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B. Tech. in Mechanical Engineering

B.Tech. in Mechanical Engineering (4 Years)

The curriculum consists of a mixture of well thought-out courses in the following broad categories: Language, Mathematics, Science, Engineering Science, Humanities/Social Sciences/Management, Professional Courses, Elective Courses, Laboratory Courses, Project Courses. A semester-wise structure of the curriculum for each Programme, currently being followed, is given below. However, the semester-wise structure is not followed rigidly. In fact, the students are encouraged to change the structure of their curriculum, to the extent feasible and desirable, to accommodate their own aspirations. The curriculum of is reviewed, periodically, with a view to incorporate the latest advances pertaining to the Programme.

Program Educational objectives (PEOs)

PEO1: To provide the strong fundamental knowledge in Engineering Sciences and Mathematics among students so as to enable them to plan, design, construct and maintain mechanical engineering systems that are technically sound, economically feasible and socially acceptable to enhance quality of life.

PEO2: To develop ability among the students to apply analytical, computational and simulation tools & techniques to address the challenges faced in mechanical and allied engineering streams

PEO3: To provide opportunities for the students to demonstrate leadership & entrepreneurial skills and prepare them to work with multidiscipline field of engineering.

PEO4: To prepare the students to exhibit professionalism, ethical attitude, team spirit and enable them to understand the need for lifelong learning to achieve career and organizational goals.

Program Specific Outcomes (PSOs)

After the successful completion of B. Tech. Programme in Mechanical Engineering, the graduates will be able to

PSO1 Identify, formulate, analyse and develop manufacturing, design, industrial, mechatronics and thermal systems for solving various problems in industry and society.

PSO 2 Pursue higher education and research in Fundamental, applied , and interdisciplinary areas to gain knowledge in emerging scientific technologies.

PSO 3 Utilize mechanical engineering skill to build a career in research labs and industry.

Mechanical- Mechatronics Engineering Department has twelve Program Outcomes (POs) as defined by NBA

Program Outcomes (POs)

PO1 - Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.

PO2 - Problem analysis: Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

PO3 - Design/development of solutions: Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 - Conduct investigations of complex problems: Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 - 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.

PO6 - 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.

PO7 - 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.

PO8 - Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 - Individual and team work: Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

PO10 - Communication: Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

PO11 - Project management and finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

PO12 - 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.

The detailed curriculum structure of the B.Tech. (MME) programme is as follows:

1st Semester:

S. No.	Course Code	Course Description	Type	L	T	P	Credits
1	PHY102	Classical Physics	IC	3	1	0	4
2	PHY113	UG Physics Laboratory	IC	0	0	3	2
3	MTH102	Mathematics – I	IC	3	1	0	4
4	ECE105	Basic Electronics	IC	3	1	0	4
5	ECE106	Basic Electronics Lab	IC	0	0	3	2
6	CSE104	Computer Programming	IC	3	0	0	3
7	CSE104(L)	Computer Programming Lab	IC	0	0	3	2
8	ENG105(B)	Technical Communication in English	IC	3	0	0	3
Total Credits = 24							

2nd Semester:

S. No.		Course Description	Type	L	T	P	Credits
1	PHY108	Introduction to Modern Physics	PC	3	0	0	3
2	MTH108	Mathematics – II	IC	3	1	0	4
3	CSE213	Data Structures and Algorithms	IC	3	0	0	3

4	CSE213(L)	Data Structures and Algorithms Lab	IC	0	0	2	1
5	MME201	Environmental Ecology & Biology	IC	3	0	0	3
6	HSS102	Value Education & Ethics	IC	3	0	0	3
7	MME102	Engineering Graphics Lab	PC	0	0	3	2
8	MME103	Engineering Physical Metallurgy	PC	3	0	0	3
Total Credits = 22							

3rd Semester:

S. No.		Course Description	Type	L	T	P	Credits
1	MTH213	Mathematics – III	IC	3	1	0	4
2	MME210	Modern Electrical and Electronics Technologies	PC	3	0	0	3
3	MME205	Mechanics of Solids	PC	3	0	0	3
4	MME205(L)	Mechanics of Solids Lab	PC	0	0	2	1
5	MME211	Manufacturing Technology – 1	PC	3	0	0	3
6	MME211(L)	Manufacturing Technology Lab	PC	0	0	3	2
7	MME209	Engineering Thermodynamics	PC	3	1	0	4
8	MME212	Industrial Engineering and Management	PC	3	0	0	3
Total Credits = 23							

4th Semester:

S. No.		Course Description	Type	L	T	P	Credits
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1	MME307	Machine Design – 1	PC	3	0	0	3
2	MME206	Kinematics & Dynamics	PC	3	0	0	3
3	MME206(L)	Kinematics & Dynamics Lab	PC	0	0	2	1
4	MME303	Fluid Mechanics & Machinery	PC	3	0	0	3
5	MME303(L)	Fluid Mechanics & Machinery Lab	PC	0	0	2	1
6	MME308	Metrology, Instrumentation and control	PC	3	0	0	3
7	MME308(L)	Metrology, Instrumentation and control Lab	PC	0	0	2	1
8	MME309	Total Quality Management	PC	3	0	0	3
9	MME310	Manufacturing Technology – 2	PC	3	0	0	3
Total Credits = 21							

5th Semester:

S. No.		Course Description	Type	L	T	P	Credits
1	MME311	Heat Transfer	PC	3	0	0	3
2	MME311(L)	Heat Transfer Lab	PC	0	0	2	1
3	MME312	Machine Design – 2	PC	3	0	0	3
4	MME312(L)	Machine Design – 2 Lab	PC	0	0	2	1
5	MME305	CAD – CAM	PC	3	0	0	3
6	MME305(L)	CAD – CAM Lab	PC	0	0	2	1
7		Program Elective – 1	PE	3	0	0	3

8	HSS204 / HSS203	Economics for Engineers/Psychology, Technology and Society	IC	3	0	0	3
Total Credits = 18							

6th Semester:

S. No.		Course Description	Type	L	T	P	Credits
1	MME313	IC Engines	PC	3	0	0	3
2	MME313(L)	IC Engines Lab	PC	0	0	2	1
3		BTP	IC	3	0	0	3
4		Program Elective – 2	PE	3	0	0	3
5		Other Elective – 1	OE	3	0	0	3
6	HSS204 / HSS203	Economics for Engineers/Psychology, Technology and Society	IC	3	0	0	3
Total Credits = 16							

7th Semester:

S. No.		Course Description	Type	L	T	P	Credits
1		BTP	IC	3	0	0	3
2		Program Elective – 3	PE	3	0	0	3
3		Program Elective – 4	PE	3	0	0	3

4		Other Elective – 2	OE	3	0	0	3
5		Other Elective – 3	OE	3	0	0	3
							Total Credits = 15

8th Semester:

S. No.		Course Description	Type	L	T	P	Credits
1		Program Elective – 5	PE	3	0	0	3
2		Other Elective – 4	OE	3	0	0	3
3		Other Elective – 5	OE	3	0	0	3
							Total Credits = 9

Total Credits	148
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Selective list of Programme Electives:

Sr. No.	Name of Programme Electives
1	Failure Analysis and Design
2	Numerical Methods
3	Vehicle Dynamics
4	Automotive Power Transmission Systems
5	Robotics and Industrial Automation

6	Refrigeration and Conditioning
7	Cryogenics
8	Power Plant Engineering
9	Energy Engineering
10	CFD
11	Welding and Allied Processes
12	Mechanical Vibration
13	Energy Conversion and Managements
14	Unconventional Machining Processes

Selective list of Other Electives:

S. No.	Name of course
1	Active Directory
2	Algebra
3	Automotive Electronics
4	Autosar
5	Basics of Finance and Soft Skills
6	Bio-Medical Engineering
7	Biosensors: Concepts and Applications
8	Cinema and Indian Society

9	Classical Mechanics and Field Theory
10	Colonialism and the Making of Modern India
11	Computational Physics
12	Corpus Pragmatics
13	Digital VLSI Circuits
14	Electrical Machines & Power Systems
15	Engineering Chemistry
16	Entrepreneurship Practice
17	Ethnic Conflict: Literature and South Asia
18	French
19	Graph Theory
20	Green Communication and Networking
21	Indian Modernity: Text & Context
22	Industrial Engineering and Management
23	Industrial Management
24	International Economics and Soft Skills
25	Internet of Things
26	Introduction to Nano Science and Engineering
27	Linear Algebra
28	Logical and Critical Thinking
29	Macro Economics for Managers

30	Mathematical Physics
31	Mathematical Structures for Engineers
32	Modernism: Literary Representation
33	Nano Technology
34	Natural Nanoworld: Design, Fundamentals and Mechanics
35	Non Linear Dynamics and Chaos
36	Numeric Linear Algebra
37	Numerical Analysis
38	Numerical Methods
39	Operation Research
40	Optimization
41	Organic Electronics and Opto Electronics: Material and Applications
42	Organisational Behaviour
43	Pervasive Computing
44	Physics of Material
45	Physics of The Universe
46	Pragmatics in Social Media
47	Solid State Physics
48	Superconductivity: Basics and Applications
49	System Dynamics and Control
50	System Level Specifications and Design

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