	PC based data acquisition, Signal conditioning functions	19/1/24	2	T1, R2	Smart board , ppt
36	22/1/24	1	calibration, resolution	22/1/24	1	T1, R2	Smart board , ppt
37	23/1/24	3	ADC, DAC, Single-ended and differential inputs,	23/1/24	3	T1, R2	Smart board , ppt
38	24/1/24	3	calibration, resolution	24/1/24	3	T1, R2	Smart board , ppt
39	27/1/24	2	ADC, DAC, Single-ended and differential inputs,	27/1/24	2	T1, R2	Smart board , ppt
40	29/1/24						

41	30/1/24	<b>CIE 2</b>					
42	31/1/24						
43	2/2/24	1	Sampling fundamentals – sampling, sampling theorem	2/2/24	1	T1, R2	Smart board , ppt
44	5/2/24	3	sampling frequency	5/2/24	3	T1, R2	Smart board , ppt
45	6/2/24	3	CONCEPTS OF GRAPHICAL PROGRAMMING:	6/2/24	3	T1, R2	Smart board , ppt
46	7/2/24	2	Lab-view software – Concept of VIs and sub VI	7/2/24	2	T1, R2	Smart board , ppt
47	9/2/24	1	Lab-view software – Concept of VIs and sub VI	9/2/24	1	T1, R2	Smart board , ppt
48	10/2/24	3	Loops (While Loop and For Loop),	10/2/24	3	T1, R2	Smart board , ppt
49	12/2/24	3	Loops (While Loop and For Loop),	12/2/24	3	T1, R2	Smart board , ppt
50	13/2/24	2	Structures (Case, Formula node, and sequence structures)	13/2/24	2	T1, R2	Smart board , ppt
51	14/2/24	1	Structures (Case, Formula node, and sequence structures)	14/2/24	1	T1, R2	Smart board , ppt
52	16/2/24	3	Arrays Operations, Strings Operations	16/2/24	3	T1, R2	Smart board , ppt
53	19/2/24	3	and file I/O. Examples on each.	19/2/24	3	T1, R2	Smart board , ppt
54	20/2/24	2	and file I/O. Examples on each.	20/2/24	2	T1, R2	Smart board , ppt
55	21/2/24	1	INTERFACING OF EXTERNAL INSTRUMENTS TO A PC:	21/2/24	1	T1, R2	Smart board , ppt
56	23/2/24	3	RS232, RS 422, RS 485 and USB standards	23/2/24	3	T1, R2	Smart board , ppt
57	26/2/24	3	RS232, RS 422, RS 485 and USB standards	26/2/24	3	T1, R2	Smart board , ppt
58	27/2/24	2	IEEE 488 standard – ISO-OSI model for serial bus	27/2/24	2	T1, R2	Smart board , ppt
59	1/3/24	1	IEEE 488 standard – ISO-OSI model for serial bus.	1/3/24	1	T1, R2	Smart board , ppt
60	4/3/24	<b>CIE 3</b>					
61	5/3/24						
62	6/3/24						

## Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	ASSIGNMENT	27/1/2024
2	SEMINAR	26/2/2024

### Text Books:

1. "Virtual Instrumentation using LabVIEW" Jovitha Jerome, PHI publication.

### Reference Book:

1. "Control Systems Engineering", I.J. Nagarath and M. Gopal ,New Age International (P) Limited, Publishers, Fifth edition – 2012.



Faculty



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hebbal, Bangalore - 560 066



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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: Hydraulics and Pneumatics (BMT403)**

**Year/Sem/Section: 2<sup>nd</sup> / IV**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To gain basic knowledge of hydraulic and pneumatic systems.

CLO2. To Understanding the working principles of hydraulics and pneumatics components.

CLO3. To Apply the knowledge of hydraulic systems to design hydraulic circuits for different application.

CLO4. To Apply the knowledge of pneumatic systems to design pneumatic circuits for different application.

CLO5: To Design hydraulic and pneumatic circuits with multicylinder applications using solenoid control.

**COURSE OUTCOMES:**

<b>CO1</b>	Understand different components of pneumatic and hydraulic circuits.
<b>CO2</b>	Demonstrate working of valves, solenoids, and pumps.
<b>CO3</b>	Apply concepts of pneumatic and hydraulic to design and develop respective circuits.
<b>CO4</b>	Design and analyse Hydraulic/pneumatic circuits.
<b>CO5</b>	Design pneumatic circuits for various industrial applications using experimental pneumatic kits

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/2024	1	Definition of hydraulic system structure of hydraulic control	22/4/2024	1	T1, R2	Smart board , ppt
2.	23/4/2024	3	system. Structure of Pneumatic control System, fluid conditioners and FRL unit. Pneumatic	23/4/2024	3	T1, R2	Smart board , ppt

3.	25/4/2024	3	advantages, limitations, applications	25/4/2024	3	T1, R2	Smart board , ppt
4.	27/4/2024	4	Pumps, classification of pumps,	27/4/2024	4	T1, R2	Smart board , ppt
5.	29/4/2024	1	pumping theory of positive displacement pumps	29/4/2024	1	T1, R2	Smart board , ppt
6.	30/4/2024	3	construction and working of gear pumps	30/4/2024	3	T1, R2	Smart board , ppt
7.	2/5/2024	3	vane pumps, piston pumps,	2/5/2024	3	T1, R2	Smart board , ppt
8.	3/5/2024	4	fixed and variable displacement pumps	3/5/2024	4	T1, R2	Smart board , ppt
9.	6/5/2024	1	pump performance characteristics	6/5/2024	1	T1, R2	Smart board , ppt
10	7/5/2024	3	pump selection factor, problems on pumps	7/5/2024	3	T1, R2	Smart board , ppt
11	9/5/2024	3	pump selection factor, problems on pumps	9/5/2024	3	T1, R2	Smart board , ppt
12	11/5/2024	4	Classification: cylinder and hydraulic motors, Linear Hydraulic Actuators [cylinders],	11/5/2024	4	T1, R2	Smart board , ppt
13	13/5/2024	1	single and double acting cylinder, Cylinder cushioning,	13/5/2024	1	T1, R2	Smart board , ppt
14	14/5/2024	3	special types of cylinders, problems on cylinders,	14/5/2024	3	T1, R2	Smart board , ppt
15	16/5/2024	3	construction and working of rotary actuators such as gear	16/5/2024	3	T1, R2	Smart board , ppt
16	17/5/2024	4	vane, piston motors, Hydraulic Motor Theoretical Torque,	17/5/2024	4	T1, R2	Smart board , ppt
17	20/5/2024	1	Power and Flow Rate, Hydraulic Motor Performance	20/5/2024	1	T1, R2	Smart board , ppt
18	21/5/2024	3	problems, symbolic representation of hydraulic actuators.	21/5/2024	3	T1, R2	Smart board , ppt
19	23/5/2024	3	Classification of control valves, Directional Control Valves- Symbolic representation	23/5/2024	3	T1, R2	Smart board , ppt
20	24/5/2024	4	constructional features of poppet, sliding spool	24/5/2024	4	T1, R2	Smart board , ppt
21	25/5/2024	1	otary type valves solenoid and pilot operated DCV.	25/5/2024	1	T1, R2	Smart board , ppt
22	27/5/2024	3	shuttle valve, check valves,	27/5/2024	3	T1, R2	Smart board , ppt
23	28/5/2024	3	Pressure control valves - types, direct operated types and pilot operated types.	28/5/2024	3	T1, R2	Smart board , ppt

24	30/5/2024	4	Quick exhaust valve, time delay valve, shuttle valve, twin pressure valve	30/5/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
25	31/5/2024	1	Flow Control Valves - compensated and non-compensated FCV	31/5/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
26	3/6/2024	3	needle valve, temperature compensated	3/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
27	4/6/2024	3	pressure compensated,	4/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
28	6/6/2024	4	pressure and temperature compensated FCV	6/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
29	7/6/2024	1	symbolic representation	7/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
30	8/6/2024	3	Control of Single and Double - Acting Hydraulic Cylinder, Regenerative circuit, Pump Unloading Circuit, Double Pump Hydraulic System	8/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
31	13/6/2024	3	Counter balance Valve Application, Hydraulic Cylinder Sequencing Circuits	13/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
32	14/6/2024	4	Automatic cylinder reciprocating system,	14/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
33	18/6/2024	1	Locked Cylinder using Pilot check Valve, Cylinder synchronizing circuit using different methods, factors affecting synchronization,	18/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
34	20/6/2024	3	Speed Control of Hydraulic Cylinder, Speed Control of Hydraulic Motors, Safety circuit, Accumulators, types, construction and applications with circuits.	20/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
35	21/6/2024	3	General type of Fluids, Sealing Devices,	21/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
36	24/6/2024	4	Use of Logic gates - OR and AND gates in pneumatic applications. Practical Examples involving the use of logic gates	24/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
37	25/6/2024	1	Use of Logic gates - OR and AND gates in pneumatic applications. Practical Examples involving the use of logic gates	25/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
38	27/6/2024	3	Pressure dependent controls- types - construction - practical applications, Time	27/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>

			dependent controls principle, Construction, practical applications				
39	28/6/2024	3	Pressure dependent controls- types - construction - practical applications, Time dependent controls principle, Construction, practical applications	28/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
40	29/6/2024	4	Coordinated and sequential motion control, Motion and control diagrams	29/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
41	1/7/2024	1	Coordinated and sequential motion control,	1/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
42	2/7/2024	3	Signal elimination methods, Cascading method- principle, Practical application examples	2/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
43	4/7/2024	3	Signal elimination methods, Cascading method- principle,	4/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
44	5/7/2024	4	signal input and output, pilot assisted solenoid control of directional control valves	5/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
45	8/7/2024	1	signal input and output	8/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
46	9/7/2024	3	Use of relay and contactors..	9/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
47	11/7/2024	3	Control circuitry for simple signal cylinder application	11/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
48	12/7/2024	4	Control circuitry for simple signal cylinder application	12/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
49	13/7/2024	1	, pilot assisted solenoid control of directional control valves	13/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
50	15/7/2024	3	, pilot assisted solenoid control of directional control valves	15/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
51	16/7/2024	3	Practical application examples	16/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
52	18/7/2024	4	Practical application examples	18/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
53	19/7/2024	1	Motion and control diagrams	19/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
54	22/7/2024	3	Motion and control diagrams	22/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
55	23/7/2024	3	Motion and control diagrams	23/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
56	25/7/2024	4	Reservoir System, Filters and	25/7/2024	4	<b>T1, R2</b>	<b>Smart</b>

			Strainers,				board , ppt
57	26/7/2024	1	Reservoir System, Filters and Strainers,	26/7/2024	1	T1, R2	Smart board , ppt
58	27/7/2024	3	Reservoir System, Filters and Strainers,	27/7/2024	3	T1, R2	Smart board , ppt
59	1/8/2024	3	Use of relay and contactors. Control circuitry for simple signal	1/8/2024	3	T1, R2	Smart board , ppt
60	2/8/2024	4	cylinder application	2/8/2024	4	T1, R2	Smart board , ppt
61	5/8/2024	1	cylinder application	5/8/2024	1	T1, R2	Smart board , ppt
62	6/8/2024	3	Use of relay and contactors. Control circuitry for simple signal cylinder application	6/8/2024	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
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- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	CCE-1 from the above list	6/6/2024
2	CCE-2 from the above list	26/7/2024



**Text Books:**

1. "Fluid Power with Applications", Anthony Esposito, Sixth edition, Pearson Education, Inc, 2000.  
'Pneumatics and Hydraulics', Andrew Parr, Jaico Publishing Co.
2. Fluid Mechanics and Fluid Machines, Dr. Bansal, R.K. Lakshmi Publications, 2004

**Reference Book:**

1. 'Oil Hydraulic systems', Principles and Maintenance S. R. Majurr, Tata McGraw Hill Publishing Company Ltd.
2. 'Industrial Hydraulics', Pippenger, Hicks" McGraw Hill, New York.



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Hechanahalli, Bangalore - 560 065

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☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### MECHATRONICS ENGINEERING LESSON PLAN

**Faculty Name: Mr.Jaideep R**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: INDUSTRIAL ROBOTICS (21MT63)**

**Year/Sem/Section: 3<sup>RD</sup> / VI**

**COURSE OBJECTIVES** This course will enable the students to  
CLO1. To gain knowledge on basics of Robotics  
CLO2. To understand Robot Kinematics and Dynamics, Sensors used in Robots  
CLO3. To understand basics of Robot programming and Artificial Intelligence  
CLO4. To gain knowledge on robot layout and cell design  
CLO5. To relate the knowledge on robotics and understand the application of Robots in Industries

#### **COURSE OUTCOMES:**

<b>CO1</b>	To understand the basics of robotics, sensors, Programming and Applications of Robots
<b>CO2</b>	To illustrate the different applications of robotics in Industries
<b>CO3</b>	To analyze simple robot kinematics.
<b>CO4</b>	To analyze simple robot dynamics
<b>CO5</b>	To design general robot cell layouts

SL.NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	29/4/2024	3	Fundamentals of Robotics	29/4/2024	3	T1, R2	Smart board , ppt
2.	30/4/2024	1	Fundamentals of Robotics	30/4/2024	1	T1, R2	Smart board , ppt
3.	1/5/2024	4	robot anatomy, work volume	1/5/2024	4	T1, R2	Smart board , ppt
4.	3/5/2024	2	robot anatomy, work volume	3/5/2024	2	T1, R2	Smart

							<b>board , ppt</b>	
<b>5.</b>	6/5/2024	3	robot drive systems	6/5/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>6.</b>	7/5/2024	1	robot drive systems	7/5/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>7.</b>	8/5/2024	4	control systems, precision of movement,	8/5/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>8.</b>	11/5/2024	2	control systems, precision of movement,	11/5/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>9.</b>	13/5/2024	3	control systems, precision of movement,	13/5/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>10</b>	14/5/2024	1	end effectors, robotic sensors,	14/5/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>11</b>	15/5/2024	4	end effectors, robotic sensors,	15/5/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>12</b>	17/5/2024	2	robot programming and work cell control	17/5/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>13</b>	20/5/2024	3	robot programming and work cell control	20/5/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>14</b>	21/5/2024	1	robot programming and work cell control	21/5/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>15</b>	22/5/2024	4	robot applications, problems	22/5/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>16</b>	24/5/2024	2	robot applications, problems	24/5/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>17</b>	25/5/2024	3	robot applications, problems	25/5/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>18</b>	3/6/2024	CIE 1						
<b>19</b>	4/6/2024							
<b>20</b>	5/6/2024							
<b>21</b>	4/6/2024	<b>1</b>	Basic control systems and components	4/6/2024	<b>1</b>	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>22</b>	7/6/2024	<b>4</b>	Basic control systems and components	7/6/2024	<b>4</b>	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>23</b>	10/6/2024	2	Basic control systems concepts and models	10/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>24</b>	11/6/2024	3	Basic control systems concepts and models	11/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>25</b>	12/6/2024	1	control system analysis,	12/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>26</b>	13/6/2024	4	control system analysis,	13/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>27</b>	14/6/2024	2	robot sensors and actuators.	14/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>28</b>	18/6/2024	3	robot sensors and actuators.	18/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>29</b>	19/6/2024	1	Robot Motion Analysis	19/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>	
<b>30</b>	21/6/2024	4	Robot Motion Analysis	21/6/2024	4	<b>T1, R2</b>	<b>Smart</b>	

							<b>board , ppt</b>
<b>31</b>	24/6/2024	2	Introduction to manipulator kinematics	24/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>32</b>	25/6/2024	3	homogeneous transformations and robot kinematics	25/6/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>33</b>	26/6/2024	1	homogeneous transformations and robot kinematics	26/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>34</b>	28/6/2024	4	D-H convention, manipulator path control	28/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>35</b>	29/6/2024	2	D-H convention, manipulator path control	29/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>36</b>	1/7/2024	3	robot dynamics, configuration of a robot controller	1/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>37</b>	2/7/2024	1	Robot End Effectors: types of end effecters	2/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>38</b>	3/7/2024	<b>CIE 2</b>					
<b>39</b>	4/7/2024						
<b>40</b>	5/7/2024						
<b>41</b>	8/7/2024	<b>4</b>	mechanical grippers	8/7/2024	<b>4</b>		
<b>42</b>	9/7/2024	2	other types of grippers	9/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>43</b>	10/7/2024	3	tools as end effectors, robot/end effector interface	10/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>44</b>	12/7/2024	1	tools as end effectors, robot/end effector interface	12/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>45</b>	13/7/2024	4	Robot Programming: Methods of robot programming	13/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>46</b>	15/7/2024	2	lead-through programming methods	15/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>47</b>	16/7/2024	3	a robot program as a path in space,	16/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>48</b>	19/7/2024	1	motion interpolation, wait, signal and delay commands, branching	19/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>49</b>	22/7/2024	4	capabilities and limitations of lead-through methods, problems	22/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>50</b>	23/7/2024	2	Artificial Intelligence (AI): Introduction & goals of AI in research, AI techniques	23/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>51</b>	24/7/2024	3	LISP programming, AI & robotics, LISP in factory, robotic paradigms, problems.	24/7/2024	3	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>52</b>	25/7/2024	<b>CIE 3</b>					
<b>53</b>	26/7/2024						
<b>54</b>	27/7/2024						
<b>55</b>	29/7/2024	<b>1</b>	Robot Cell Design & Control: Robot cell layouts, multiple robots and machine interference	29/7/2024	<b>1</b>	<b>T1, R2</b>	<b>Smart board , ppt</b>
<b>56</b>	30/7/2024	4	considerations in	30/7/2024	4	<b>T1, R2</b>	<b>Smart</b>

			work -cell design,				board , ppt
57	31/7/2024	2	work-cell control, interlocks, error detection and recovery, work -cell controller	31/7/2024	2	T1, R2	Smart board , ppt
58	31/7/2024	3	.cycle time analysis, graphic simulation of robotic work cells, problems.	31/7/2024	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignment	7/6/2024
2	Seminar	23/7/2024

#### Text Books:

1. Mikell P. Groover, Mitchel Weiss, Roger N. Nagel, Nicholas G. Odrey and Ashish Dutta, “Industrial Robotic

#### Reference Book:

1. Roland Siegwart, Illah R. Nourbakhsh, and Davide Scaramuzza, “Introduction to Autonomous Mobile Robots”, 2n Edition, PHI, 2011.



  
**Prof. & HOD**  
 Department of Mechatronics  
 The Oxford College Of Engineering  
 Bio-Channahalli, Bangalore - 560 076

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)**MECHATRONICS ENGINEERING**  
**LESSON PLAN****Faculty Name: Ms. Seema V****Academic Year: 22/4/2024 to 7/8/2024****SUB.CODE & Name: Hydraulics and Pneumatics (BMT405B)****Year/Sem/Section: 2<sup>nd</sup> / IV**

**COURSE OBJECTIVES** This course will enable the students to  
CLO1. To provide students with good depth of knowledge of Industrial IoT systems for various applications.  
CLO2. Knowledge for the design and analysis of industry 4.0 systems.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain the Knowledge of architecture , revolution of Industrial IoT System
<b>CO2</b>	Identify, formulate and solve engineering problems by using Industrial IoT.
<b>CO3</b>	Identify the technologies for IIOT
<b>CO4</b>	Analyse the different communication protocols fro IIOT applications
<b>CO5</b>	Ability to implement real field problem by gained knowledge of Industrial applications

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/2024	2	<b>Introduction to Industrial IoT (IIoT) Systems</b>	22/4/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
2.	23/4/2024	4	The Various Industrial Revolutions	23/4/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
3.	24/4/2024	1	The Various Industrial Revolutions	24/4/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>

4.	26/4/2024	2	The Various Industrial Revolutions	26/4/2024	2	T1, R2	Smart board , ppt
5.	29/4/2024	2	The Various Industrial Revolutions	29/4/2024	2	T1, R2	Smart board , ppt
6.	3/5/2024	4	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	3/5/2024	4	T1, R2	Smart board , ppt
7.	6/5/2024	1	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	6/5/2024	1	T1, R2	Smart board , ppt
8.	7/5/2024	2	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	7/5/2024	2	T1, R2	Smart board , ppt
9.	8/5/2024	2	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	8/5/2024	2	T1, R2	Smart board , ppt
10	13/5/2024	4	Role of Internet of Things (IoT) & Industrial Internet of Things (IIoT) in Industry	13/5/2024	4	T1, R2	Smart board , ppt
11	14/5/2024	1	Industry 4.0 revolutions	14/5/2024	1	T1, R2	Smart board , ppt
12	15/5/2024	2	Industry 4.0 revolutions	15/5/2024	2	T1, R2	Smart board , ppt
13	17/5/2024	2	Industry 4.0 revolution	17/5/2024	2	T1, R2	Smart board , ppt
14	20/5/2024	4	IIOT architecture, Support System for Industry 4.0 Smart Factories.	20/5/2024	4	T1, R2	Smart board , ppt
15	21/5/2024	1	IIOT architecture, Support System for Industry 4.0 Smart Factories.	21/5/2024	1	T1, R2	Smart board , ppt
16	22/5/2024	2	IIOT architecture, Support System for Industry 4.0 Smart Factories.	22/5/2024	2	T1, R2	Smart board , ppt
17	24/5/2024	2	IIOT architecture, Support System for Industry 4.0 Smart Factories.	24/5/2024	2	T1, R2	Smart board , ppt
18	27/5/2024	4	IIOT architecture, Support System for Industry 4.0 Smart Factories.	27/5/2024	4	T1, R2	Smart board , ppt
19	28/5/2024	1	IIOT architecture, Support System for Industry 4.0 Smart Factories.	28/5/2024	1	T1, R2	Smart board , ppt
20	29/5/2024	2	IIOT architecture, Support System for Industry 4.0 Smart Factories.	29/5/2024	2	T1, R2	Smart board , ppt
21	31/5/2024	2	IIOT architecture, Support System for Industry 4.0 Smart Factories.	31/5/2024	2	T1, R2	Smart board , ppt
22	3/6/2024	4	<b>Implementation systems for IIoT:</b>	3/6/2024	4	T1, R2	Smart board , ppt
23	4/6/2024	1	<b>Implementation systems for IIoT:</b>	4/6/2024	1	T1, R2	Smart board , ppt

24	5/6/2024	2	<b>Implementation systems for IIoT:</b>	5/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
25	7/6/2024	2	<b>Implementation systems for IIoT:</b>	7/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
26	10/6/2024	<b>CIE 1</b>					
27	11/6/2024						
28	12/6/2024						
29	18/6/2024	4	Sensors and Actuators for Industrial Processes	18/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
30	19/6/2024	1	Sensors and Actuators for Industrial Processes	19/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
31	20/6/2024	2	Sensors and Actuators for Industrial Processes	20/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
32	21/6/2024	2	Sensors and Actuators for Industrial Processes	21/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
33	24/6/2024	4	actuators categories,	24/6/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
34	25/6/2024	1	Sensor categories	25/6/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
35	26/6/2024	2	Sensor categories	26/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
36	28/6/2024	2	<b>IIoT Technologies</b>	28/6/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
37	1/7/2024	4	<b>IIoT Technologies</b>	1/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
38	2/7/2024	1	introduction, augmented reality	2/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
39	3/7/2024	2	introduction, augmented reality	3/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
40	5/7/2024	2	introduction, augmented reality	5/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
41	8/7/2024	4	virtual reality, big data and advanced analytics	8/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
42	9/7/2024	1	virtual reality, big data and advanced analytics	9/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
43	10/7/2024	2	smart factories, lean manufacturing system.	10/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
44	10/7/2024	2	smart factories, lean manufacturing system.	10/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
45	15/7/2024	4	smart factories, lean manufacturing system.	15/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
46	16/7/2024	1	<b>Industrial Transmission: Introduction Profibus</b>	16/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>

47	19/7/2024	2	<b>Industrial Transmission:</b> Introduction Profibus	19/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
48	22/7/2024	2	<b>Industrial Transmission:</b> Introduction Profibus	22/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
49	23/7/2024	4	features,components, Fiels bus- features,components,	23/7/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
50	24/7/2024	1	features,components, Fiels bus- features,components,	24/7/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>
51	26/7/2024	2	HART-features,components, CAN-features,components	26/7/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
52	29/7/2024	<b>CIE 2</b>					
53	30/7/2024						
54	31/7/2024						
55	5/8/2024	2	<b>IHOT case studies:</b> Health care and applications, Oil and Gas Industry	5/8/2024	2	<b>T1, R2</b>	<b>Smart board , ppt</b>
56	6/8/2024	4	Smart Office, manufacturing industry, automotive industry.	6/8/2024	4	<b>T1, R2</b>	<b>Smart board , ppt</b>
57	7/8/2024	1	Smart Office, manufacturing industry, automotive industry.	7/8/2024	1	<b>T1, R2</b>	<b>Smart board , ppt</b>

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignments	19/6/2024
2	Class presentations	2/8/2024

**Text Books:**

1. Misra, S., Mukherjee, A., & Roy, A. (2021). Forntmatter. In Introduction to IoT , Cambridge University Press.

**Reference Book:**

1. Industry 4.0: The Industrial Internet of Things Alasdair GilchristPublications



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
He. Channarayana, Bangalore - 560 008

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Bommanahalli, Hosur Road, Bangalore –560068.

☎: 080 -61754601/602, Fax: 080 – 25730551 E-mail: [engprincipal@theoxford.edu](mailto:engprincipal@theoxford.edu) Web: [www.theoxfordengg.org](http://www.theoxfordengg.org)

### MECHATRONICS ENGINEERING

### LESSON PLAN

**Faculty Name: Ms. Seema V**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: MICROCONTROLLER AND APPLICATIONS (BMT401)**

**Year/Sem/Section: 2<sup>nd</sup> / IV**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Microcontrollers, microprocessors, Different memory Architecture, interfacing techniques and 8051 architectures.

CLO2. Assembly language instructions, data types and application programming.

CLO3. C language instructions, data types and application programming, generating delays for different Time delay.

CLO4. Serial communication between two devices using assembly and C language programming, Interrupt handling and counter application using assembly and C language.

CLO5. The controller to real-world devices such as switches, display devices, motors, converters etc.

### **COURSE OUTCOMES:**

<b>CO1</b>	Describe the architecture of 8051 Microcontroller, microprocessor and internal memory organization, types.
<b>CO2</b>	Apply various instruction set of assembly and C language for different software and hardware applications.
<b>CO3</b>	Calculate time delays, baud rates and analyze Timer. Counter operation and Transmission of data serially for different modes of operation.
<b>CO4</b>	Design the hardware interface between microcontroller and memories of different size, external peripheral devices for real time application.
<b>CO5</b>	The controller to real-world devices such as switches, display devices, motors, converters etc.



SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/2024	4	Introduction, Microprocessors and Microcontrollers	22/4/2024	4	T1, R2	Smart board , ppt
2.	24/4/2024	2	A Microprocessors survey. RISC & CISC CPU Architectures	24/4/2024	2	T1, R2	Smart board , ppt
3.	25/4/2024	1	Harvard & Von-Neumann CPU architecture	25/4/2024	1	T1, R2	Smart board , ppt
4.	26/4/2024	4	The 8051 Architecture: Introduction,	26/4/2024	4	T1, R2	Smart board , ppt
5.	29/5/2024	4	8051 Microcontroller	29/5/2024	4	T1, R2	Smart board , ppt
6.	2/6/2024	2	Input / Output Pins, Ports and Internal Memory organization	2/6/2024	2	T1, R2	Smart board , ppt
7.	3/6/2024	1	Input / Output Pins, Ports and Internal Memory organization	3/6/2024	1	T1, R2	Smart board , ppt
8.	6/5/2024	4	External Memory (ROM & RAM) Interfacing	6/5/2024	4	T1, R2	Smart board , ppt
9.	8/5/2024	4	External Memory (ROM & RAM) Interfacing	8/5/2024	4	T1, R2	Smart board , ppt
10	9/5/2024	2	Introduction, addressing modes	9/5/2024	2	T1, R2	Smart board , ppt
11	13/5/2024	1	Introduction, addressing modes	13/5/2024	1	T1, R2	Smart board , ppt
12	15/5/2024	4	External data Moves,	15/5/2024	4	T1, R2	Smart board , ppt
13	16/5/2024	4	External data Moves,	16/5/2024	4	T1, R2	Smart board , ppt
14	17/5/2024	2	Code Memory,	17/5/2024	2	T1, R2	Smart board , ppt
15	20/5/2024	1	Read Only Data Moves / Indexed Addressing Mode	20/5/2024	1	T1, R2	Smart board , ppt
16	22/5/2024	4	Read Only Data Moves / Indexed Addressing Mode	22/5/2024	4	T1, R2	Smart board , ppt
17	23/5/2024	4	PUSH and POP Opcodes	23/5/2024	4	T1, R2	Smart board , ppt
18	24/5/2024	2	Data exchanges, Byte level logical Operations	24/5/2024	2	T1, R2	Smart board , ppt
19	27/5/2024	1	Bit level Logical Operations	27/5/2024	1	T1, R2	Smart board , ppt
20	29/5/2024	4	Rotate and Swap Operations,	29/5/2024	4	T1, R2	Smart board , ppt

21	30/5/2024	4	incrementing and Decrementing, Addition, Subtraction, Multiplication and Division, Decimal Arithmetic.	30/5/2024	4	T1, R2	Smart board , ppt
22	31/5/2024	2	JUMP and CALL Program range, Jumps, calls and Subroutines, Interrupts and Returns.	31/5/2024	2	T1, R2	Smart board , ppt
23	3/6/2024	1	Data types and time delays in 8051C	3/6/2024	1	T1, R2	Smart board , ppt
24	5/6/2024	4	I/O programming	5/6/2024	4	T1, R2	Smart board , ppt
25	6/6/2024	4	logic operations	6/6/2024	4	T1, R2	Smart board , ppt
26	7/6/2024	2	data conversion programs	7/6/2024	2	T1, R2	Smart board , ppt
27	10/6/2024	CIE 1					
28	11/6/2024	CIE 1					
29	12/6/2024	CIE 1					
30	19/6/2024	2	Timer / Counter Programming in 8051: Programming 8051 Timers, modes of Timer	19/6/2024	2	T1, R2	Smart board , ppt
31	20/6/2024	1	Basics of Serial Communication	20/6/2024	1	T1, R2	Smart board , ppt
32	21/6/2024	4	8051 connections to RS-232	21/6/2024	4	T1, R2	Smart board , ppt
33	24/6/2024	4	8051 Serial communication Programming	24/6/2024	4	T1, R2	Smart board , ppt
34	26/6/2024	2	Programming the second serial port	26/6/2024	2	T1, R2	Smart board , ppt
35	27/6/2024	1	Serial port programming in C.	27/6/2024	1	T1, R2	Smart board , ppt
36	28/6/2024	4	Interrupts Programming,8051 Interrupts, Programming Timer Interrupts	28/6/2024	4	T1, R2	Smart board , ppt
37	2/7/2024	4	Interrupts Programming,8051 Interrupts, Programming Timer Interrupts	2/7/2024	4	T1, R2	Smart board , ppt
38	1/7/2024	2	Interrupts Programming,8051 Interrupts, Programming Timer Interrupts	1/7/2024	2	T1, R2	Smart board , ppt
39	3/7/2024	1	Interrupt Priority in the 8051/52	3/7/2024	1	T1, R2	Smart board , ppt
40	4/7/2024	4	Interrupt Priority in the 8051/52	4/7/2024	4	T1, R2	Smart board , ppt
41	5/7/2024	4	Interrupt Priority in the 8051/52	5/7/2024	4	T1, R2	Smart board , ppt
42	10/7/2024	2	8051 Interfacing and Applications	10/7/2024	2	T1, R2	Smart

							board , ppt
43	8/7/2024	1	8051 Interfacing and Applications	8/7/2024	1	T1, R2	Smart board , ppt
44	10/7/2024	4	8051 Interfacing and Applications	10/7/2024	4	T1, R2	Smart board , ppt
45	11/7/2024	4	Hardware & Software	11/7/2024	4	T1, R2	Smart board , ppt
46	12/7/2024	2	Hardware & Software	12/7/2024	2	T1, R2	Smart board , ppt
47	15/7/2024	1	(Assembly code / C code) Interfacing of 8051 to simple switches and LEDs	15/7/2024	1	T1, R2	Smart board , ppt
48	18/7/2024	4	(Assembly code / C code) Interfacing of 8051 to simple switches and LEDs	18/7/2024	4	T1, R2	Smart board , ppt
49	19/7/2024	4	(Assembly code / C code) Interfacing of 8051 to simple switches and LEDs	19/7/2024	4	T1, R2	Smart board , ppt
50	22/7/2024	2	LCD, ADC	22/7/2024	2	T1, R2	Smart board , ppt
51	24/7/2024	1	LCD, ADC	24/7/2024	1	T1, R2	Smart board , ppt
52	25/7/2024	4	Stepper motor	25/7/2024	4	T1, R2	Smart board , ppt
53	26/7/2024	4	Stepper motor	26/7/2024	4	T1, R2	Smart board , ppt
54	29/7/2024			CIE 2			
55	30/7/2024			CIE 2			
56	31/7/2024			CIE 2			
57	1/8/2024	4	DC motor	1/8/2024	4	T1, R2	Smart board , ppt
58	2/8/2024	2	Temperature sensor	2/8/2024	2	T1, R2	Smart board , ppt
59	5/8/2024	1	Wave form generation	5/8/2024	1	T1, R2	Smart board , ppt
60	7/8/2024	4	Revision	7/8/2024	4	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Faculty can choose any two of the following:

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	Assignments	<b>19/6/2024</b>
2	Class presentations	<b>2/8/2024</b>

**Text Books:** “The 8051 Microcontroller Architecture, Programming & Applications”, 2e Kenneth J.

Ayala;Penram International, 1996 / Thomson Learning 2005

**Reference Book:** “Programming and Customizing the 8051 Microcontroller” Predko ;-, TMH



**Faculty**



**Prof. & HOD**  
Department of Mechatronics  
The Oxford College Of Engineering  
Itanagarahalli, Bangalore - 560 065

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### MECHATRONICS ENGINEERING

#### LESSON PLAN

**Faculty Name:** Mr.JAIDEEP R

**Academic Year:** 15/11/23 to 20/2/24

**SUB.CODE & Name:** UHV 1 BSCK307

**Year/Sem/Section:** 2<sup>nd</sup> / 3<sup>RD</sup> SEM

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

CLO2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence.

CLO3: Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.

CLO4: To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction .

#### **COURSE OUTCOMES:**

<b>CO1</b>	Enable the student to do a deep drive into societal challenges being addressed by NGO(s), social enterprises.
<b>CO2</b>	Build solutions to alleviate these complex social problems through immersion, design & technology.
<b>CO3</b>	Provide a formal platform for students to communicate and connect with their surroundings.
<b>CO4</b>	Enable to create of a responsible connection with society.
<b>CO5</b>	Organizing a food walk.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	17/11/23	6	Plantation and adoption of a tree: Plantation of a tree that will be adopted for four years by a group of B.Tech. students.	17/11/23	6	T1, R2	Smart board , ppt
2.	24/11/23	6	photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.	24/11/23	6	T1, R2	Smart board , ppt
3.	1/12/23	6	photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.	1/12/23	6	T1, R2	Smart board , ppt
4.	1/12/23	6	Heritage walk and crafts corner: Heritage tour, knowing the history and culture of the city	1/12/23	6	T1, R2	Smart board , ppt
5.	8/12/23	6	connecting to people around through their history,	8/12/23	6	T1, R2	Smart board , ppt
6.	15/12/23	6	knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.	15/12/23	6	T1, R2	Smart board , ppt
7.	22/12/23	6	Organic farming and waste management: usefulness of organic farming,	22/12/23	6	T1, R2	Smart board , ppt
8.	26/12/23	<b>CIE 1</b>					
9.	27/12/23						
10.	28/12/23						
11.	29/12/23						
12.	5/1/24						
13.	12/1/24	6	wet waste management in neighboring villages and implementation in the campus.	12/1/24	6	T1, R2	Smart board , ppt
14.	19/1/24	6	Water Conservation: knowing the present practices in the surrounding villages and implementation in the campus, documentary or photo blog presenting the current practices.	19/1/24	6	T1, R2	Smart board , ppt
15.	2/2/24	6	Food Walk City's culinary practices, food lore, and indigenous materials of the region used in cooking.	2/2/24	6	T1, R2	Smart board , ppt



16	9/2/24	6	Food Walk City's culinary practices, food lore, and indigenous materials of the region used in cooking.	9/2/24	6	T1, R2	Smart board , ppt
17	12/2/24	CIE 2					
18	13/2/24						
19	14/2/24						
20	15/2/24						
21	16/2/24	6	Food Walk City's culinary practices, food lore, and indigenous materials of the region used in cooking.	16/2/24	6	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

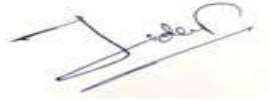
Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes
- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignments	15/12/2023
2	Class presentations	9/2/2024

**Text Books:** Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

**Reference Book:** Jeevan Vidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999



**Faculty**



**Prof. & HOD**  
**Department of Mechatronics**  
**The Oxford College Of Engineering**  
Hebbalahalli, Bangalore - 560 066

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### MECHATRONICS ENGINEERING

### LESSON PLAN

**Faculty Name: Ms. Seema V**

**Academic Year: 22/4/2024 to 7/8/2024**

**SUB.CODE & Name: UHV**

**Year/Sem/Section: 2<sup>nd</sup> / IV**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

CLO2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence.

CLO3: Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.

CLO4: To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction .

### **COURSE OUTCOMES:**

<b>CO1</b>	To help the students appreciate the essential complementarity 'VALUES' to ensure sustained happiness and prosperity which are the core aspirations of all human beings
<b>CO2</b>	To help the students appreciate the essential complementarity 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
<b>CO3</b>	To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence.
<b>CO4</b>	holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
<b>CO5</b>	To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.

SL. NO	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	22/4/2024	5	Introduction to Value Education	22/4/2024	5	T1, R2	Smart board , ppt
2.	29/4/2024	5	Introduction to Value Education	29/4/2024	5	T1, R2	Smart board , ppt
3.	6/5/2024	5	Introduction to Value Education	6/5/2024	5	T1, R2	Smart board , ppt
4.	13/5/2024	5	Harmony in the Human Being	13/5/2024	5	T1, R2	Smart board , ppt
5.	20/5/2024	5	Harmony in the Human Being	20/5/2024	5	T1, R2	Smart board , ppt
6.	27/5/2024	5	Harmony in the Human Being	27/5/2024	5	T1, R2	Smart board , ppt
7.	3/6/2024	5	Harmony in the Family and Society	3/6/2024	5	T1, R2	Smart board , ppt
8.	10/6/2024	<b>CIE 1</b>					
9.	11/6/2024						
10.	12/6/2024						
11.	24/6/2024	5		24/6/2024	5	T1, R2	Smart board , ppt
12.	1/7/2024	5	Harmony in the Family and Society	1/7/2024	5	T1, R2	Smart board , ppt
13.	8/7/2024	5	Harmony in the Nature/Existence	8/7/2024	5	T1, R2	Smart board , ppt
14.	15/7/2024	5	Harmony in the Nature/Existence	15/7/2024	5	T1, R2	Smart board , ppt
15.	22/7/2024	5	Implications of the Holistic Understanding – a Look at Professional Ethics	22/7/2024	5	T1, R2	Smart board , ppt
16.	29/7/2024	<b>CIE 2</b>					
17.	30/7/2024						
18.	31/7/2024						
19.	5/8/2024	5	Implications of the Holistic Understanding – a Look at Professional Ethics	5/8/2024	5	T1, R2	Smart board , ppt

**Continuous and Comprehensive Evaluation (CCE)**

**Faculty can choose any two of the following:**

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

Sr. No.	CCE Component	Submission due Date
1	Assignments	20/5/2024
2	Class presentations	22/7/2024

**Text Books:** Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

**Reference Book:** Jeevan Vidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999

*Seema*

**Faculty**

*C. S. R.*

**Prof. & HOD**  
**Department of Mechatronics**  
**The Oxford College Of Engineering**  
 Hebbal, Bangalore - 560 075



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**MECHATRONICS ENGINEERING**  
**LESSON PLAN**

**Faculty Name:** Ms. SEEMA V

**Academic Year:** 12/2/24 – 11/5/24

**SUB.CODE & Name:** MANAGEMENT INFORMATION SYSTEM 18MT824

**Year/Sem/Section:** 4<sup>TH</sup> / 8<sup>TH</sup> SEM

**COURSE OBJECTIVES** This course will enable the students to  
CLO1. Gain the importance of business.  
CLO2. Understand the importance used for effective decision making.  
CLO3. Understand the importance of applications in business.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain the importance of information in business.
<b>CO2</b>	Have knowledge on effective applications of information systems in business.
<b>CO3</b>	Understand the technologies used for effective decision making in an organization.
<b>CO4</b>	Understand the methods used for effective decision making in an organization.
<b>CO5</b>	Understand the applications for effective decision making in an organization.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/2/24	1	Data, Information	15/2/24	1	T1, R2	Smart board , ppt
2.	16/2/24	4	Intelligence, Information Technology	16/2/24	4	T1, R2	Smart board , ppt
3.	22/2/24	2	Information System, evolution,	22/2/24	2	T1, R2	Smart board , ppt
4.	23/2/24	4	types based on functions and hierarchy	23/2/24	4	T1, R2	Smart board , ppt
5.	29/2/24	1	System development methodologies	29/2/24	1	T1, R2	Smart



			, Functional Information Systems.				board , ppt
6.	1/3/24	4	System development methodologies , Functional Information Systems.	1/3/24	4	T1, R2	Smart board , ppt
7.	7/3/24	2	DSS, EIS, KMS, GIS	7/3/24	2	T1, R2	Smart board , ppt
8.	11/3/24	<b>CIE 1</b>					
9.	12/3/24						
10	13/3/24						
11	14/3/24	4	International Information System.	14/3/24	4	T1, R2	Smart board , ppt
12	15/3/24	1	SYSTEM ANALYSIS AND DESIGN: introduction.	15/3/24	1	T1, R2	Smart board , ppt
13	21/3/24	4	Case tools	21/3/24	4	T1, R2	Smart board , ppt
14	22/3/24	2	System flow chart	22/3/24	2	T1, R2	Smart board , ppt
15	28/3/24	4	Decision table	28/3/24	4	T1, R2	Smart board , ppt
16	4/4/24	<b>CIE 2</b>					
17	5/4/24						
18	6/4/24						
19	12/4/24	1	Data flow Diagram (DFD	12/4/24	1	T1, R2	Smart board , ppt
20	18/4/24	4	Entity Relationship (ER)	18/4/24	4	T1, R2	Smart board , ppt
21	19/4/24	2	Object Oriented Analysis	19/4/24	2	T1, R2	Smart board , ppt
22	25/4/24	4	Design (OOAD)	25/4/24	4	T1, R2	Smart board , ppt
23	26/4/24	1	UML diagram.	26/4/24	1	T1, R2	Smart board , ppt
24	2/5/24	4	DATABASE MANAGEMENT SYSTEMS : introduction.	2/5/24	4	T1, R2	Smart board , ppt
25	3/5/24	2	DBMS	3/5/24	2	T1, R2	Smart board , ppt
26	6/5/24	<b>CIE 3</b>					
27	7/5/24						
28	8/5/24						
29	9/5/24	4	HDBMS	9/5/24	4	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
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- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	7/3/24
2	ASSIGNMENT	28/3/24
3	ASSIGNMENT	2/5/24

**Text Books:**

1. Management Information Systems Mcgraw hill 2012.

**Reference Book:**

1. Management Information Systems for the Information Age Mc Cubbrey, McGraw Hill 2010.

*Seema*

**Faculty**

*Prof.*

**Prof. & HOD**  
**Department of Mechatronics**  
**The Oxford College Of Engineering**  
 Hebbal, Bangalore - 560 076

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**MECHATRONICS ENGINEERING**

**LESSON PLAN**

**Faculty Name: Mr. Jaideep R**

**Academic Year: 15/11/23 to 20/2/24**

**SUB.CODE & Name: MECHANICS OF SOLIDS AND FLUIDS 21MT34**

**Year/Sem/Section: 2<sup>ND</sup> / 3<sup>RD</sup> SEM**

**COURSE OBJECTIVES** This course will enable the students to

CLO1. Gain knowledge of linear elastic properties and stress strain relations.

CLO2. Derive and solve problems on Principal stresses developed in structures.

CLO3. Compute the stress strain for bars, beams, shafts, and column and to apply the concept of dynamic similarity and to apply it to experimental modelling.

CLO4. Gain knowledge of basic properties of fluids, fluid statics.

CLO5: To apply conservation of mass, momentum and energy equation.

**COURSE OUTCOMES:**

<b>CO1</b>	Gain the knowledge of properties, and stress-strain relations in linear elastic solid members and fluids. To understand the concepts of fluid statics, kinematics and dynamics.
<b>CO2</b>	Describe stress-strain equation for axial, bending and torsion loads while addressing problems in engineering
<b>CO3</b>	Apply the concepts of fluid statics, kinematics and dynamics while addressing problems in engineering and to determine the fluid flow through open and closed channel.
<b>CO4</b>	Determine the stress & strain for simple stresses, compound stresses, shafts & columns.
<b>CO5</b>	To apply conservation of mass, momentum and energy equation and to determine the discharge of fluid flow.

SL.N O	Planned		TOPICS TO BE COVERED	Execution		Text /Reference Book	Pedagogy (as per the syllabus)
	Date	Hr		Date	Hr		
1.	15/11/23	4	Simple Stress and Strain: Introduction	15/11/23	4	T1, R2	Smart board , ppt
2.	16/11/23	4	Concept of Stress and Strain, Linear elasticity, Hooke's Law and Poisson's ratio.	16/11/23	4	T1, R2	Smart board , ppt
3.	16/11/23	3	Concept of Stress and Strain, Linear elasticity, Hooke's Law and Poisson's ratio.	16/11/23	3	T1, R2	Smart board , ppt
4.	17/11/23	1	Concept of Stress and Strain, Linear elasticity,	17/11/23	1	T1, R2	Smart board , ppt
5.	17/11/23	3	Extension / Shortening of a bar, bars with varying cross sections	17/11/23	3	T1, R2	Smart board , ppt
6.	20/11/23	4	Extension / Shortening of a bar, bars with varying cross sections	20/11/23	4	T1, R2	Smart board , ppt
7.	21/11/23	4	Extension / Shortening of a bar, bars with varying cross sections	21/11/23	4	T1, R2	Smart board , ppt
8.	22/11/23	3	Elongation due to self-weight	22/11/23	3	T1, R2	Smart board , ppt
9.	23/11/23	1	Elongation due to self-weight	23/11/23	1	T1, R2	Smart board , ppt
10	24/11/23	3	Principle of super position, St. Venant's Principle.	24/11/23	3	T1, R2	Smart board , ppt
11	24/11/23	4	expression for volumetric strain	24/11/23	4	T1, R2	Smart board , ppt
12	24/11/23	4	Elastic Constants and relations.	24/11/23	4	T1, R2	Smart board , ppt
13	27/11/23	3	Stresses in Composite Section	27/11/23	3	T1, R2	Smart board , ppt
14	28/11/23	1	Compound Stresses: Introduction	28/11/23	1	T1, R2	Smart board , ppt
15	28/11/23	3	Concept of Plane stress, Stress tensor for plane stress	28/11/23	3	T1, R2	Smart board , ppt
16	29/11/23	4	Concept of Plane stress, Stress tensor for plane stress	29/11/23	4	T1, R2	Smart board , ppt
17	29/11/23	4	stresses on inclined sections	29/11/23	4	T1, R2	Smart board , ppt
18	1/12/23	3	stresses on inclined sections	1/12/23	3	T1, R2	Smart board , ppt
19	1/12/23	1	principal stresses and	1/12/23	1	T1, R2	Smart

			maximum shear stresses,				board , ppt
20	4/12/23	3	Mohr's circle for plane stress.	4/12/23	3	T1, R2	Smart board , ppt
21	5/12/23	4	Mohr's circle for plane stress.	5/12/23	4	T1, R2	Smart board , ppt
22	6/12/23	4	Torsion of Circular Shafts: Introduction Pure torsion, assumptions,	6/12/23	4	T1, R2	Smart board , ppt
23	7/12/23	3	derivation of torsional equations,	7/12/23	3	T1, R2	Smart board , ppt
24	8/12/23	1	Polar modulus, torsional rigidity / stiffness of shafts	8/12/23	1	T1, R2	Smart board , ppt
25	11/12/23	3	Power transmitted by solid shaft	11/12/23	3	T1, R2	Smart board , ppt
26	12/12/23	4	Euler's theory for axially loaded elastic long columns	12/12/23	4	T1, R2	Smart board , ppt
27	13/12/23	4	Derivation of Euler's load for various end conditions	13/12/23	4	T1, R2	Smart board , ppt
28	14/12/23	3	limitations of Euler's theory, Rankine's formula.	14/12/23	3	T1, R2	Smart board , ppt
29	15/12/23	1	introduction to Fluid mechanics: Introduction, Properties of fluids- mass density, weight density, specific volume, specific gravity, viscosity, surface tension, capillarity	15/12/23	1	T1, R2	Smart board , ppt
30	18/12/23	3	vapour pressure, compressibility and bulk modulus. Concept	18/12/23	3	T1, R2	Smart board , ppt
31	19/12/23	4	vapour pressure, compressibility and bulk modulus. Concept	19/12/23	4	T1, R2	Smart board , ppt
32	20/12/23	4	vapour pressure, compressibility and bulk modulus. Concept	20/12/23	4	T1, R2	Smart board , ppt
33	21/12/23	3	types of fluids pressure at a point in the static mass of fluid, variation of pressure	21/12/23	3	T1, R2	Smart board , ppt
34	22/12/23	1	types of fluids pressure at a point in the static mass of fluid, variation of pressure	22/12/23	1	T1, R2	Smart board , ppt
35	26/12/23	CIE 1					
36	27/12/23						
37	28/12/23						
38	29/12/23						
39	1/1/24	3	. types of fluids pressure at a point in the static mass of fluid, variation of pressure	1/1/24	3	T1, R2	Smart board , ppt
40	2/1/24	4	Pascal's law, absolute, gauge,	2/1/24	4	T1, R2	Smart



			atmospheric and vacuum pressures; pressure measurement by simple,				board , ppt
41	3/1/24	4	Pascal's law, absolute, gauge, atmospheric and vacuum pressures; pressure measurement by simple,	3/1/24	4	T1, R2	Smart board , ppt
42	4/1/24	3	Total pressure and centre of pressure for horizontal plane,	4/1/24	3	T1, R2	Smart board , ppt
43	5/1/24	1	Total pressure and centre of pressure for horizontal plane,	5/1/24	1	T1, R2	Smart board , ppt
44	8/1/24	3	vertical plane surface and inclined plane surface submerged in static fluid.	8/1/24	3	T1, R2	Smart board , ppt
45	9/1/24	4	vertical plane surface and inclined plane surface submerged in static fluid.	9/1/24	4	T1, R2	Smart board , ppt
46	10/1/24	4	Fluid Kinematics: Velocity of fluid particle, types of fluid flow, description of flow	10/1/24	4	T1, R2	Smart board , ppt
47	11/1/24	3	continuity equation, Coordinate free form, acceleration of fluid particle	11/1/24	3	T1, R2	Smart board , ppt
48	12/1/24	1	continuity equation, Coordinate free form, acceleration of fluid particle	12/1/24	1	T1, R2	Smart board , ppt
49	16/1/24	3	continuity equation, Coordinate free form, acceleration of fluid particle	16/1/24	3	T1, R2	Smart board , ppt
50	17/1/24	4	rotational & irrotational flow, equation in velocity potential	17/1/24	4	T1, R2	Smart board , ppt
51	18/1/24	4	rotational & irrotational flow, equation in velocity potential	18/1/24	4	T1, R2	Smart board , ppt
52	19/1/24	3	Poisson's equation in stream function, flownet.	19/1/24	3	T1, R2	Smart board , ppt
53	22/1/24	1	Fluid Dynamics; Introduction. Forces acting on fluid in motion. Euler's equation of motion along a streamline	22/1/24	1	T1, R2	Smart board , ppt
54	23/1/24	3	Fluid Dynamics; Introduction. Forces acting on fluid in motion. Euler's equation of motion along a streamline	23/1/24	3	T1, R2	Smart board , ppt
55	24/1/24	4	Integration of Euler's equation to obtain Bernoulli's equation	24/1/24	4	T1, R2	Smart board , ppt
56	25/1/24	4	Integration of Euler's equation to obtain Bernoulli's equation	25/1/24	4	T1, R2	Smart board , ppt
57	29/1/24	3	Assumptions and limitations of Bernoulli's equation. Major head	29/1/24	3	T1, R2	Smart board , ppt

			loss				
58	30/1/24	1	Introduction to Navier-Stokes equation. Application of Bernoulli's theorem	30/1/24	1	T1, R2	Smart board , ppt
59	31/1/24	3	Introduction to Navier-Stokes equation. Application of Bernoulli's theorem	31/1/24	3	T1, R2	Smart board , ppt
60	1/2/24	4	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube.	1/2/24	4	T1, R2	Smart board , ppt
61	2/2/24	4	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube.	2/2/24	4	T1, R2	Smart board , ppt
62	5/2/24	3	venturi-meter, orifice meter, rectangular and triangular notch, pitot tube	5/2/24	3	T1, R2	Smart board , ppt
63	6/2/24	1	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube. Problems	6/2/24	1	T1, R2	Smart board , ppt
64	7/2/24	3	venturi-meter, orifice meter, rectangular andtriangular notch, pitot tube. Problems	7/2/24	3	T1, R2	Smart board , ppt
65	8/2/24	4	venturi-meter, orifice meter, rectangular and triangular notch, pitot tube Problems	8/2/24	4	T1, R2	Smart board , ppt
66	9/2/24	4	Revision	9/2/24	4	T1, R2	Smart board , ppt
67	12/2/24	<b>CIE 2</b>					
68	13/2/24						
69	14/2/24						
70	15/2/24						
71	16/2/24	3	Revision	16/2/24	3	T1, R2	Smart board , ppt
72	19/2/24	1	Revision	19/2/24	1	T1, R2	Smart board , ppt
73	20/2/24	3	Revision	20/2/24	3	T1, R2	Smart board , ppt

### Continuous and Comprehensive Evaluation (CCE)

Faculty can choose any two of the following:

- i) Assignments (Individual and/or Group)
- ii) Seminars
- iii) Oral/Online Quizzes

- iv) Group Discussions
- v) Case studies/Case lets
- vi) Practical orientation on Design Thinking, Creativity & Innovation
- vii) Participatory & Industry-integrated learning
- viii) Practical activities / problem solving exercises
- ix) Class presentations
- x) Analysis of Industry/Technical/Business Reports
- xi) Reports on Guest Lectures / Webinars / Industrial Visits
- xii) Industrial / Social / Rural projects
- xiii) Participation in Seminars/ Academic Events/Symposia, etc.
- xiv) Any other academic activity

<b>Sr. No.</b>	<b>CCE Component</b>	<b>Submission due Date</b>
1	ASSIGNMENT	21/12/2023
2	SEMINAR	8/2/2024

**Text Books:**

1. Mechanics of Materials Ferdinand Beer & Russell Johnston 2003.

**Reference Book:**

1. Mechanics of Materials Ferdinand Beer & Russell Johnston 2003.



**Faculty**



**Prof. & HOD**  
**Department of Mechatronics**  
**The Oxford College Of Engineering**  
 Hebbal, Bangalore - 560 076

IOAC