MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE

(UGC AUTONOMOUS INSTITUTION)
Accredited by NBA & NAAC, Approved by AICTE & Affiliated to JNTU-Anantapur
An ISO 21001-2018 Certified Institution

DEPARTMENT OF MECHANICAL ENGINEERING

Date: 04-07-2025

COMPOSITION AND APPROVAL OF BOARD OF STUDIES (BoS)

The following members are nominated and approved for constitution of Board of Studies (BoS).

Sl. No.	Member	Designation
1.	**Dr. S. Baskaran** (Chairman & Subject Expert – Manufacturing)	Assoc. Professor & Head of the Department, ME
2.	**Dr. B. Durga Prasad** (JNTUA University Nominee)	Professor, Mechanical Engineering, JNTU, Ananthapuramu.
3.	**Dr. V. Anandakrishnan** (Academic Expert)	Professor, Production Engineering, NIT, Trichy.
4.	**Dr. E. Anil Kumar** (Academic Expert)	Professor, Mechanical Engineering, IIT, Tirupati.
5.	**Mr. Kashinath M Patnasetty** (Industry Expert)	Head, VAS Application Support, Ace Designers Limited, Bengaluru.
6.	**Mr. K. Khadhar Valli Basha** (Alumni & Industry Expert)	Senior CAE Analyst, Caterpillar, Bengaluru.
7.	**Dr. P. Sivaiah** (Subject Expert - Manufacturing)	Assoc. Professor & Associate Dean R&D, MITS.
8.	**Dr. Anantha Ramar L.** (Subject Expert – Thermal)	Assistant Professor & Academic & NBA Coordinator, ME, MITS
9.	**Dr. Manish Sharma** (Subject Expert – Thermal)	Assistant Professor & NBA Co-Coordinator, MITS.
10.	**Dr. Jagesh Kumar Prusty** (Subject Expert – Design)	Assistant Professor & Student Activities Coordinator, ME, MITS.
11.	**Dr. Gejendhiran S.** (Subject Expert – Design)	Assistant Professor & NEP Co-Coordinator, MITS.

Dr. S. Baskaran
Chairman BoS,
Assoc. Professor & Head,
Department of ME, MITS

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

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DEPARTMENT OF MECHANICAL ENGINEERING

CIRCULAR

Date: 07-07-2025

It is hereby informed to all the faculty members that **Board of Studies (BoS)** meeting is scheduled on 14-07-2025 at 02:00 pm (Online Mode) for the below mentioned agenda.

Agenda:

1. Implementation of NEP 2020 Initiatives
    a. National Credit Framework (NCrF)
    b. Indian Knowledge System (IKS) courses as Elective
    c. Pursuing Two academic programs simultaneously
    d. Courses in Bharatiya Bhasha Language
2. Regulations 2023 Course Structure and Syllabus for 3-1 and 3-2 Semesters
3. Syllabus of Minor and Honors Programs

Meeting Link:
https://teams.microsoft.com/l/meetup-join/19%3ameeting_OGUwMWEwYTQtMWEzZi00NDVkLWE5ZTgtZmZjNjM0ZjFhMDRl%40thread.v2/0?context=%7b%22Tid%22%3a%22b637c4f6-57b7-44dc-bce4-fec0cd202460%22%2c%22Oid%22%3a%228d1d9056-9ba8-4186-b8a9-767e2f972157%22%7d

The following BoS members are requested to attend the meeting.

Sl. No.	Member	Designation
1.	**Dr. S. Baskaran** (Chairman & Subject Expert – Manufacturing)	Assoc. Professor & Head of the Department, ME
2.	**Dr. B. Durga Prasad** (JNTUA University Nominee)	Professor, Mechanical Engineering, JNTU, Ananthapuramu.
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Dr. S. Baskaran
Chairman-BoS,
Assoc. Professor & Head,
Department of ME, MITS

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

Date: 15-07-2025

Board of Studies (BoS)
Minutes of meeting held on 14-07-2025, 02:00 PM – 04:00 PM & Action taken report.
Microsoft Teams (Online Meeting)

Agenda:

1. Implementation of NEP 2020 Initiatives
    a. National Credit Framework (NCrF)
    b. Indian Knowledge System (IKS) courses as Elective
    c. Pursuing Two academic programs simultaneously
    d. Courses in Bharatiya Bhasha Language
2. Regulations 2023 Course Structure and Syllabus for 3-1 and 3-2 Semesters
3. Syllabus of Minor and Honors Programs

Minutes:

1. The Head of the Department, Dr. S. Baskaran welcomed all members to the BOS meeting.
2. Dr. S. Baskaran introduced external members to the participants.
3. Dr. S. Baskaran introduced internal members to the participants.
4. Dr. S. Baskaran presented an overview of the institution, department, recent activities, and achievements.
5. Dr. S. Baskaran presented the agenda of the BOS meeting.
6. Dr. S. Baskaran presented the NEP 2020 initiatives to the BOS members and explained the following:
    a. National Credit Framework (NCrF) - Program Duration & Exit Options, Curriculum Highlights, Skill Integration, Credit Mapping, Academic Bank of Credits (ABC) and Credit Distribution.
    b. Indian Knowledge System (IKS) course as Open Elective I (23HUM301)
    c. Pursuing Two academic programs simultaneously – Students are permitted to pursue a simultaneous B.S. degree through online programs offered by premier institutions such as IITs, IISc, and NITs, subject to the respective university norms and eligibility criteria.
    d. Courses in Bharatiya Bhasha Language - 23CSE3M01 - Human Computer Interaction (Hindi), 23MAT3M02 - Foundations of R Software (Hindi).
7. Members unanimously approved all the above-mentioned initiatives pertaining NEP 2020.
8. Dr. S. Baskaran presented the course structure of R23 Regulations to the members.

9. The course structure for 3-1 & 3-2 semesters are mentioned below:

R23 - Curriculum Structure
III Year I Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	PCC	23ME109	Manufacturing Technology II	3	0	0	3	3
2	PCC	23ME110	Heat Transfer	2	1	0	3	3
3	PCC	23ME111	Metrology and Measurements	3	0	0	3	3
4			Introduction to Quantum Technology and Applications	3	0	0	3	3
5	PE		**Professional Elective - I** *(ANNEXURE - IV)*	3	0	0	3	3
6	OE		**Open Elective - I** *(ANNEXURE - III)*	3	0	0	3	3
7	PCC	23ME207	Heat Transfer Laboratory	0	0	3	3	1.5
8	PCC	23ME208	Machine Tools and Metrology Laboratory	0	0	3	3	1.5
9	SEC		**Skill Enhancement Course – III** *(Refer ANNEXURE - VI)*	1	0	2	3	2
10	ESC	23ECE501	Tinkering Laboratory	0	0	2	2	1
11	PROJ	23ME701	Summer Internship I	0	0	4	4	2
Total				**18**	**1**	**14**	**33**	**26**

III Year II Semester

S. No.	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total	
1	PCC	23ME112	Thermal Engineering	2	1	0	3	3
2	PCC	23ME113	CAD/CAM	3	0	0	3	3
3	PCC	23ME114	Design of Machine Elements	2	1	0	3	3
4	PE		**Professional Elective - II** *(ANNEXURE - IV)*	3	0	0	3	3
5	PE		**Professional Elective-III** *(Annexure - IV)*	3	0	0	3	3
6	OE		**Open Elective – II** *(ANNEXURE - III)*	3	0	0	3	3
7	PCC	23ME209	Thermal Engineering Laboratory	0	0	3	3	1.5
8	PCC	23ME210	CAD/CAM Laboratory	0	0	3	3	1.5
9	SEC		**Skill Enhancement Course – IV** *(Refer ANNEXURE - VI)*	1	0	2	3	2
10	AUC	23CHE901	Environmental Science	2	0	0	2	-
Total				**19**	**2**	**8**	**29**	**23**

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

10. The members approved the course structure pertaining to III-year B.Tech. Mechanical Engineering under R23 Regulations.
11. The members suggested to improve the interview speaking skills of students from 3rd year onwards. Students can be trained in 5 to 6 specific topics they like and they should be made capable of presenting what they now in the best way.

12. Dr. S. Baskaran handed over the session to Dr. Anantha Raman L., Academic Coordinator for detailed discussion of syllabus of each course offered by ME dept.
13. Dr. Anantha Raman L. presented the syllabus of each course in 3-1 semester in detail.
14. 23ME109 Manufacturing Technology II:
    - Members suggested to add hard machining, high speed machining in UNIT III, resource management, consumables management, economics in non-conventional machining in UNIT IV. Also include one-page simple case studies on different manufacturing processes.
    - All suggestions given by the members were implemented.
15. 23ME110 Heat Transfer:
    - Members suggested to move unit 5 to unit 2 position and they suggested not to mention the software / platform name and suggested to mention generic technologies / stack.
    - Members suggested to add case studies on eligible topics and if possible 2D problems.
    - All suggestions given by the members were implemented.
16. 23ME111 Metrology and Measurements:
    - Members suggested to include process capability, non-contact measurements related topics in the syllabus. They also suggested to include latest web links related to the course in the reference sections.
    - All suggestions given by the members were implemented.
17. 23ME301 (OE1) Materials Science for Engineers:
    - Members suggested to add classification of materials along with composites under unit 4. Also, they suggested to connect materials with applications.
    - All suggestions given by the members were implemented.
18. 23ME302 (OE1) Sustainable Energy Technologies:
    - All members accepted and appreciated the syllabus as it is.
19. 23ME207 Heat Transfer Laboratory:
    - Members suggested to implement the effect on heat in industrial machines as a case study experiment if possible.
    - All suggestions given by the members were implemented.
20. 23ME208 Machine Tools and Metrology Laboratory:
    - Members suggested to add Experiments related to artifacts on length, OD, ID, Fillet, Chamfers etc.,
    - All suggestions given by the members were implemented.
21. 23ME601 (SEC) Machine Dynamics and Mechanical Vibrations:
    - All members accepted the syllabus as it is.
22. Dr. Anantha Raman L. presented the syllabus of each course in 3-2 semester in detail.
23. 23ME112 Thermal Engineering:
    - All members accepted the syllabus as it is.
24. 23ME113 CAD/CAM:

- All members accepted the syllabus as it is.

25. 23ME114 Design of Machine Elements:
    - Members suggested to include latest technologies and software, solvers related to different design processes.
    - All suggestions given by the members were implemented.
26. 23ME401 (PE2) Refrigeration and Air Conditioning:
    - All members accepted the syllabus as it is.
27. 23ME402 (PE2) Renewable Energy Systems:
    - All members accepted the syllabus as it is.
28. 23ME403 (PE2) Non-Destructive Testing:
    - All members accepted the syllabus as it is.
29. 23ME404 (PE2) Introduction to Composites:
    - Members suggested to include a topic on additive manufacturing of composites.
    - All suggestions given by the members were implemented.
30. 23ME405 (PE3) Operations Research
    - Members suggested to change unit 2 title to "Transportation Models".
    - All suggestions given by the members were implemented.
31. 23ME406 (PE3) Automation and Robotics:
    - Members suggested to add more applications in unit 5.
    - All suggestions given by the members were implemented.
32. 23ME407 (PE3) Finite Element Methods:
    - All members accepted the syllabus as it is.
33. 23ME408 (PE3) Electric and Hybrid Vehicle Technology:
    - All members accepted the syllabus as it is.
34. 23ME209 Thermal Engineering Laboratory:
    - All members accepted the syllabus as it is.
35. 23ME210 CAD/CAM Laboratory:
    - All members accepted the syllabus as it is.
36. 23ME602 (SEC) Robotics and 3D Printing:
    - All members accepted the syllabus as it is.
37. Dr. Anantha Raman L. handed the session to Dr. S. Baskaran to present the R23 Honor & Minor Course Structure and Syllabus of each course along with the department's vision and mission.
38. Dr. S. Baskaran presented the course structure of R23 Honors as displayed below:

Minors in Mechanical Engineering

(Applicable to CE, EEE, ME, CSE, CST, CSE (AI), CSE (DS), CSE (CS), CSE (AI and ML) and CSE (Networks))

Stream Name: Thermal Engineering

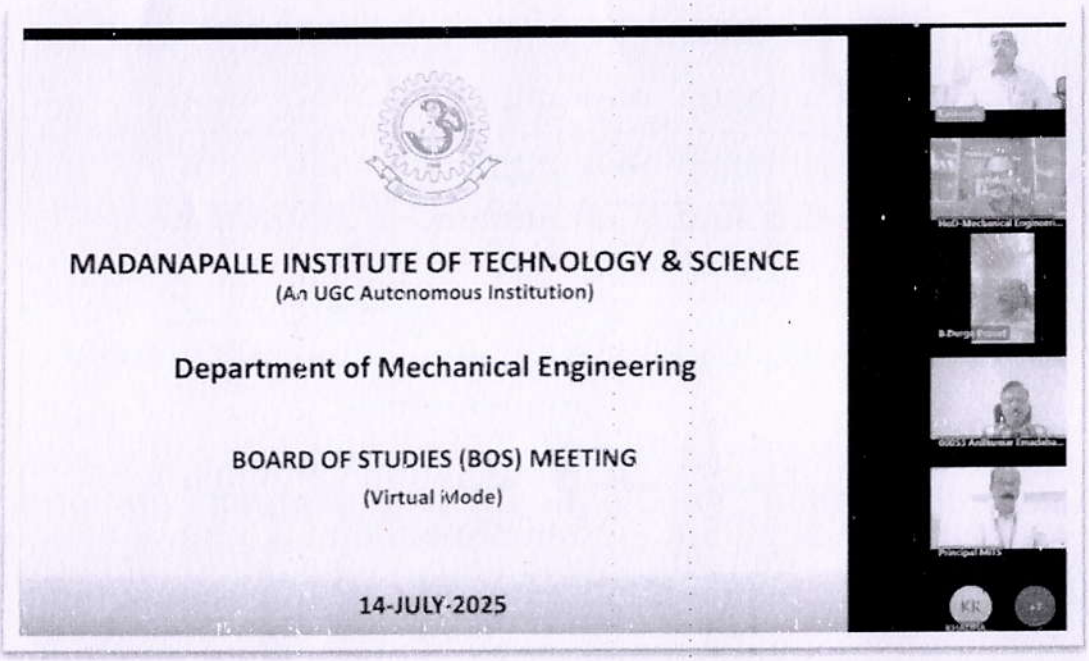
Sl. No	Category	Course Code	Course Title	Hours Per Week				Credits
				L	T	P	Total Contact Hours	
III Year I Semester								
1	Professional Core Course	23MDME101	Fluid Mechanics and Hydraulic Machinery	2	1	0	3	3
2	Professional Core Course	23MDME102	Applied Thermodynamics		1	0	3	3
3	Professional Core Course	23MDME201	Fluid Mechanics and Hydraulic Machinery Laboratory		0	3	3	1.5
III Year II Semester								
3	Professional Core Course	23MDME103	Heat Transfer	2	1	0	3	3
4	Professional Core Course	23MDME104	Computational Fluid Dynamics	2	1	0	3	3
5	Professional Core Course	23MDME202	Thermal Engineering Laboratory	0	0	3	3	1.5
IV Year I Semester								
6	Professional Core Course	23MDME105	Design of Gas Turbine Engines	2	1	0	3	3
			Total	10	5	6	21	18

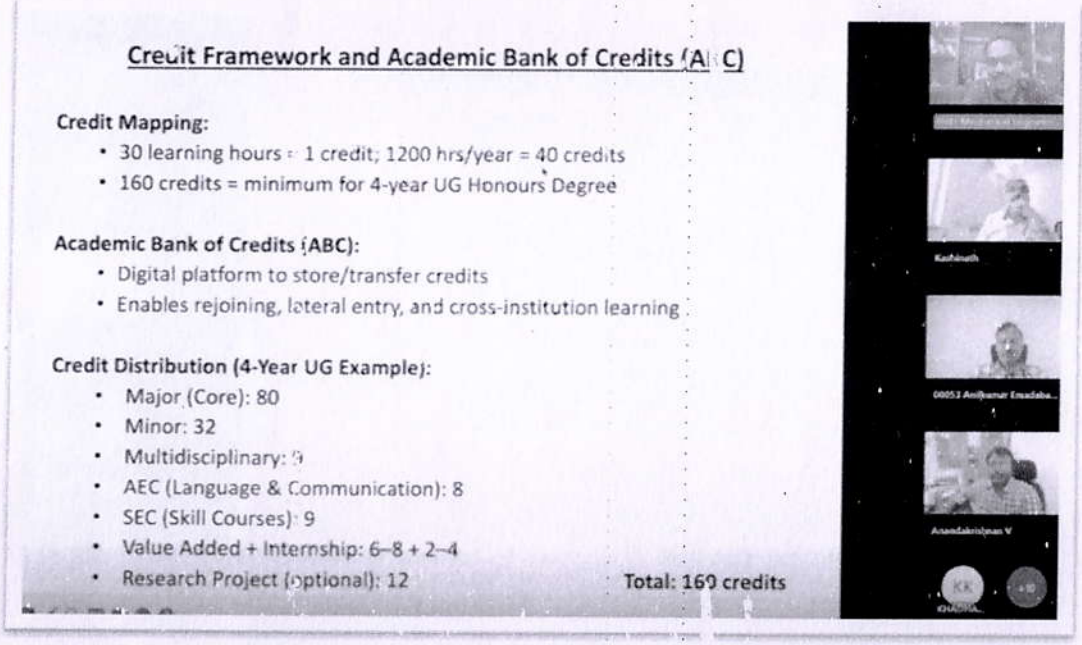
39. Dr. S. Baskaran presented the R23 Minor course structure as displayed below:

Honors in Mechanical 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	23HDME101	Advanced Welding Technology	3	0	0	3	3
2	Professional Core Course	23HDME102	Product Design Development	3	0	0	3	3
3	Professional Core Course	23HDME201	Advanced Welding Laboratory	0	0	3	3	1.5
III Year II Semester								
4	Professional Core Course	23HDME103	Refrigeration System Design	3	0	0	3	3
5	Professional Core Course	23HDME104	Industrial Tribology and Surface Engineering	3	0	0	3	3
6	Professional Core Course	23HDME202	Advanced Manufacturing Technology Laboratory	0	0	3	3	1.5
IV Year I Semester								
7	Professional Core Course	23HDME105	Rocket and Space Propulsion	3	0	0	3	3
			Total	15	0	6	21	18

40. Dr. S. Baskaran presented the syllabus of each course under honors and minors.
41. All members accepted the syllabus contents as it is.
42. Dr. S. Baskaran presented the department's vision and mission.
43. All members appreciated the vision and mission statement's and advised to discuss the same with students and faculty. The members suggested to update the vision statement to "preferred centre of excellence" if possible.
44. Dr. S. Baskaran concluded the meeting and thanked all the members for attending and contributing to the improvement of the curriculum and syllabus.
45. The revised course-wise syllabus of all R-23 3-1 & 3-2 courses, honors and minor has been attached with the minutes for reference.
46. A few screenshots of the online meeting are displayed below:





Credit Framework and Academic Bank of Credits (ABC)

Credit Mapping:

- 30 learning hours = 1 credit; 1200 hrs/year = 40 credits
- 160 credits = minimum for 4-year UG Honours Degree

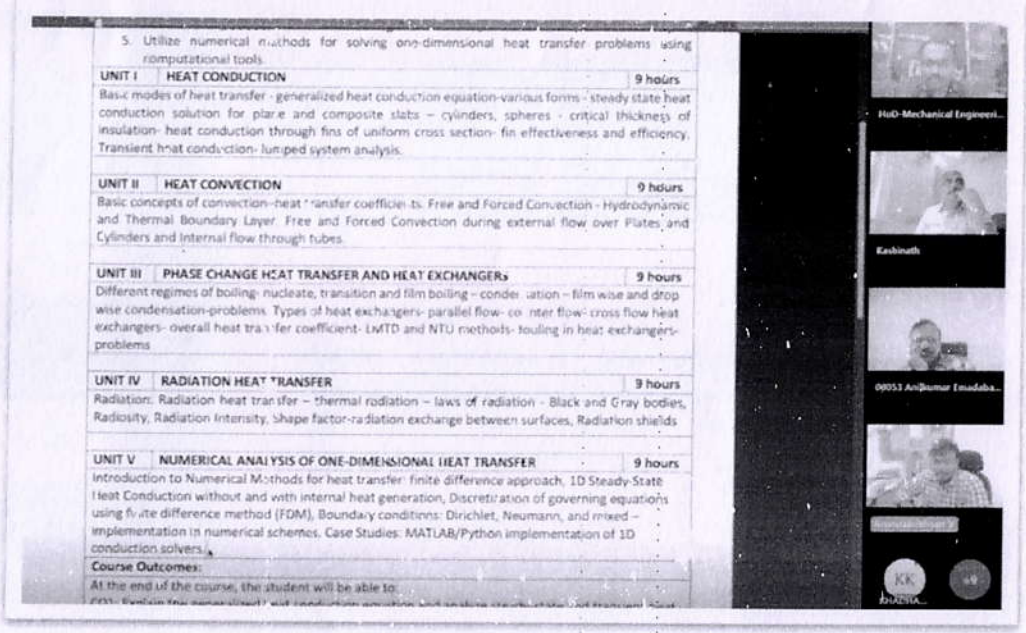
Academic Bank of Credits (ABC):

- Digital platform to store/transfer credits
- Enables rejoining, lateral entry, and cross-institution learning

Credit Distribution (4-Year UG Example):

- Major (Core): 80
- Minor: 32
- Multidisciplinary: 9
- AEC (Language & Communication): 8
- SEC (Skill Courses): 9
- Value Added + Internship: 6–8 + 2–4
- Research Project (optional): 12

Total: 160 credits



5. Utilize numerical methods for solving one-dimensional heat transfer problems using computational tools.

UNIT I	HEAT CONDUCTION	9 hours

Basic modes of heat transfer - generalized heat conduction equation-various forms - steady state heat conduction solution for plane and composite slabs – cylinders, spheres - critical thickness of insulation- heat conduction through fins of uniform cross section- fin effectiveness and efficiency. Transient heat conduction- lumped system analysis.

UNIT II	HEAT CONVECTION	9 hours

Basic concepts of convection–heat transfer coefficients. Free and Forced Convection - Hydrodynamic and Thermal Boundary Layer. Free and Forced Convection during external flow over Plates and Cylinders and Internal flow through tubes.

UNIT III	PHASE CHANGE HEAT TRANSFER AND HEAT EXCHANGERS	9 hours

Different regimes of boiling- nucleate, transition and film boiling – condensation – film wise and drop wise condensation-problems. Types of heat exchangers- parallel flow- counter flow- cross flow heat exchangers- overall heat transfer coefficient- LMTD and NTU methods- fouling in heat exchangers- problems

UNIT IV	RADIATION HEAT TRANSFER	9 hours

Radiation: Radiation heat transfer – thermal radiation – laws of radiation - Black and Gray bodies, Radiosity, Radiation Intensity, Shape factor-radiation exchange between surfaces, Radiation shields

UNIT V	NUMERICAL ANALYSIS OF ONE-DIMENSIONAL HEAT TRANSFER	9 hours

Introduction to Numerical Methods for heat transfer: finite difference approach, 1D Steady-State Heat Conduction without and with internal heat generation, Discretization of governing equations using finite difference method (FDM), Boundary conditions: Dirichlet, Neumann, and mixed – implementation in numerical schemes. Case Studies: MATLAB/Python implementation of 1D conduction solvers.

Course Outcomes:

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

Honors in Mechanical Engineering

Sl.No	Category	Course Code	Course Title	Hours Per Week L	T	P	Total Contact Hours	Credits
			III Year I Semester					
1	Professional Core Course	21HOME301	Advanced Welding Technology	3	0	0	3	3
2	Professional Core Course	21HOME302	Product Design Development	3	0	0	3	3
3	Professional Core Course	21HOME303	Advanced Welding Laboratory	0	0	3	3	1.5
			III Year II Semester					
4	Professional Core Course	21HOME351	Refrigeration System Design	3	0	0	3	3
5	Professional Core Course	21HOME304	Industrial Tribology and Surface Engineering	3	0	0	3	3
6	Professional Core Course	21HOME352	Advanced Manufacturing Technology Laboratory	0	0	3	3	1.5
			IV Year I Semester					
7	Professional Core Course	21HOE-E305	Rocket and Space Propulsion	3	0	0	3	3
			Total	15	0	6	21	18



Department Vision

"To be a Centre of Excellence in the field of Mechanical Engineering to generate quality human resource in mechanical engineering who can contribute constructively to the technological and socio-economic development of the Nation."



Approval:

The above-mentioned meeting minutes have been approved by the following members of the Board of Studies (BOS).

Sl. No.	Member	Designation	Signature
1.	**Dr. S. Baskaran** (Chairman & Subject Expert – Manufacturing)	Assoc. Professor & Head of the Department, ME	
2.	**Dr. B. Durga Prasad** (JNTUA University Nominee)	Professor, Mechanical Engineering, JNTU, Ananthapuramu.	Approval via email
3.	**Dr. V. Anandakrishnan** (Academic Expert)	Professor, Production Engineering, NIT, Trichy.	Approval via email
4.	**Dr. E. Anil Kumar** (Academic Expert)	Professor, Mechanical Engineering, IIT, Tirupati.	Approval via email
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10.	**Dr. Jagesh Kumar Prusty** (Subject Expert – Design)	Assistant Professor & Student Activities Coordinator, ME, MITS.	18.07.2024
11.	**Dr. Gejendhiran S.** (Subject Expert – Design)	Assistant Professor & NEP Co-Coordinator, MITS.	

Dr. S. Baskaran
Assoc. Professor & Head,
Department of ME – MITS

Dr. C. Yuvaraj
Principal, MITS

PRINCIPAL
Madanapalle Institute of
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MADANAPALLE

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