R 25 Regulations
Course Structures
Mechanical Engineering
Academic Year: 2025-26

I-Year, Semester-I

S.No	Course Code	Course Title	L	T	P	Credits
1		Matrices and Calculus	3	1	0	4
2		Advanced Engineering Physics	3	0	0	3
3		C Programming and Data Structures	3	0	0	3
4		Engineering Mechanics	3	0	0	3
5		English for Skill Enhancement	3	0	0	3
6		Advanced Engineering Physics Laboratory	0	0	2	1
7		C Programming and Data Structures Laboratory	0	0	2	1
8		Engineering Workshop	0	0	2	1
9		English Language and Communication Skills Lab	0	0	2	1
10		Induction Program				
		Total Credits	**15**	**1**	**8**	**20**

I-Year, Semester-II

S.No	Course Code	Course Title	L	T	P	Credits
1		Ordinary Differential Equations and Vector Calculus	3	0	0	3
2		Applied Chemistry	3	0	0	3
3		Python Programming	3	0	0	3
4		Elements of Electrical and Electronics Engineering	3	0	0	3
5		Thermodynamics	3	0	0	3
6		Engineering Graphics and Computer Aided Drafting	2	0	2	3
7		Chemistry Laboratory for Engineers	0	0	2	1
8		Python Programming Laboratory	0	0	2	1
9		Elements of Electrical and Electronics Engineering Lab	0	0	2	1
		Total Credits	**17**	**0**	**8**	**21**

II-Year, Semester-I

S.No	Course Code	Course Title	L	T	P	Credits
1		Probability, Statistics and Complex Variables	3	0	0	3
2		Mechanics of Solids	3	0	0	3
3		Material Science and Metallurgy	3	0	0	3
4		Production Technology	3	0	0	3
5		Fluid Mechanics and Hydraulic Machines	3	0	0	3
6		Computational Mathematics Laboratory	0	0	2	1
7		Production Technology Laboratory	0	0	2	1
8		Material Science and Mechanics of Solids Laboratory	0	0	2	1
9		Fluid Mechanics and Hydraulic Machines Laboratory	0	0	2	1
10		Design Thinking and Ideation(Skill Development Course – 1)	0	0	2	1
		Total Credits	**15**	**0**	**10**	**20**

II-Year, Semester-II

S.No	Course Code	Course Title	L	T	P	Credits
1		Kinematics of Machinery	3	0	0	3
2		Thermal Engineering-I	3	0	0	3
3		Design of Machine Elements	3	0	0	3
4		Instrumentation and Control Systems	3	0	0	3
5		Operations Research	2	0	0	2
6		Innovation and Entrepreneurship	2	0	0	2
7		Conventional and Computer Aided Machine Drawing	0	0	2	1
8		Instrumentation and Control Systems Laboratory	0	0	2	1
9		Thermal Engineering-I Laboratory	0	0	2	1
10		Data Analytics and Python for Engineers(Skill Development Course-2)	0	0	2	1
11		Indian Knowledge System	1	0	0	1
		Total Credits	**17**	**0**	**8**	**21**

Note: Students who wish to exit after II Year II Semester has to register for this optional course and acquire the credits allotted by doing 6 weeks Work-based Vocational Course/ Internship or Apprenticeship. Please refer R25 Academic Regulations for more information.

III-Year, Semester-I

S.No	Course Code	Course Title	L	T	P	Credits
1		Design of Transmission Elements	3	0	0	3
2		Thermal Engineering- II	3	0	0	3
3		Metrology and Machine Tools	3	0	0	3
4		Professional Elective-I	3	0	0	3
5		Open Elective-I	2	0	0	2
6		Thermal Engineering-II Laboratory	0	0	2	1
7		Metrology and Machine Tools Laboratory	0	0	2	1
8		Modelling and Drafting Laboratory	0	0	2	1
9		Field Based Project/Internship	0	0	4	2
10		Modelling and Simulation Tools(Skill Development Course-3)	0	0	2	1
11		Gender Sensitization Lab*/Human Values and Professional Ethics*	1	0	0	1
		Total Credits	**15**	**0**	**12**	**21**

III-Year, Semester-II

S.No	Course Code	Course Title	L	T	P	Credits
1		Dynamics of Machinery	3	0	0	3
2		Heat Transfer	3	0	0	3
3		Business Economics and Financial Analysis	3	0	0	3
4		Professional Elective-II	3	0	0	3
5		Open Elective–II	2	0	0	2
6		Heat Transfer Lab	0	0	2	1
7		Applied Manufacturing Laboratory	0	0	2	1
8		Kinematics and Dynamics Laboratory	0	0	2	1
9		Advanced English Communication Skills Laboratory	0	0	2	1
10		Troubleshooting of Mechanical Systems(Skill Development Course-4)	0	0	2	1
11		Environmental Science	1	0	0	1
		Total Credits	**15**	**0**	**10**	**20**

Note: For the courses Gender Sensitization Lab and Human Values and Professional Ethics - one hour of instruction will be conducted on alternate weeks. For example, if a one-hour class for Gender Sensitization Lab is conducted this week, then a one-hour class for Human Values and Professional Ethics will be conducted in the following week.

IV-Year, Semester-I

S.No	Course Code	Course Title	L	T	P	Credits
1		Finite Element Methods	3	0	0	3
2		Robotics and Automation	3	0	0	3
3		Industrial Engineering and Management	3	0	0	3
4		Professional Elective- III	3	0	0	3
5		Professional Elective–IV	3	0	0	3
6		Open Elective– III	2	0	0	2
7		Computer Aided Analysis Laboratory	0	0	2	1
8		Robotics and Automation Laboratory	0	0	2	1
9		Industry Oriented Mini Project/Summer Internship	0	0	4	2
		Total Credits	**17**	**0**	**8**	**21**

IV-Year, Semester-II

S.No	Course Code	Course Title	L	T	P	Credits
1		Professional Elective–V	3	0	0	3
2		Professional Elective–VI	3	0	0	3
3		Project Work	0	0	28	14
		Total Credits	**6**	**0**	**28**	**20**

Professional Electives

Professional Elective-I

Course Code	Course Title
	Power Plant Engineering
	Automobile Engineering
	Refrigeration and Air-Conditioning
	Renewable Energy Sources

Professional Elective-II

Course Code	Course Title
	Additive Manufacturing
	Micro Manufacturing
	Artificial Intelligence in Mechanical Engineering
	Advanced Machining Processes

Professional Elective-III

Course Code	Course Title
	Mechanical Vibrations
	Mechanics of Composite Materials and Structures
	Design for Manufacturing and Assembly
	Mechatronic Systems

Professional Elective-IV

Course Code	Course Title
	Plant Maintenance and Reliability Engineering
	Total Quality Management
	Database Management Systems
	Production Planning and Control

Professional Elective-V

Course Code	Course Title
	Product Design and Manufacturing
	Computational Fluid Dynamics
	Electric and Hybrid Vehicles
	Artificial Neural Networks

Professional Elective-VI

Course Code	Course Title
	Hydraulics and Pneumatics
	Sustainable Engineering
	AI/ML for Design Analysis
	Project Management

Open Electives

Open Elective-I

Course Code	Course Title
	Optimization Methods
	Industrial Robotics

Open Elective-II

Course Code	Course Title
	Artificial Intelligence in Mechanical Engineering
	Non-Conventional Sources of Energy

Open Elective-III

Course Code	Course Title
	Engineering Materials
	Digital Manufacturing