

**Bachelor of Engineering in
Mechanical Engineering
Study Scheme
2020**

Vision of the department

The department shall strive to act as a podium for the development and transfer of technical competence in academics, impart appropriate skills, entrepreneurship and research in the field of Mechanical Engineering to meet the changing need of society.

Mission of the department

1. To provide modular programmes from skill development to the research level.
2. To impart technical education and training in innovative state-of-the-art technology in the field of mechanical engineering.
3. To disseminate of knowledge and information by organizing seminars/workshops/short term courses in a planned manner.
4. To provide extension services to rural society, industry professionals, institutions of research and higher learning in the field of mechanical engineering.
5. To interact with the industry, educational and research organizations, and alumni in the fields of curriculum development, training and research for sustainable social development and changing needs of society.

Programme Outcome (PO) s: UG

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and manufacturing/welding specialisation for the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyse complex mechanical/welding engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex mechanical engineering problems or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
4. **Conduct investigations of complex problems:** Conduct investigations of complex manufacturing/welding problems using 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:** To apply appropriate techniques, resources and engineering and IT tools for modelling of different manufacturing/welding problems 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 manufacturing/welding engineering practice.
9. **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex manufacturing/welding engineering activities with the engineering community and with the 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 manufacturing/welding 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: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Participate and succeed in competitive examination for higher studies.

Program specific outcomes (PSO)

1. Graduates having an ability to identify, analyze and solve engineering problems relating to mechanical systems together with allied engineering streams.
2. Graduates will be able to build the nation, by imparting technological inputs and managerial skills to become Technocrats and Entrepreneurs.
3. Graduates will be able to develop new concepts on various emerging fields and pursue advanced research.

Study Scheme of Bachelor of Engineering in Mechanical Engineering

Semester-I							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	BSMA-401	Engineering Mathematics I	3	1	0	4	4
2	BSCH-401	Applied Chemistry	3	1	0	4	4
3	ESME-401	Elements of Mechanical Engineering	2	1	0	3	3
4	ESME-402	Workshop Technology and Practice	1	0	0	1	1
5	HSMC-401	English Communication and Soft Skills	1	0	0	1	1
6	BSCH-402	Applied Chemistry Lab	0	0	2	2	1
7	ESME-403	Elements of Mechanical Engineering Lab	0	0	2	2	1
8	ESME-404	Engineering Drawing	0	0	4	4	2
9	ESME-405	Workshop Technology and Practice Lab	0	0	4	4	2
10	HSMC-402	English Communication and Soft Skills Lab	0	0	2	2	1
11	MCCH-401	Environmental Studies	3	0	0	3	0
Total			13	3	14	30	20
Semester-II- A							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	BSMA-402	Engineering Mathematics II	3	1	0	4	4
2	BSPH-401	Applied Physics	3	1	0	4	4
3	ESEE-401	Elements of Electrical Engineering	2	1	0	3	3
4	ESCS-401	Elements of Computer Engineering	2	0	0	2	2
5	ESEC-401	Elements of Electronics Engineering	2	0	0	2	2
6	BSPH-402	Applied Physics Lab	0	0	2	2	1
7	ESEE-402	Elements of Electrical Engineering Lab	0	0	2	2	1
8	ESCS-402	Elements of Computer Engineering Lab	0	0	4	4	2
9	ESEC-402	Elements of Electronics Engineering Lab	0	0	2	2	1
Total			12	3	10	25	20
Semester-II-B							
	TPIN-421	Practical Training During Summer Vacations (In-house) 02 weeks	0	0	40	40	1 (S/US)
	TPIN-422	Technical competency	0	0	40	40	1(S/US)
Semester-III							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	ESME-501	Engineering Mechanics	3	1	0	4	4
2	PCME-511	Applied Thermodynamics	3	1	0	4	4
3	PCME-512	Manufacturing Processes	3	0	0	3	3
4	PCME-513	Fluid Mechanics and Machinery	3	1	0	4	4
5	HSMC-501	Principles of Management	3	0	0	3	3
6	PCME-514	Applied Thermodynamics Lab	0	0	2	2	1
7	PCME-515	Fluid Mechanics and Machinery Lab	0	0	2	2	1
8	MCMH-501	Indian Constitution	3	0	0	3	0
Total			18	3	4	25	20

Semester-IV-A							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	BSMA-501	Numerical and Statistical Methods	3	0	0	3	3
2	PCME-521	Physical Metallurgy	2	0	0	2	2
3	PCME-522	Kinematics of Machines	3	0	0	3	3
4	PCME-523	Strength of Materials	3	1	0	4	4
5	BSBL-501	Biology for Engineers	2	0	0	2	2
6	BSMA-502	Numerical and Statistical Methods Lab	0	0	2	2	1
7	PCME-524	Kinematics of Machines Lab	0	0	2	2	1
8	PCME-525	Strength of Materials Lab	0	0	2	2	1
9	PCME-526	Machine Drawing	0	0	4	4	2
10	PCME-527	Physical Metallurgy Lab	0	0	2	2	1
Total			13	1	12	26	20
Semester-IV-B							
1	TPID-521	Industrial Training 02 weeks	0	0	80	80	1 (S/US)
2	EAA-521#(#-A/B/C)	Credit course/Extra Academic activity Group A/B/C	-	-	-	-	1 (S/US)
Semester-V A							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	PCME-611	Machine Design-I	3	1	0	4	4
2	PCME-612	Measurement and Instrumentation	2	1	0	3	3
3	OEXX-611	Open Elective-1	3	0	0	3	3
4	OEXX-612	Open Elective-2	3	0	0	3	3
5	PEME-611	Professional Elective-1	3	0	0	3	3
6	HSMC-603	Engineering Economics and Entrepreneurship	3	0	0	3	3
7	PCME-613	Measurement and Instrumentation Lab	0	0	2	2	1
Total			17	2	2	21	20
Semester-V-B							
	EAA-611#(#-A/B/C)	Credit course/Extra Academic activity Group A/B/C	-	-	-	-	1 (S/US)
Semester-VI-A							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	PCME-621	Heat & Mass Transfer	3	0	0	3	3
2	PCME-622	Principles of Industrial Engineering	3	1	0	4	4
3	OEXX-621	Open Elective-3	3	0	0	3	3
4	OEXX-622	Open Elective-4	3	0	0	3	3
5	PEME-621	Professional Elective-2	3	0	0	3	3
6	HSMC-601	Technical Communication	2	0	0	2	2
7	PCME-623	Heat & Mass Transfer Lab	0	0	2	2	1
8	HSMC-602	Technical Communication Lab	0	0	2	2	1
Total			17	1	4	22	20

Semester-VI-B							
1	TPID-621	Industrial Training 04 weeks	0	0	160	160	2 (S/US)
2	EAA-621#(#-A/B/C)	Credit course/Extra Academic activity Group A/B/C	-	-	-	-	1 (S/US)
Semester-VII							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	PCME-711	CAD/CAM	3	0	0	3	3
2	PCME-712	Machine Design-II	3	1	0	4	4
3	OEXX-711	Open Elective-5	3	0	0	3	3
4	PEME-711	Professional Elective-3	3	1	0	4	4
5	PEME-712	Professional Elective-4	3	0	0	3	3
6	PCME-713	CAD/CAM Lab	0	0	2	2	1
7	PRME-711	Project Stage I and Seminar	0	0	4	4	2
		Total	15	2	6	23	20
Semester-VIII							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	PEME-721	Professional Elective-5	3	0	0	3	3
2	PEME-722	Professional Elective-6	3	0	0	3	3
3	PRME-721	Project Stage II	0	0	12	12	6
		Total	6	0	12	18	12
OR							
S No	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	INID-721	Internship in Industry	0	0	40	40	6
2	PRME-721	Project Stage II	0	0	12	12	6
		Total	0	0	52	52	12

List of Open Electives

OEME-611	Open Elective- 1
OEME-611A	Power Plant Engineering
OEME-611B	Automobile Engineering
OEME-611C	Welding - Processes, Codes and Standards

OEME-612	Open Elective- 2
OEME-612A	Refrigeration & Air Conditioning
OEME-612B	Measurement and Instrumentation
OEME-612C	Finite Element Method (FEM)

OEME-621	Open Elective- 3
OEME-621A	Cryogenic Engineering
OEME-621B	Safety Engineering
OEME-621C	Supply Chain Management

OEME-622	Open Elective- 4
OEME-622A	Quality Engineering
OEME-622B	Industrial Automation
OEME-622C	Optimization Techniques

OEME-711	Open Elective- 5
OEME-711A	Non Conventional Energy Resources
OEME-711B	Robotics
OEME-711C	Energy Auditing

List of Professional Electives

PEME-611	Professional Elective- 1
PEME-611A	Theory of Metal Cutting and Forming
PEME-611B	Advanced Strength of Material
PEME-611C	Welding - Processes, Codes and Standards
PEME-621	Professional Elective- 2
PEME-621A	Automobile Engineering
PEME-621B	Dynamics of Machines
PEME-621C	Power Plant Engineering
PEME-711	Professional Elective- 3
PEME-711A	Refrigeration & Air Conditioning
PEME-711B	Optimization Techniques
PEME-711C	Finite Element Method (FEM)
PEME-712	Professional Elective- 4
PEME-712A	Non Conventional Energy Resources
PEME-712B	Flexible manufacturing System(FMS)
PEME-712C	Supply Chain Management
PEME-721	Professional Elective- 5
PEME-721A	Cryogenic Engineering
PEME-721B	Industrial Automation
PEME-721C	Quality Engineering
PEME-722	Professional Elective- 6
PEME-722A	Robotics
PEME-722B	Energy Auditing
PEME-722C	Safety Engineering
PEME-722D	Work study and Ergonomics