



MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE

(An Autonomous Institution)

Affiliated to JNTUA, Anantapur & Approved by AICTE, New Delhi

(An ISO 9001-2008 Certified Institution)

Post Box No. 14, Angallu, Madanapalle – 517325.

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Web: www.mits.ac.in

DEPARTMENT OF MECHANICAL ENGINEERING

CIRCULAR

Date: 04-05-2023

It is hereby informed to all the members of program assessment committee that **program assessment committee** meeting is scheduled on 06-05-2023 at 02:30 pm, at the CAD/CAM Lab II, MITS Madanapalle, for reviewing the course structure and syllabus for fourth year (I semester & II semester) R20 syllabus.

Agenda:

1. Discuss about the PO/PSO attainment of 2018-22 batch
2. Reviewing fourth year R-20 syllabus
3. Discussion on fourth year R-20 course structure
4. Discussion on department vision and mission
5. Any other matter with the permission of the chair

The following PAC faculty members are requested to attend the meeting.

1. Dr. M. Lakshmana Rao
2. Dr. I. Arun *IA*
3. Dr. S. Baskaran *SB*
4. Dr. K. V. Nagesha *KN*
5. Dr. P. Sivaiah *PS*
6. Dr. R. Prithivi Rajan *PR*

7. Dr. Kamlesh Kumar
8. Dr. Anantha Raman L *AR*
9. Dr. Arun Kumar.D *AK*
10. Dr. Manish Sharma *MS*
11. Dr. Satyajit Pattanayak *SP*

M. Lakshmana Rao

Dr. M. Lakshmana Rao

Professor & Head, Department of ME

Copy to

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- The Vice-Principal (Academics)
- PAC & Department file

Head of the Department
Mechanical Engineering
Madanapalle Institute of Technology & Science
MADANAPALLE - 517 325



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DEPARTMENT OF MECHANICAL ENGINEERING

Date: 04-05-2023

COMPOSITION AND APPROVAL OF PROGRAM ASSESSMENT COMMITTEE (PAC)

The following members are nominated and approved for the constitutions of Program Assessment Committee (PAC).

1.	Dr. M. Lakshmana Rao	Professor & Head, Mechanical Engineering, MITS
2.	Dr. I. Arun	Professor, Mechanical Engineering, MITS
3.	Dr. S. Baskaran	Assoc. Professor, Mechanical Engineering, MITS
4.	Dr. K. V. Nagesha	Assoc. Professor, Mechanical Engineering, MITS
5.	Dr. P. Sivaiah	Assoc. Professor, Mechanical Engineering, MITS
6.	Dr. R. Prithivi Rajan	Assoc. Professor, Mechanical Engineering, MITS
7.	Dr. Kamlesh Kumar	Asst. Professor, Mechanical Engineering, MITS
8.	Dr. Anantha Raman L	Asst. Professor, Mechanical Engineering, MITS
9.	Dr. Arun Kumar.D	Asst. Professor, Mechanical Engineering, MITS
10.	Dr. Manish Sharma	Asst. Professor, Mechanical Engineering, MITS
11.	Dr. Satyajit Pattanayak	Asst. Professor, Mechanical Engineering, MITS

Responsibilities of the committee:

1. Monitors attainment of COs, POs & PSOs.
2. Evaluate program effectiveness and process necessary changes.
3. Preparation of periodic reports, records on program activities, progress, and status reports.

Dr. M. Lakshmana Rao

Professor & Head, Department of ME

Head of the Department
Mechanical Engineering
Madanapalle Institute of Technology & Science
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Dr. C. Yuvaraj

Principal, MITS

Principal
Madanapalle Institute of
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DEPARTMENT OF MECHANICAL ENGINEERING

Date: 08-05-2023

Program Assessment Committee (PAC)

Minutes of meeting held on 06-05-2023, 02:30 PM – 04:00 PM & Action taken report

Venue: CAD CAM Lab II, West Block, MITS

Agenda:

1. Discuss the PO/PSO attainment of the 2018-22 batch
2. Reviewing fourth year R-20 syllabus
3. Discussion on fourth-year R-20 Honors & Minor Syllabus
4. Discussion on department vision and mission

Minutes:

1. The Head of the Department, Dr. M. Lakshmana Rao welcomed all members to the PAC meeting.
2. Dr. M. Lakshmana Rao presented the agenda of the PAC meeting.
3. Dr. M. Lakshmana Rao handed the session to Dr. Anantha Raman L., Academic Coordinator to present PO/PSO attainment of 2018-2022 B.Tech. Mechanical batch.
4. Dr. Anantha Raman L. presented the overall and subject-wise PO/PSO attainment of 2018-2022 B.Tech. Mechanical batch.
5. PO6, PO9, PO10, and PO10 have attainment levels "3" and the remaining PO attainment levels were "2".
6. It has been observed that the PO/PSO attainment levels were low for PO/PSOs mapped with analytical subjects with higher bloom levels.
7. The PO/PSO as well CO levels of 46 subjects were presented and discussed.
8. The mapping procedure and calculations involved in direct, indirect, and overall attainment levels were also discussed.
9. The PO/PSO levels of 2016-20, 2017-21 and 2018-22 were compared.
10. The members suggested improving attainment levels by taking measures to increase the marks scored by students in internal and external examinations, especially for analytical subjects like Differential Equations and Laplace Transform, Mechanics of Solids, Thermodynamics, Dynamics of Machinery, etc.,
11. The PO/PSO attainment levels for the 2018-2022 batch are mentioned below:



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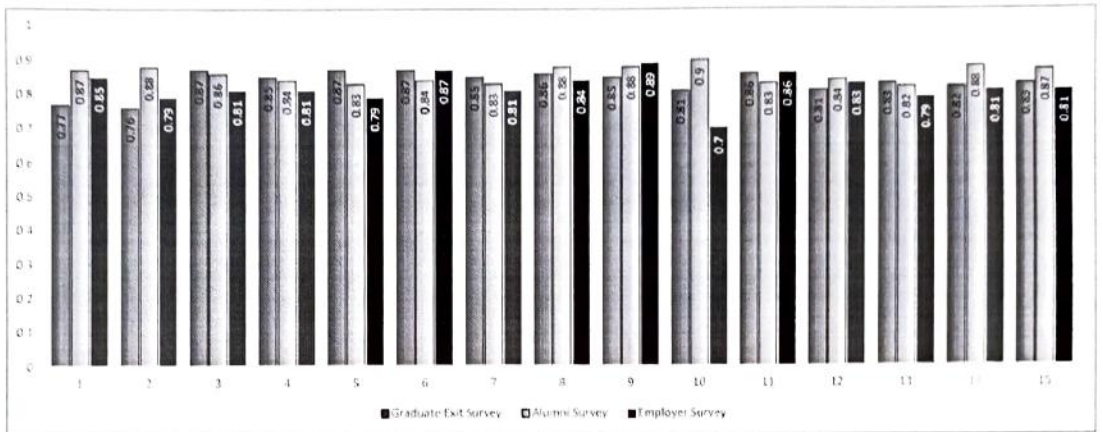
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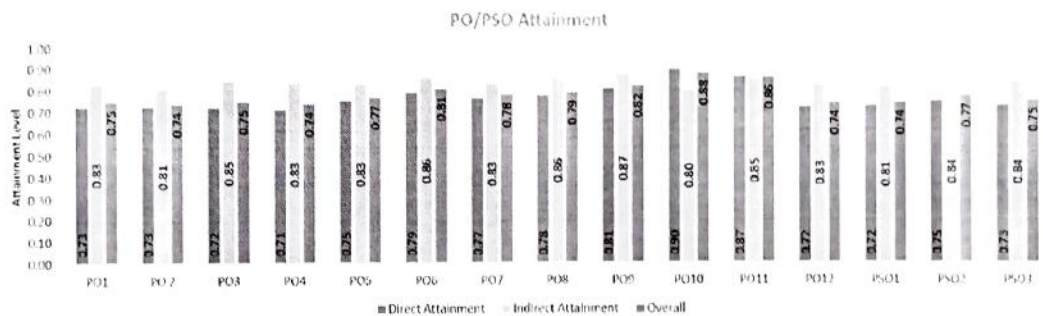
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	PO Indirect Attainment															
Graduate Exit Survey	0.77	0.76	0.87	0.85	0.87	0.87	0.85	0.86	0.85	0.81	0.86	0.81	0.83	0.82	0.83	
Alumni Survey	0.87	0.88	0.86	0.84	0.83	0.84	0.83	0.88	0.88	0.9	0.83	0.84	0.82	0.88	0.87	
Employer Survey	0.85	0.79	0.81	0.81	0.79	0.87	0.81	0.84	0.89	0.7	0.86	0.83	0.79	0.81	0.81	
Average	0.83	0.81	0.85	0.83	0.83	0.86	0.83	0.86	0.87	0.80	0.85	0.83	0.81	0.84	0.84	



Assessment Method	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Direct Attainment	0.73	0.73	0.72	0.71	0.75	0.79	0.77	0.78	0.81	0.90	0.87	0.72	0.72	0.75	0.73
Indirect Attainment	0.83	0.81	0.85	0.83	0.83	0.86	0.83	0.86	0.87	0.80	0.85	0.83	0.81	0.84	0.84
Overall	0.75	0.74	0.75	0.74	0.77	0.81	0.78	0.79	0.82	0.85	0.86	0.74	0.74	0.77	0.75
Average Attainment	2	2	2	2	2	3	2	2	3	3	3	2	2	2	2



12. Dr. Anantha Raman L. presented the course structure for R20 4-1, and 4-2 semesters and presented syllabi for all subjects to be offered in 4-1 semester.

13. The members recommended changes in the following elective subjects:

- Introduce "Entrepreneurship and Project Management" instead of "Design and Analysis of Welded Structures" under Professional Elective III.
- Introduce "Renewable Energy Systems" instead of "Solar Energy for Process Heat and Power Generation" under Professional Elective III.
- Introduce "Nano Technology" instead of "Industrial Corrosion and Tribology" under Professional Elective III.



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- d. Introduce “Electric Vehicle Technology” instead of “Industrial and Automobile Battery Technologies” under Professional Elective IV.
 - e. Introduce “Additive Manufacturing” instead of “Design of Pressure Vessels and Piping Systems” under Professional Elective IV.
 - f. Introduce “Fundamentals of Aerodynamics” instead of “Design of Heat Exchangers” under Professional Elective IV.
 - g. Introduce “Gas Dynamics and Jet Propulsion” instead of “Design of Gas Turbine Engines” under Professional Elective V.
 - h. Introduce “Power Plant Engineering” instead of “Design of Power Plant Systems” under Professional Elective V.
 - i. Introduce “Advanced Manufacturing Technologies” instead of “Mechatronics” under Skill Oriented Course (SOC) V.
 - j.
14. The summer internship is mandatory for all students. Every student must undergo an internship during their 2-2 & 3-2 semesters vacations. They need to submit a report on the internship undergone during the upcoming semester, i.e., 3-1 & 4-1.
15. The course structure for 4-1 & 4-2 semesters are mentioned below:

IV Year I Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	PE		Professional Elective-III (Annexure-III)	3	0	0	3	3
2	PE		Professional Elective-IV (Annexure-III)	3	0	0	3	3
3	PE		Professional Elective-V (Annexure-III)	3	0	0	3	3
4	OE		Open Elective-III (Annexure-II)	3	0	0	3	3
5	OE		Open Elective-IV (Annexure-II)	3	0	0	3	3
6	OE-HSMC		Open Elective-V (Taken from Humanities & Social Science) (Annexure-II)	3	0	0	3	3
7	SC		Skill Oriented Course-V (Annexure-IV)	1	0	2	3	2
8	PROJ	20ME702	Summer Internship-II*	0	0	6	6	3
Total				19	0	8	27	23

* 2 Months' internship during 3rd year summer vacation and to be evaluated in IV Year I Semester

IV Year II Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	PROJ	20ME703	Project Work, Seminar and Internship in Industry (6 months)	0	0	24	24	12
Total				0	0	24	24	12



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16. The list of Professional Elective-III, IV & V subjects offered for 4-1 semester are listed below.

Professional Elective – III		
Sl. No.	Course Code	Course Title
1.	20ME407	Entrepreneurship and Project Management
2.	20ME408	Refrigeration and Air Conditioning
3.	20ME409	Internet of Manufacturing Things
4.	20ME410	Renewable Energy Systems
5.	20ME411	Nano Technology
Any advanced courses can be appended in future.		

Professional Elective – IV		
Sl. No.	Course Code	Course Title
1.	20ME412	Electric Vehicle Technology
2.	20ME413	Additive Manufacturing
3.	20ME414	Fundamentals of Aerodynamics
4.	20ME415	Non Destructive Testing
5.	20ME416	Total Quality Management
Any advanced courses can be appended in future.		

Professional Elective – V		
Sl. No.	Course Code	Course Title
1.	20ME417	Mechanical Vibrations
2.	20ME418	Gas Dynamics and Jet Propulsion
3.	20ME419	Manufacturing of Composite Materials
4.	20ME420	Power Plant Engineering
5.	20ME421	Operations Research
Any advanced courses can be appended in future.		



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17. The list of Skill Oriented Course-IV subjects offered for 3-2 semester is listed below.

Skill Oriented Course- V		
Sl. No.	Course Code	Course Title
1.	20ME604	Advanced Manufacturing Technologies
Any advanced courses can be appended in future.		

18. The list of courses for Honors in Mechanical Engineering (20 Credits) has been discussed and listed below:

ANNEXURE – VI

Honors in Mechanical Engineering

Sl. No	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact	
III Year I Semester								
1	Professional Elective Course (Choose any two from three courses)	20HDME101	Advanced Welding Technology	3	0	0	3	3
2		20HDME102	Design and Analysis of Welded Structures	3	0	0	3	3
3		20HDME103	Combustion and Emissions	3	0	0	3	3
Sub				6	0	0	6	6
III Year II Semester								
4	Professional Elective Course (Choose any two from three courses)	20HDME104	Ergonomics	3	0	0	3	3
5		20HDME105	Solar Energy for Process Heat and Power Generation	3	0	0	3	3
6		20HDME106	Fracture Mechanics	3	0	0	3	3
Sub				6	0	0	6	6
IV Year I Semester								
7	Professional Elective Course (Choose any two from three)	20HDME107	Powder Metallurgy	3	0	0	3	3
8		20HDME108	Advanced Fluid Mechanics	3	0	0	3	3
9		20HDME109	Modelling of SI and CI Engines	3	0	0	3	3
10	SOC	20HDME601	Simulation and Analysis using ANSYS	1	0	2	3	2
Sub Total				7	0	2	9	8
Total				19	0	2	21	20



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19. The list of courses for Minors in Mechanical Engineering (20 Credits) has been discussed and listed below. It has been decided to offer minors in only 2 streams, 1. Digital Manufacturing and 2. Energy Engineering.

ANNEXURE – V

Minor in Mechanical Engineering

(Applicable to CE, EEE, ECE, CSE, CST, CS – AI, CS – DS, CS – CSY & CS - IOT)

Stream Name: Digital Manufacturing

Sl. No	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact	
III Year I Semester								
1	Professional Core Course	20MDME101	Computer Aided Manufacturing Process	3	0	0	3	3
2	Professional Core Course	20MDME102	Product Design and Development	3	0	0	3	3
III Year II Semester								
3	Professional Core Course	20MDME103	Digital Manufacturing Planning and Control	3	0	0	3	3
4	Professional Core Course	20MDME104	Big Data Analytics for Manufacturing	3	0	0	3	3
5	Professional Core Course	20MDME201	Computer Aided Design and Manufacturing Laboratory	0	0	4	4	2
IV Year I Semester								
6	Professional Core Course	20MDME105	Smart Sensors and Industry 4.0	3	0	0	3	3
7	Professional Core Course	20MDME106	Lean Manufacturing	3	0	0	3	3
Total				18	0	4	22	20



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Minor in Mechanical Engineering

(Applicable to CE, EEE, ECE, CSE, CST, CS – AI, CS – DS, CS – CSY & CS - IOT)

Stream Name: Energy Engineering

Sl. No	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact Hours	
III Year I Semester								
1	Professional Core Course	20MDME107	Fluid Mechanics and Hydraulic Machinery	2	1	0	3	3
2	Professional Core Course	20MDME108	Applied Thermodynamics	2	1	0	3	3
III Year II Semester								
3	Professional Core Course	20MDME109	Heat Transfer	2	1	0	3	3
4	Professional Core Course	20MDME110	Computational Fluid Dynamics	2	1	0	3	3
5	Professional Core Course	20MDME202	Thermal Engineering Laboratory	0	0	4	4	2
IV Year I Semester								
6	Professional Core Course	20MDME111	Design of Gas Turbine Engines	2	1	0	3	3
7	Professional Core Course	20MDME112	Fluid Power System	2	1	0	3	3
Total				12	6	4	22	20

20. Dr. Anantha Raman L. presented the department's vision and mission.
21. The members recommended not to make any changes to the department's vision and mission statements and recommended keeping it as it is.
22. Dr. M. Lakshmana Rao concluded the meeting and thanked all the members for attending and contributing to the improvement of the curriculum and syllabus.
23. The committee discussed the conduction of the IAAB meeting and has decided to schedule the IAAB meeting on 03-06-2023 via Online mode.



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DEPARTMENT OF MECHANICAL ENGINEERING

24. The subject-wise syllabus of all 4-1 subjects has been attached with the minutes for reference.

Approval:

The above-mentioned meeting minutes have been approved by the following members of the Program Assessment Committee (PAC).

Sl. No.	Member Name	Member Designation	Member Signature
1.	Dr. M. Lakshmana Rao	Professor & Head, Mechanical Engineering, MITS	
2.	Dr. I. Arun	Professor, Mechanical Engineering, MITS	
3.	Dr. S. Baskaran	Professor, Mechanical (Assoc.) Engineering, MITS	
4.	Dr. K. V. Nagesha	Assoc. Professor, Mechanical Engineering, MITS	
5.	Dr. P. Sivaiah	Assoc. Professor, Mechanical Engineering, MITS	
6.	Dr. R. Prithivi Rajan	Assoc. Professor, Mechanical Engineering, MITS	
7.	Dr. Kamlesh Kumar	Asst. Professor, Mechanical Engineering, MITS	
8.	Dr. Anantha Raman L	Asst. Professor, Mechanical Engineering, MITS	
9.	Dr. Arun Kumar.D	Asst. Professor, Mechanical Engineering, MITS	
10.	Dr. Manish Sharma	Asst. Professor, Mechanical Engineering, MITS	
11.	Dr. Satyajit Pattanayak	Asst. Professor, Mechanical Engineering, MITS	

Dr. M. Lakshmana Rao

Professor & Head, Department of ME

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Dr. C. Yuvaraj
Principal, MITS

Principal
Madanapalle Institute of
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B. Tech. Mechanical Engineering

R20 - Curriculum Structure

I Year I Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	HSMC	20ENG101	Professional English	3	0	0	3	3
2	BSC	20MAT101	Engineering Calculus	3	1	0	4	4
3	BSC	20CHE101	Engineering Chemistry	3	0	0	3	3
4	ESC	20ME101	Engineering Graphics	2	0	2	4	3
5	ESC	20CSE101	Programming for Problem Solving (Python)	2	0	3	5	3.5
6	BSC	20CHE201	Chemistry Laboratory	0	0	3	3	1.5
7	ESC	20ME201	Workshop Practice	0	0	3	3	1.5
Total				13	1	11	25	19.5

I Year II Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	BSC	20MAT102	Linear Algebra and Differential Equations	3	0	0	3	3
2	BSC	20PHY101	Engineering Physics	3	1	0	4	4
3	ESC	20EEE101	Basic Electrical Engineering	3	1	0	4	4
4	ESC	20CSE102	C Programming and Data Structures	3	0	0	3	3
5	HSMC	20ENG201	English for Professional Purposes Laboratory	0	0	2	2	1
6	BSC	20PHY201	Physics Laboratory	0	0	3	3	1.5
7	ESC	20EEE201	Electrical Engineering Laboratory	0	0	3	3	1.5
8	ESC	20CSE201	C Programming and Data Structures Laboratory	0	0	3	3	1.5
Total				12	2	11	25	19.5

(L = Lecture, T = Tutorial, P = Practical, C = Credit)

B. Tech. Mechanical Engineering**II Year I Semester**

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	BSC	20MAT103	Numerical Methods	3	0	0	3	3
2	ESC	20ME102	Engineering Mechanics	2	1	0	3	3
3	PCC	20ME103	Basic Thermodynamics	2	1	0	3	3
4	PCC	20ME104	Materials Science and Engineering	3	0	0	3	3
5	PCC	20ME105	Fluid Mechanics and Hydraulic Machinery	2	1	0	3	3
6	PCC	20ME202	Materials Science and Engineering Laboratory	0	0	3	3	1.5
7	PCC	20ME203	Fluid Mechanics and Hydraulic Machinery Laboratory	0	0	3	3	1.5
8	PCC	20ME204	3-D Modelling Laboratory	0	0	3	3	1.5
9	SC		Skill Oriented Course-I (Annexure-IV)	1	0	2	3	2
10	MC	20CHE901	Environmental Science	2	0	0	2	0
Total				15	3	11	29	21.5

II Year II Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	HSMC	20HUM101	Economics and Financial Accounting for Engineers	3	0	0	3	3
2	BSC	20MAT108	Probability and Statistics	3	0	0	3	3
3	PCC	20ME106	Mechanics of Solids	2	1	0	3	3
4	PCC	20ME107	Theory of Machines	2	1	0	3	3
5	PCC	20ME108	Manufacturing Technology-I	3	0	0	3	3
6	PCC	20ME205	Manufacturing Technology-I Laboratory	0	0	3	3	1.5
7	PCC	20ME206	Mechanics of Solids Laboratory	0	0	3	3	1.5
8	PCC	20ME207	Dynamics and Electrical Machines Laboratory	0	0	3	3	1.5
9	SC		Skill Oriented Course –II (Annexure-IV)	1	0	2	3	2
10	MC	20HUM901	Indian Constitution	2	0	0	2	0
Total				16	2	11	29	21.5

(L = Lecture, T = Tutorial, P = Practical)

B. Tech. Mechanical Engineering

III Year I Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	PCC	20ME109	Design of Machine Elements	2	1	0	3	3
2	PCC	20ME110	Manufacturing Technology-II	3	0	0	3	3
3	PCC	20ME111	Heat Transfer	2	1	0	3	3
4	OE		Open Elective-I (Annexure-II)	3	0	0	3	3
5	PE		Professional Elective-I (Annexure-III)	3	0	0	3	3
6	PCC	20ME208	Manufacturing Technology-II Laboratory	0	0	3	3	1.5
7	PCC	20ME209	Thermal Engineering Laboratory	0	0	3	3	1.5
8	SC		Skill Oriented Course-III (Annexure-IV)	1	0	2	3	2
9	MC	20CE901	Disaster Management	2	0	0	2	0
10	PROJ	20ME701	Summer Internship-I	0	0	3	3	1.5
Total				16	2	11	29	21.5

* 2 Months internship during 2nd year summer vacation and to be evaluated in III Year I Semester

III Year II Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	PCC	20ME112	CAD/ CAM	3	0	0	3	3
2	PCC	20ME113	Automation and Robotics	3	0	0	3	3
3	PCC	20ME114	Machine Learning for Mechanical Engineers	3	0	0	3	3
4	OE		Open Elective-II (Annexure-II)	3	0	0	3	3
5	PE		Professional Elective-II (Annexure-III)	3	0	0	3	3
6	PCC	20ME210	CAD/ CAM Laboratory	0	0	3	3	1.5
7	PCC	20ME211	Robotics Laboratory	0	0	3	3	1.5
8	PCC	20ME212	Engineering Metrology and Measurements Laboratory	0	0	3	3	1.5
9	SC		Skill Oriented Course-IV (Annexure-IV)	1	0	2	3	2
10	MC	20HUM902	Universal Human Values	2/3	0	0	2/3	0/3
Total				18/19	0	11	29/30	21.5/24.5

** 20HUM902 Universal Human Values is offered as non-credit mandatory course for 2020 (Regular) & 2021 (Lateral Entry) Admitted Batch

20HUM102 Universal Human Values is offered as three credit course for 2021 (Regular) & 2022(Lateral Entry) Admitted Batch onwards

(L = Lecture, T = Tutorial, P = Practical)

Tentative Curriculum Structure from IV Year Onwards

IV Year I Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	PE		Professional Elective-III (Annexure-III)	3	0	0	3	3
2	PE		Professional Elective-IV (Annexure-III)	3	0	0	3	3
3	PE		Professional Elective-V (Annexure-III)	3	0	0	3	3
4	OE		Open Elective-III (Annexure-II)	3	0	0	3	3
5	OE		Open Elective-IV (Annexure-II)	3	0	0	3	3
6	OE- HSMC		Open Elective-V (Taken from Humanities & Social Science) (Annexure-II)	3	0	0	3	3
7	SC		Skill Oriented Course-V (Annexure-IV)	1	0	2	3	2
8	PROJ	20ME702	Summer Internship-II*	0	0	6	6	3
Total				19	0	8	27	23

* 2 Months' internship during 3rd year summer vacation and to be evaluated in IV Year I Semester

IV Year II Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	PROJ	20ME703	Project Work, Seminar and Internship in Industry (6 months)	0	0	24	24	12
Total				0	0	24	24	12

(L = Lecture, T = Tutorial, P = Practical)

THREE WEEK MANDATORY INDUCTION PROGRAMME

- **Yoga and Meditation**
- **Sports and Games**
- **NSS**
- **NCC**
- **MITS Social Responsibility**
- **ClubManagement module**
- **Design Thinking**
- **Spoken and Written Communication**

➤ *Proficiency modules*

- Basic Computer Proficiency
- Interpersonal Skills
- Computer Graphics
- Web Programming
- Mobile Apps
- Vocabulary Enhancement

HOLISTIC DEVELOPMENT ACTIVITIES

Description of Activities

1. Physical and Health
2. Culture
3. Literature and Media
4. Social Service
5. Self-Development
6. Nature and Environment
7. Innovation

OPEN ELECTIVE – I			
(To be offered under MOOC's Category from SWAYAM – NPTEL)			
Sl. No.	Course Code	Course Title	Course Offered by Department of
1	20HUM3M01	Project Management for Managers	Management Studies
2	20HUM3M02	Ethics in Engineering Practice	Management Studies
3	20HUM3M03	E – Business	Management Studies
4	20CE3M01	Integrated Waste Management for Smart City	Civil
5	20CE3M02	Soil and Water Conservation Engineering	Civil
6	20CE3M03	Plastic Waste Management	Civil
7	20CE3M04	Safety in Construction	Civil
8	20EEE3M01	Non-Conventional Energy Sources	EEE
9	20EEE3M02	Design of Photovoltaic Systems	EEE
10	20ECE3M01	Microprocessors and Interfacing	ECE
11	20ECE3M02	Microprocessors and Microcontrollers	ECE
12	20ECE3M03	Semiconductor Opto-Electronics	ECE
13	20ECE3M04	Digital VLSI Testing	ECE
14	20CSE3M01	Online Privacy	CSE
15	20CSE3M02	Privacy and Security in Online Social Media	CSE
16	20CSE3M03	Computer Architecture	CSE
17	20CSE3M04	Computer Architecture and Organization	CSE
18	20IE3M01	Intellectual Property Rights and Competition Law	Multidisciplinary
19	20IE3M02	Introduction to Research	Multidisciplinary
20	20IE3M03	Roadmap for Patent Creation	Multidisciplinary
21	20IE3M04	Energy Conversion Technologies (Biomass And Coal)	Multidisciplinary
Any new Interdisciplinary Course offered by SWAYAM NPTEL can be appended in future.			

B. Tech. Mechanical Engineering

OPEN ELECTIVE – II			
(To be offered under Conventional Mode)			
Sl. No.	Course Code	Course Title	Course Offered by Department of
1	20MAT302	Engineering Optimization	Mathematics
2	20PHY301	Optical Physics and its Applications	Physics
3	20PHY302	LASER Physics and Advanced LASER Technology	Physics
4	20CHE301	Introduction to Petroleum Industry	Chemistry
5	20CHE302	Green Chemistry and Catalysis for Sustainable Environment	Chemistry
6	20CE301	Ground Improvement Techniques	Civil
7	20CE302	Environmental Impact Assessment	Civil
8	20CE303	Watershed Management	Civil
9	20EEE301	Industrial Electrical Systems	EEE
10	20EEE302	Introduction to MEMS	EEE
11	20ECE301	Bio-Medical Electronics	ECE
12	20ECE302	VLSI Design	ECE
13	20CST301	Operating Systems	CST
14	20CSE301	JAVA Programming	CSE
15	20CSE302	Multimedia Technologies	CSE

Any new Interdisciplinary courses can be appended in future.

B. Tech. Mechanical Engineering

OPEN ELECTIVE – III			
(To be offered under MOOC's Category from SWAYAM – NPTEL)			
Sl. No.	Course Code	Course Title	Course Offered by Department of
1	20HUM3M04	Management Information System	Management Studies
2	20CE3M05	Remote Sensing and GIS	Civil
3	20CE3M06	Wastewater Treatment and Recycling	Civil
4	20CE3M07	Building Materials And Composites	Civil
5	20EEE3M03	Introduction to Smart Grid	EEE
6	20EEE3M04	Transducers For Instrumentation	EEE
7	20ECE3M05	System Design Through Verilog	ECE
8	20CSE3M05	Software Testing	CSE
9	20CSE3M06	Multi-Core Computer Architecture – Storage and Interconnects	CSE
10	20CSE3M07	Introduction to Machine Learning	CSE
11	20CSE3M08	Fundamentals of Artificial Intelligence	CSE
12	20CST3M01	Ethical Hacking	CST
13	20IE3M05	Learning Analytics Tools	Multidisciplinary

Any new Interdisciplinary Course offered by SWAYAM NPTEL can be appended in future.

B. Tech. Mechanical Engineering

OPEN ELECTIVE – IV			
(To be offered under Conventional Mode)			
Sl. No.	Course Code	Course Title	Course Offered by Department of
1	20PHY303	Thin Film Technology and its Applications	Physics
2	20CHE303	Introduction to Nano Science and Technology	Chemistry
3	20CHE304	Computational Methods in Materials Science and Engineering	Chemistry
4	20CE304	Green Building and Energy Conservation	Civil
5	20CE305	Environmental Engineering	Civil
6	20EEE303	Robotics	EEE
7	20EEE304	Electrical Safety	EEE
8	20ECE303	Embedded Systems	ECE
9	20ECE304	DSP Architecture	ECE
10	20CSE303	Mobile Application Development	CSE
11	20CSE304	Software Project Management	CSE
12	20CST302	Distributed and Cloud Computing	CST
13	20CST303	Big Data Analytics	CST
Any new Interdisciplinary courses can be appended in future.			

B. Tech. Mechanical Engineering

OPEN ELECTIVE – V (HUMANITIES)			
(To be offered under Conventional Mode)			
Sl. No.	Course Code	Course Title	Course Offered by Department of
1	20HUM301	Principles of Management	Humanities
2	20HUM302	Human Resource Development	Humanities
3	20HUM303	Soft Skills	Humanities
4	20HUM304	National Cadet Corps	Humanities
Any new Interdisciplinary courses can be appended in future.			

List of Professional Electives

Professional Elective – I		
Sl. No.	Course Code	Course Title
1.	20ME401	Production Planning and Control
2.	20ME402	Computational Fluid Dynamics
3.	20ME403	Engineering Analysis and Computation
4.	20ME404	Fluid Power Systems
5.	20ME405	Finite Element Methods
6.	20ME406	Fundamentals of Automotive Engineering
Any advanced courses can be appended in future.		

Professional Elective – II		
(To be offered under MOOC's category from SWAYAM NPTEL)		
Sl. No.	Course Code	Course Title
1.	20ME4M01	Experimental Stress Analysis
2.	20ME4M02	System Design for Sustainability
3.	20ME4M03	Material Characterization
4.	20ME4M04	Design and Analysis of Experiments
5.	20ME4M05	Industrial Safety Engineering
6.	20ME4M06	Non-Conventional Energy Resources
7.	20ME4M07	Fundamental of Welding Science and Technology
8.	20ME4M08	Operations Management
Any other new Disciplinary Course offered by SMAYAM NPTEL which doesn't exist in the Curriculum can be appended in future.		

B. Tech. Mechanical Engineering

Professional Elective – III		
Sl. No.	Course Code	Course Title
1.	20ME407	Entrepreneurship and Project Management
2.	20ME408	Refrigeration and Air Conditioning
3.	20ME409	Internet of Manufacturing Things
4.	20ME410	Renewable Energy Systems
5.	20ME411	Nano Technology
Any advanced courses can be appended in future.		

Professional Elective – IV		
Sl. No.	Course Code	Course Title
1.	20ME412	Electric Vehicle Technology
2.	20ME413	Additive Manufacturing
3.	20ME414	Fundamentals of Aerodynamics
4.	20ME415	Non Destructive Testing
5.	20ME416	Total Quality Management
Any advanced courses can be appended in future.		

Professional Elective – V		
Sl. No.	Course Code	Course Title
1.	20ME417	Mechanical Vibrations
2.	20ME418	Gas Dynamics and Jet Propulsion
3.	20ME419	Manufacturing of Composite Materials
4.	20ME420	Power Plant Engineering
5.	20ME421	Operations Research
Any advanced courses can be appended in future.		

List of Skill Oriented Courses

Skill Oriented Course– I		
Sl. No.	Course Code	Course Title
1.	20ME601	Design Thinking and Product Innovation

Skill Oriented Course– II		
Sl. No.	Course Code	Course Title
1.	20ENG601	Corporate Communication
Any advanced courses can be appended in future.		

Skill Oriented Course– III		
Sl. No.	Course Code	Course Title
1	20ME602	Computer Modeling for Mechanical Engineering-I
Any advanced courses can be appended in future.		

Skill Oriented Course– IV		
Sl. No.	Course Code	Course Title
1.	20ME603	Computer Modeling for Mechanical Engineering-II
Any advanced courses can be appended in future.		

Skill Oriented Course– V		
Sl. No.	Course Code	Course Title
1.	20ME604	Advanced Manufacturing Technologies
Any advanced courses can be appended in future.		

Minor in Mechanical Engineering

(Applicable to CE, EEE, ECE, CSE, CST, CS – AI, CS – DS, CS – CSY & CS - IOT)

Stream Name: Digital Manufacturing

Sl. No	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact	
III Year I Semester								
1	Professional Core Course	20MDME101	Computer Aided Manufacturing Process	3	0	0	3	3
2	Professional Core Course	20MDME102	Product Design and Development	3	0	0	3	3
III Year II Semester								
3	Professional Core Course	20MDME103	Digital Manufacturing Planning and Control	3	0	0	3	3
4	Professional Core Course	20MDME104	Big Data Analytics for Manufacturing	3	0	0	3	3
5	Professional Core Course	20MDME201	Computer Aided Design and Manufacturing Laboratory	0	0	4	4	2
IV Year I Semester								
6	Professional Core Course	20MDME105	Smart Sensors and Industry 4.0	3	0	0	3	3
7	Professional Core Course	20MDME106	Lean Manufacturing	3	0	0	3	3
Total				18	0	4	22	20

B. Tech. Mechanical Engineering

Minor in Mechanical Engineering

(Applicable to CE, EEE, ECE, CSE, CST, CS – AI, CS – DS, CS – CSY & CS - IOT)

Stream Name: Energy Engineering

Sl. No	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact Hours	
III Year I Semester								
1	Professional Core Course	20MDME107	Fluid Mechanics and Hydraulic Machinery	2	1	0	3	3
2	Professional Core Course	20MDME108	Applied Thermodynamics	2	1	0	3	3
III Year II Semester								
3	Professional Core Course	20MDME109	Heat Transfer	2	1	0	3	3
4	Professional Core Course	20MDME110	Computational Fluid Dynamics	2	1	0	3	3
5	Professional Core Course	20MDME202	Thermal Engineering Laboratory	0	0	4	4	2
IV Year I Semester								
6	Professional Core Course	20MDME111	Design of Gas Turbine Engines	2	1	0	3	3
7	Professional Core Course	20MDME112	Fluid Power System	2	1	0	3	3
Total				12	6	4	22	20

Honors in Mechanical Engineering

Sl. No	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact	
III Year I Semester								
1	Professional Elective Course (Choose any two from three courses)	20HDME101	Advanced Welding Technology	3	0	0	3	3
2		20HDME102	Design and Analysis of Welded Structures	3	0	0	3	3
3		20HDME103	Combustion and Emissions	3	0	0	3	3
Sub				6	0	0	6	6
III Year II Semester								
4	Professional Elective Course (Choose any two from three courses)	20HDME104	Ergonomics	3	0	0	3	3
5		20HDME105	Solar Energy for Process Heat and Power Generation	3	0	0	3	3
6		20HDME106	Fracture Mechanics	3	0	0	3	3
Sub				6	0	0	6	6
IV Year I Semester								
7	Professional Elective Course (Choose any two from three)	20HDME107	Powder Metallurgy	3	0	0	3	3
8		20HDME108	Advanced Fluid Mechanics	3	0	0	3	3
9		20HDME109	Modelling of SI and CI Engines	3	0	0	3	3
10	SOC	20HDME601	Simulation and Analysis using ANSYS	1	0	2	3	2
Sub Total				7	0	2	9	8
Total				19	0	2	21	20