

**Course Structure & Syllabus**  
**IV Year BE (Mechanical Engineering)**



ESTD : 1946

**Department of Mechanical Engineering**  
**National Institute of Engineering**

**Academic Year 2020 - 21**

## **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**

The Department of Mechanical Engineering is committed to:

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

### **Programme Educational Objectives**

The Department of Mechanical Engineering, NIE, has formulated the following programme educational objectives for the under-graduate program in Mechanical Engineering:

Our graduates will:

1. Be successful in their careers as Mechanical Engineers in a globally competitive industrial arena.
2. Pursue higher education, research and development and other creative and innovative efforts in mechanical engineering.
3. Demonstrate leadership qualities and professionalism in their chosen field of specialization.
4. Be socially and ethically responsible for sustainable development.

### **Programme Specific Outcomes**

1. Applying interdisciplinary engineering knowledge and skills in order to fit into core mechanical engineering as well as information technology and management positions in any organization.
2. Designing & building environmentally friendly systems by harnessing renewable energy.
3. Analyzing and solving engineering design problems by hands on application of

knowledge & skills

4. Comprehend and convey technical information using modern communication tools.

#### **Programme Outcomes**

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend

and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Scheme of teaching, examination, and Syllabus of VII& VIII Semester B.E. degree**

(for batch admitted in the year 2017-18)

**VII Semester**

Sl. No.	Course Code	Course	Category	L	T	P	Credits	Hrs/ week
1	ME0308	Operations Management	FCM	3	0	0	3	3
2	ME0453	Control Engineering	FCD	3	2	0	4	5
3	ME0427	Renewable Energy Technologies	FCT	3	0	2	4	5
4	ME0201	Research Methodology	GC	2	0	0	2	2
5	ME03XX	Elective – III	E	3	0	0	3	3
6	ME03XX	Elective – IV	E	3	0	0	3	3
7	ME0110	Heat Transfer Laboratory	FCT	0	0	3	1.5	3
8	ME0107	Thermodynamics & IC Engines Laboratory	FCT	0	0	3	1.5	3
9	ME0118	Project Work Phase I	-	0	0	2	1	2
10	ME01XX	Elective-V	-	-	-	-	1	-
<b>Total</b>							<b>24</b>	<b>29</b>

<b>Elective III &amp; IV – 3 Credits</b>					
ME0315	Aeronautical Engineering	FET	ME0304	Tribology & Bearing Design	FED
ME0316	IC Engines	FET	ME0305	Industrial Robotics	FEP
ME0317	Industrial Design & Ergonomics	FEP	ME0329	Additive Manufacturing	FEP
ME0325	Advanced Nano Sciences and Technology	GE	ME0318	Aerodynamics	FET

<b>Elective V – 1 Credit</b>			
ME0115	Internship	ME0116	Aptitude Training

**VIII Semester**

Course Structure & Syllabus of IV Year for the Academic Year 2020-21

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Sl. No.	Course Code	Subject	Category	L	T	P	Credits	Hrs/ week
1	ME0327	Computer Integrated Manufacturing	FCP	3	0	0	3	3
2	ME0426	Fluid Power Systems	FCP	4	0	0	4	4
3	ME03XX	Elective VI	E	3	0	0	3	3
4	ME0112	Seminar	-	0	0	2	1	2
5	ME0601	Project Work	-	0	0	6	6	12
<b>Total</b>							<b>17</b>	<b>24</b>

Elective VI – 3 Credits		
ME0319	Automotive Engineering	FET
ME0320	Total Quality Management	FEM
ME0321	Biomass Energy Systems	FET
ME0322	Quality by Design	FEP
ME0323	Statistical Quality Control	FEP
ME0326	Design of Aircraft Structures	FED

C	Core
GC	General Core
FCP	Foundation Core – Production
FCT	Foundation Core – Thermal
FCD	Foundation Core – Design
FCM	Foundation Core – Management
E	Elective
GE	General Elective
OE	Open Elective
FEP	Foundation Elective – Production
FET	Foundation Elective – Thermal
FED	Foundation Elective – Design
FEM	Foundation Elective – Management