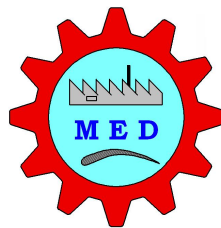


**M. Tech: Machine Design
(2021 - 23)**

**Scheme of Teaching and Examination &
Syllabus**



**Department of Mechanical Engineering
The National Institute of Engineering, Mysuru**

**CURRICULUM
&
SYLLABUS**

THE NATIONAL INSTITUTE OF ENGINEERING

VISION

NIE will be a globally acknowledged Institution providing value-based technical and scientific education through best-in-class talent.

DEPARTMENT OF MECHANICAL ENGINEERING

VISION

The Department of Mechanical Engineering will mould globally competent engineers by imparting value based technological education through contemporary infrastructure & best in class people.

MISSION

Department of Mechanical Engineering is committed to:

1. Provide a strong foundation in mechanical engineering to make our engineers globally competitive.
2. Inculcate creativity in developing solutions to mechanical engineering problems by adopting ethical and responsible engineering practices.
3. Creating centres of Excellence to provide students with opportunities to strengthen their leadership & entrepreneurial skills and research proficiency.

PROGRAMME EDUCATIONAL OBJECTIVES

- Graduates will have successful careers as design engineers in Mechanical and allied industry
- Graduates will be able to pursue advanced studies and involve in a process of lifelong learning.
- Graduates will address societal problems professionally, ethically with due attention to environmental issues.

GRADUATE ATTRIBUTES

1. Engineering Knowledge
2. Problem Analysis
3. Design/Development of Solutions
4. Conduct Investigations of complex problems
5. Modern tools usage
6. Engineer and Society
7. Environment and Sustainability
8. Ethics
9. Individual & Team work
10. Communication
11. Project management & Finance
12. Lifelong learning

PROGRAMME OUTCOMES

After the completion of two year post-graduate programme in Machine Design, Graduates are expected to acquire the abilities to:

- PO1.** Independently carry out research/investigation and development work to solve practical problems in Machine Design.
- PO2.** Write and present a substantial technical report/document.
- PO3.** Demonstrate a degree of mastery over Machine Design.
- PO4.** Acquire in-depth knowledge in Machine Design with hands on skill in using modern engineering tools to address real world engineering problems and be socially responsible.
- PO5.** Employ modern engineering, management and financial tools to cater to the needs of the community.

PROGRAMME SPECIFIC OUTCOMES

At the end of the programme, the students will be able to

- PSO1.** Attain the ability to apply the fundamental knowledge of Machine Design in synthesis, analysis, design and development of components/machines using modern engineering tools.
- PSO2.** Independently carryout research to find out effective solutions to real life problems pertaining to Machine Design and allied domain and to prepare technical reports.

DEPARTMENT OF MECHANICAL ENGINEERING							
SCHEME OF TEACHING AND EXAMINATION							
I SEMESTER							
Sl. No.	Subject Code	Subject	Dept./ Board	L	T	P	Credits
01	APM1C01	Applied Mathematics	Mathematics	4	0	0	4
02	MMD1C01	Finite Element Method	Mechanical	4	0	2	5
03	MMD1C02	Composites Materials Technology	Mechanical	4	0	2	5
04	MMD1C03	Theory of Elasticity	Mechanical	3	2	0	4
05	MMD1E1XX	Elective I	Mechanical	3	0	0	3
06	MMD1E2XX	Elective – II	Mechanical	3	0	0	3
07	MMD1CRM	Research Methodology	Mechanical	2	0	0	2
08	MMD1L01	Design Laboratory-I	Mechanical	0	0	2	1
Total				31			27

C - Core, E - Elective, L - Laboratory

Elective I			
MMD1E101	Computer Applications in Design	MMD1E103	Product Design
MMD1E102	Experimental Stress Analysis		

Elective II			
MMD1E201	Robotics for Industrial Automation	MMD1E204	Optimum Design of Mechanical Elements
MMD1E202	Theory of Plates & Shells		

DEPARTMENT OF MECHANICAL ENGINEERING							
SCHEME OF TEACHING AND EXAMINATION							
II SEMESTER							
Sl. No.	Subject Code	Subject	Dept./ Board	L	T	P	Credits
01	MMD2C01	Fatigue Analysis	Mechanical	4	2	0	5
02	MMD2C02	Tribology and Bearing Design	Mechanical	4	2	0	5
03	MMD2C03	Advanced Theory of Vibrations	Mechanical	3	2	0	4
04	MMD2C04	Mechanisms Design	Mechanical	3	0	2	4
05	MMD2E3XX	Elective-III	Mechanical	3	0	0	3
06	MMD2E4XX	Elective-IV	Mechanical	3	0	0	3
07	MMD2IXX	Industry Driven Elective	Industry	2	0	0	2
08	MMD2L01	Design Laboratory-II	Mechanical	0	0	2	1
Total					32		27

C – Core, E - Elective, I - Industry Driven Elective

Elective III			
MMD2E301	Fracture Mechanics	MMD2E303	Theory of Plasticity
MMD2E302	Rotor Dynamics		

Elective IV			
MMD2E401	Design of Experiments and Robust Design	MMD2E404	Engineering Mechanics-Dynamics
MMD2E402	Design of Pressure Vessels		

Industry Driven Elective	
MMD2I01	Modal Testing

DEPARTMENT OF MECHANICAL ENGINEERING							
SCHEME OF TEACHING AND EXAMINATION							
III SEMESTER							
Sl. No.	Subject Code	Subject	Dept./ Board	L	T	P	Credits
01	MMD3MXX	MOOC Elective (Management Stream) 12 weeks course.	SWAYAM	-	-	-	3
02	MMD3MOXX	Open MOOC Elective (Any stream) 8 weeks course.	SWAYAM	-	-	-	2
03	MMD3C02	Seminar/Paper presentation.	Mechanical	0	0	0	1
04	MMD3C06	Internship (for 8 Weeks) (At the end of the internship, students are required to submit a report and present a Seminar).	Mechanical	0	0	0	5
05	MMD3C05	Project Phase – I (Students have to initiate the project work and at the end of the semester, they should present a progress seminar).	Mechanical	0	0	0	8
Total Credits							19

DEPARTMENT OF MECHANICAL ENGINEERING						
SCHEME OF TEACHING AND EXAMINATION						
IV SEMESTER						
Sl. No.	Subject Code	Subject	L	T	P	Credits
01	MMD4C01	Project Phase – II (Students have to submit the final project report at the end of the semester which will be evaluated followed by a seminar presentation and viva – voce examination).	0	0	0	15
Total Credits						15

Credit Structure

Core Courses	33
Elective Courses	12
Open elective through SWAYAM	02
Industry Driven Elective	02
Research Methodology	02
Credit for Engg. Management, Engg. Economics, Financial Management and Ethics through SWAYAM	03
Seminars, Project Phase-I & Internship	14
Lab components	05
Major Project	15
Total	88