

Department of Mechanical Engineering

SCHEME & SYLLABUS

B.Tech. Mechanical Engineering

2025-26



Shri G S Institute of Technology & Science Indore

[Govt. Aided Autonomous Institute Estd. In 1952]



Vision and Mission of Institute

Vision:

A front-line institute in science and technology making significant contributions to Human resource development envisaging dynamic needs of the society.

Mission:

To generate experts in science and technology akin to society for its accelerated Socio-economic growth in professional and challenging environment imparting Human values.

Vision and Mission of Department

Vision:

To be recognized globally for outstanding education and research leading to develop well qualified engineers who are innovative, entrepreneurial and successful in advanced fields of Mechanical engineering and research.

Mission:

M1- To provide state of the art education to students of Mechanical Engineering.

M2- To enable the students to cater the needs of society and industries.

M3- To excel in research and development activities in Mechanical Engineering.

Program Educational Objective (PEOs)

PEO1: To develop students for applying Mechanical Engineering knowledge and problem solving skill in their professional careers.

PEO2: To create interest in lifelong learning by pursuing higher education in specific field.

PEO3: The mechanical Engineering graduates shall have high moral values/ ethics to build an efficient team with appropriate soft skill capabilities.



Department of Mechanical Engineering (2025-26)

Program Outcomes

Graduates Engineers will be able to

- (i) **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- (ii) **Problem Analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- (iii) **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.
- (iv) **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 for complex problems.
- (v) **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- (vi) **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.
- (vii) **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.
- (viii) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- (ix) **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- (x) **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.
- (xi) **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.
- (xii) **Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Program Specific Outcomes

Graduates Engineers will be able to

PSO1: Apply mechanical design engineering, thermal engineering and interdisciplinary knowledge for analyzing, designing, and manufacturing products to address the need of society.

PSO2: Implement state of the art knowledge and technology in order to fulfill current industrial requirement.



I B.TECH. (4YDC) MECHANICAL ENGINEERING

Semester :A (1st Year – Common to all Branches)

Semester : I														
Sr. No.	Subject Code	Subject Category	Subject	Credits			Hours/Week			Theory		Practical		Total Credits
				L	T	P	L	T	P	Th.	CW	Pr.	SW	
1	MA10021	BSC	Mathematics for Engineers	2	1	0	2	1	0	70	30	0	0	3
2	HU10181	HSMC	Understanding Bharat	0	2	1	0	2	2	-	-	60	40	3
3	CO10007	ESC	Fundamentals of Information Technology & Artificial Intelligence	2	1	2	2	1	4	70	30	60	40	5
4	ME10008	ESC	Overview of Mechanical Engineering and Graphics	2	0	2	2	0	4	70	30	60	40	4
5	PH10009	BSC	Applied Physics	2	0	1	2	0	2	70	30	60	40	3
6	CH10010	BSC	Chemistry for Engineers	1	0	1	1	0	2	70	30	60	40	2
Total				9	4	7	9	4	14	350	150	300	200	20

Semester : B (1st Year – Common to all Branches)

Semester : II														
Sr. No.	Subject Code	Subject Category	Subject	Credits			Hours/Week			Theory		Practical		Total Credits
				L	T	P	L	T	P	Th.	CW	Pr.	SW	
1	MA10509	BSC	Mathematics for Data Science	2	1	0	2	1	0	70	30	-	-	3
2	EE10510	ESC	Fundamentals of Electrical & Electronics Engineering	2	1	1	2	1	2	70	30	60	40	4
3	HU10512	HSMC	Language for Engineers	1	1	1	1	1	2	70	30	60	40	3
4	CE10513	ESC	Fundamentals of Civil Engineering and Applied Mechanics	2	1	1	2	1	2	70	30	60	40	4
5	PY10514	BSC	Biology for Engineers	2	0	1	2	0	2	70	30	60	40	3
6	IP10584	ESC	Design Thinking and Manufacturing Practices	0	1	2	0	1	4	-	-	60	40	3
Total-				9	5	6	9	5	12	350	150	300	200	20



Shri Govindram Seksaria Institute of Technology and Science

B.Tech. Mechanical Engineering Department

II B.TECH. (4YDC) MECHANICAL ENGINEERING

Semester: III													
Sr. No.	Subject Category	Subject Code	Subject	Hours per Week			Credit		Maximum Marks				Total
				L	T	P	Th	Pr	Th.	CW	SW	Pr.	
1	PCC	ME26021	Fluid Mechanics	3	-	-	3	-	70	30	-	-	100
2	PCC	ME26012	Strength of Materials	3	-	-	3	-	70	30	-	-	100
3	BSC	MA26014	Mathematics -III	3	-	-	4	-	70	30	-	-	100
4	PCC	ME26018	Material Science	3	-	-	3	-	70	30	-	-	100
5	PCC	ME26015	Engineering Thermodynamics	3	-	-	3	-	70	30	-	-	100
6	LC	ME26401	Fluid Mechanics Lab	-	-	2	-	1	-	-	40	60	100
7	LC	ME26402	Strength of Material Lab	-	-	2	-	1	-	-	40	60	100
8	LC	ME26403	Material Science Lab	-	-	2	-	1	-	-	40	60	100
9	LC	ME26404	Engineering Thermodynamics Lab	-	-	2	-	1	-	-	40	60	100
10	HSMC	HU26481	Values, Humanity and Professional Ethics	-	2	-	2	-	-	100	-	-	100
11	PCC	ME26405	Skill Lab-1, Modelling/ Simulation Software	-	-	2	-	1	-	-	40	60	100
12	MC	ME26482	Design Thinking	-	1	-	1	-	-	30	-	-	30
13	MC	MEM2002	Environmental Science *	2	-	-	-	-	-	50	-	-	50
* Non Credit Mandatory Subject.				Total	17	3	10	18	5	350	330	200	1080

Semester: IV													
Sr. No.	Subject Category	Subject Code	Subject	Hours per Week			Credit		Maximum Marks				Total
				L	T	P	Th	Pr	Th.	CW	SW	Pr.	
1	PCC	ME26501	Machine Design – I	3	-	-	3	-	70	30	-	-	100
2	PCC	ME26512	Kinematics & Dynamics of Machine	3	1	-	4	-	70	30	-	-	100
3	PCC	ME26504	Measurement & Control Systems	3	-	-	3	-	70	30	-	-	100
4	PCC	IP26513	Manufacturing Processes	3	-	-	3	-	70	30	-	-	100
5	HSMC	HU26507	Economics for Engineers	3	-	-	3	-	70	30	-	-	100
6	LC	ME26802	Machine Design - I lab	-	-	2	-	1	-	-	40	60	100
7	LC	ME26803	Kinematics & Dynamics of Machine Lab	-	-	2	-	1	-	-	40	60	100
8	LC	ME26804	Measurement & Control System Lab	-	-	2	-	1	-	-	40	60	100
9	LC	ME26805	Manufacturing Processes Lab	-	-	2	-	1	-	-	40	60	100
10	PCC	ME26807	Skill Lab-2 Idea Lab	-	-	2	-	1	-	-	40	60	100
11	MC	HUM2052	Essence of Indian Knowledge Tradition*	2	-	-	-	-	-	50	-	-	50
* Non Credit Mandatory Subject.				Total	17	1	10	16	5	350	180	200	1050

Internship of 4-6 weeks between semester IV & semester V



III B.TECH. (4YDC) MECHANICAL ENGINEERING

Semester: V														
Sr. No.	Subject Category	Subject Code	Subject	Hours per Week			Credit		Maximum Marks				Total	
				L	T	P	Th	Pr	Th.	CW	SW	Pr.		
1	PCC	ME36009	Computer Aided Design	3	-	-	3	-	70	30	-	-	100	
2	PCC	ME36010	Mechatronics & Automation	3	-	-	3	-	70	30	-	-	100	
3	PCC	ME36012	Heat Transfer	3	-	-	3	-	70	30	-	-	100	
4	PCC	ME36007	Steam and Gas Power System	3	-	-	3	-	70	30	-	-	100	
5	PCC	IP36052	Manufacturing Processes-II	3	-	-	3	-	70	30	-	-	100	
6	LC	ME36401	Computer Aided Design Lab	-	-	2	-	1			40	60	100	
7	LC	ME36402	Mechatronics & Automation lab	-	-	2	-	1			40	60	100	
8	LC	ME36403	Heat Transfer lab	-	-	2	-	1			40	60	100	
9	LC	ME36404	Manufacturing Processes-II lab	-	-	2	-	1			40	60	100	
10	PROJ	ME36481	Evaluation of Industrial Training/ Internship	-	-	4	-	2	-	-	100	-	100	
11	MC	MEM3002	Environmental Science*	2	-	-	-	-	-	50	-	-	50	
* Non Credit Mandatory Subject.				Total	17	-	12	15	6	350	200	260	240	1050
Semester: VI														
Sr. No.	Subject Category	Subject Code	Subject	Hours per Week			Credit		Maximum Marks				Total	
				L	T	P	Th	Pr	Th.	CW	SW	Pr.		
1	PCC	ME36511	Refrigeration and Air conditioning	3	–	-	3	-	70	30	-	-	100	
2	PCC	ME36513	Machine Design – II	3	-	-	3	-	70	30	-	-	100	
3	PCC	ME36516	Fluid Machinery	3	-	-	3	-	70	30	-	-	100	
4	PEC	ME36519	Internal Combustion Engines	3	-	-	3	-	70	30	-	-	100	
5	HSMC	IP36504	Industrial Engineering and Production Management	3	-	-	3	-	70	30	-	-	100	
6	LC	MExxxx	Refrigeration and Air conditioning Lab	-	-	2	-	1	-	-	40	60	100	
7	LC	MExxxx	Machine Design – II Lab	-	-	4	-	2	-	-	40	60	100	
8	LC	MExxxx	Fluid Machinery Lab	-	-	2	-	1	-	-	40	60	100	
9	LC	MExxxx	Internal Combustion Engines Lab	-	-	2	-	1	-	-	40	60	100	
10	PROJ	ME36581	Minor Project	-	-	4	-	2	-	-	100	-	100	
* Non Credit Mandatory Subject.				Total	15	0	14	15	7	350	150	260	240	1000

Internship of 4-6weeks between semester VI & semester VII.



IV B.TECH. (4YDC) MECHANICAL ENGINEERING

Semester: VII																
Sr. No.	Subject Category	Subject Code	Subject	Hours per Week			Credit		Maximum Marks				Total			
				L	T	P	Th	Pr	Th.	CW	SW	Pr.				
1	PEC	ME46018	Automobile Engineering	3	-	2	3	1	70	30	40	60	200			
2	PEC	ME46051	Vibration and Noise Control	3	-	2	3	1	70	30	40	60	200			
3	PEC	ME46020	Computer Aided Design	3	-	2	3	1	70	30	40	60	200			
4	PEC		Elective-I	3	-	-	3	-	70	30	-	-	100			
5	PEC		Elective-II	3	-	-	3	-	70	30	-	-	100			
6	PROJ	ME46481	Industrial Training	-	-	-	-	2	-	-	100	-	100			
7	PROJ	ME46498	Major Project Phase-I (AB Group)	-	-	6	-	3	-	-	40	60	100			
8	PROJ	ME46998	Major Project Phase-II (BA Group)	-	-	8	-	4	-	-	60	90	150			
Total				For AB Group			15	0	12	15	8	350	150	260	240	1000
				For BA Group			15	0	14	15	9	350	150	280	270	1050

Elective-I			SEMESTER - VII
S.No	Subject Category	Subject Code	Subject
1		ME46218	Mechatronics & Automation
2		ME46219	Advanced Machine Design
3		ME46220	Industrial Tribology and Maintenance
4		ME	Design of Air Conditioning Equipment

Elective-II			SEMESTER - VII
S.No	Subject Category	Subject Code	Subject
1		IP46316	Operational Research
2		ME46315	Hydraulic, Pneumatic & Fluid Control
3			Bio- Mechanics
4		ME463**	Manufacturing Automation & CAM
5		ME46327	Data Science and Machine Learning
6		ME46314	Power Plant and Energy Management



IV B.TECH. (4YDC) MECHANICAL ENGINEERING

Semester: VIII													
Sr. No.	Subject Category	Subject Code	Subject	Hours per Week			Credit		Maximum Marks				Total
				L	T	P	Th	Pr	Th.	CW	SW	Pr.	
1	PEC		Elective III	3	-	-	3	-	70	30	-	-	100
2	PEC		Elective IV	3	-	-	3	-	70	30	-	-	100
3	PROJ	ME46882	Industrial Training/Internship	-	-	-	-	4	-	-	100	-	100
4	PROJ	ME46998	Major Project Phase- II (AB Group)	-	-	8	-	4	-	-	60	90	150
5	PROJ	ME46498	Major Project Phase-I (BA Group)	-	-	6	-	3	-	-	40	60	100
Total			For AB Group	6	0	8	6	8	140	60	160	90	450
			For BA Group	6	0	6	6	7	140	60	140	60	400

Elective-III			SEMESTER - VIII
S.No	Subject Category	Subject Code	Subject
1		ME46667	Composite Materials
2		ME46668	Renewable Energy Sources
3		IP46669	Industrial Inspections & Quality Control
4		ME46670	Finite Element Methods
5		ME46672	Robotics
6		ME46673	Rotor Dynamics
7		ME46671	Artificial Intelligence

Elective-IV			SEMESTER - VIII
S.No	Subject Category	Subject Code	Subject
1		ME46708	Gas Dynamics & Fluid Control
2		ME46705	Engineering Optimization
3		ME46704	Design of Thermal Systems
4		ME46707	Computational Fluid Dynamics
5		ME46706	3D Printing and Design