



People's Education Society's (Mumbai)

P. E. S. COLLEGE OF ENGINEERING

(An Autonomous Institute)

Nagsen Vana, Chhatrapati Sambhajnagar, Maharashtra - 431002

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TEACHING AND EVALUATION SCHEME FOR UNDERGRADUATE PROGRAMME

Department of Mechanical Engineering

B. Tech. In

Mechanical Engineering

**In line with National Education Policy 2020 Guidelines
[With Effect from the Academic Year 2026-2027]**

			13/06/2026	2.00
Chairman Board of Studies	Dean Academics	Chairman Academic Council	Date of Release	Version

DEPARTMENT OF MECHANICAL ENGINEERING

Department Vision

To Mould and create a sound Mechanical Engineers for global competitiveness with required morality and social sense.

Department Mission

- To provide modern and advanced technical infrastructure for the technical growth of the student studying in Mechanical Engineering Department.
- To provide an embellished academic and congenial environment where the students are motivated to acquire the best learning experience.
- To provide the required facilities and environment for inculcating intellectual, moral, and social democracy for the overall development of the students.

Program Educational Objectives (PEOs)

PEO 1: Graduates will apply principles of science, mathematics, and engineering to solve engineering problems and contribute competitively in industry, research, or entrepreneurship.

PEO 2: Graduates will pursue higher education, professional certifications, research, and continuous learning to adapt to technological advancements.

PEO 3: Graduates will demonstrate leadership, effective communication, teamwork, and project management skills in multidisciplinary and multicultural environments.

PEO 4: Graduates will practice engineering with professional ethics, environmental consciousness, sustainability, and social responsibility.

PEO 5: Graduates will develop innovative solutions, engage in product development, and pursue entrepreneurial ventures that address societal and industrial needs.

Program Specific Outcomes (PSOs)

Upon successful completion of the Mechanical Engineering program, graduates will be able to:

PSO 1: Apply the principles of mechanics, materials, thermodynamics, fluid mechanics, and machine design to analyze, design, and develop mechanical systems and components for engineering applications.

PSO 2: Utilize modern manufacturing processes, tools, machining, automation, robotics, and quality control techniques to improve productivity and industrial performance.

PSO 3: Design, analyze, and optimize thermal, energy, and renewable energy systems with consideration for efficiency, sustainability, environmental impact, and economic feasibility.

**Curriculum Credit Structure for B. Tech.
Mechanical Engineering**

Year/Semester	Credits
SEM I & II	44
SEM III & IV	45
SEM V & VI	45
SEM VII & VIII	42
Total Credits	176

Semester wise Teaching and Evaluation Scheme with marks and credit distribution for the 4 year UG Program in Mechanical Engineering

S.N.	Semester	L	T	P	CA	MSE	ESE	Total Marks	Total Credits
1	I	15	3	14	320	80	400	800	22
2	II	21	3	6	340	80	380	800	22
3	III	18	1	8	210	110	480	800	23
4	IV	18	1	10	250	80	470	800	22
5	V	19	1	6	210	110	480	800	22
6	VI	17	1	10	210	110	480	800	23
7	VII	07	0	10	340	40	420	800	20
8	VIII	15	1	10	260	90	450	800	22
	TOTAL	130	11	74	2140	700	3560	6400	176

Illustrative Semester Wise Credit Distribution Structure for Four Year UG Engineering Program - One Major, One Minor (Mechanical Engineering)

Semester		Total Credits as per NEP 20 Guidelines	Total Credits as per PES, Mech . Dept.
Basic Science Course	BSC/ESC	14-18	17
Engineering Science Course		16-12	18
Programme Core Course (PCC)	Program Courses	44-56	59
Programme Elective Course (PEC)		20	15
Multidisciplinary Minor (MD M)	Multidisciplinary Courses	14	14
Open Elective (OE) Other than a particular program		08	08
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	08	08
Ability Enhancement Course (AEC -01, AEC-02)	Humanities Social Science and Management (HSSM)	04	11
Entrepreneurship/Economics/ Management Courses		04	
Indian Knowledge System (IKS)		02	
Value Education Course (VEC)		04	
Research Methodology	Experiential Learning Courses	04	22
Comm. Engg. Project (CEP)/Field Project(FP)		02	
Project		04	
Internship/OJT		12	
Co-curricular Courses(CC)	Liberal Learning Courses	04	04
Total Credits (Major)		160 -176	176

Abbreviations: Generic/ Open Electives: OE; Vocational Skill and Skill Enhancement Courses: VSEC; Vocational Skill Courses: VSC; Skill Enhancement Courses: SEC; Ability Enhancement Courses: AEC; Indian Knowledge System: IKS; Value Education Courses: VEC; OJT: On Job Training; Internship/Apprenticeship; Field projects: FP; Community engagement project: CEP; Co-curricular Courses: CC; RM: Research Methodology; Research Project: RP; Liberal Learning Course: Lib. Learn, Courses on Humanities, Social Science, and Management: HSSM.

Note: The Credit Distribution Table given above is illustrative only. The Universities/ Autonomous Colleges may suitably modify within the broader framework of credit distribution across seven verticals and as per the AICTE rules and regulation.


APPROVED in..... 3rd 
Academic Council Meeting
Dated :..... 13/06/2024



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Department of Mechanical Engineering

Second Year Teaching and Evaluation Scheme

w. e. f. 2026-2027

Program : B. Tech Mechanical Engineering

Semester - III											
Sr.No	Course Category	Course Code	Course Name	Teaching Scheme			Evaluation Scheme				Credits
				L	T	P	CA	MSE	ESE	Total	
1	BSC	BTPESME301T	Engineering Mathematics -III	3	0	0	20	20	60	100	3
2	PCC	BTPESME302T	Engineering Thermodynamics	3	0	0	20	20	60	100	3
3	PCC	BTPESME302L	Engineering Thermodynamics Lab	0	0	2	20	0	30	50	1
4	PCC	BTPESME303T	Mechanics of Materials	3	1	0	20	20	60	100	4
5	PCC	BTPESME303L	Mechanics of Materials Lab	0	0	2	40	0	60	100	1
6	PCC	BTPESME304L	Machine Drawing and CAD	0	0	4	40	0	60	100	2
7	MDM	BTPESMXXXX	Multidisciplinary Minor	2	0	0	10	10	30	50	2
8	OE	BTPESOE02T BTPESOE04T BTPESOE13T BTPESOE30T	Open Elective I	4	0	0	20	20	60	100	4
9	VEC	BTPESUHVT	Universal Human Values	3	0	0	20	20	60	100	3
Total				18	1	8	210	110	480	800	23

Open Elective - I			
Course Category	Course Code	Course Name	Course Domain
OE-I	BTPESOE02T	Business Communication	Management, Commerce & Entrepreneurship
OE-I	BTPESOE04T	Digital Marketing and E- Commerce	Management, Commerce & Entrepreneurship
OE-I	BTPESOE13T	Employability and Skill Development	Humanity ,Social Sciences & life Skills
OE-I	BTPESOE30T	Applied Mathematics	Science, Engineering Technology

Semester - IV

Sr. No	Course Category	Course Code	Course Name	Teaching Scheme			Evaluation Scheme				Credits
				L	T	P	CA	MSE	ESE	Total	
1	PCC	BTPESME401T	Fluid Mechanics and Hydraulic Machines	3	1	0	20	20	60	100	4
2	PCC	BTPESME401L	Fluid Mechanics and Hydraulic Machines Lab	0	0	2	20	0	30	50	1
3	PCC	BTPESME402T	Material Science and Metallurgy	3	0	0	20	20	60	100	3
4	PCC	BTPESME402L	Material Science and Metallurgy Lab	0	0	2	20	0	30	50	1
5	PCC	BTPESME403T	Manufacturing Processes	3	0	0	20	20	60	100	3
6	PCC	BTPESME403L	Manufacturing Processes Lab	0	0	2	20	0	30	50	1
7	MDM	BTPESMXXXX	Multidisciplinary Minor	2	0	0	10	10	30	50	2
8	OE	BTPESOE08T	Open Elective II	2	0	0	10	10	30	50	2
		BTPESOE33T									
		BTPESOE32T									
9	VSEC	BTPESFLA	Foreign Language Japanese German French Spanish	2	0	0	50	00	50	100	2
		BTPESFLB									
		BTPESFLC									
		BTPESFLD									
10	CEP/FP	BTPESME404L	Community Engagement Project & Seminar	0	0	4	40	0	60	100	2
11	HSSM	BTPESCOIT	Constitution of India	2	0	0	20	0	30	50	1
Total				17	1	10	250	80	470	800	22

Open Elective - II			
Course Category	Course Code	Course Name	Course Domain
OE-II	BTPESOE8T	Intellectual Property Rights (IPR)	Law, Policy & Governance
OE-II	BTPESOE33T	Python Programming	Management, Commerce & Entrepreneurship
OE-II	BTPESOE32T	Application of Drone Technology in Agriculture	Science, Engineering Technology
or			
A student may choose another course from the Institute-approved Open Elective Basket			

Third Year Teaching and Evaluation Scheme
w. e. f. 2027-2028
Program: B. Tech. Mechanical Engineering

Semester - V											
Sr. No	Course Category	Course Code	Course Name	Teaching Scheme			Evaluation Scheme				Credits
				L	T	P	CA	MSE	ESE	Total	
1	PCC	BTPESME501T	Heat Transfer	3	0	0	20	20	60	100	3
2	PCC	BTPESME501L	Heat Transfer Lab	0	0	2	20	0	30	50	1
3	PCC	BTPESME502T	Machine Design - I	3	1	0	20	20	60	100	4
4	PCC	BTPESME502L	Machine Design - I Lab	0	0	2	40	0	60	100	1
5	PCC	BTPESME503T	Theory of Machines	3	0	0	20	20	60	100	3
6	PCC	BTPESME503L	Theory of Machines Lab	0	0	2	40	0	60	100	1
7	PEC	BTPESMEPE504AT BTPESMEPE504BT BTPESMEPE504CT	Programme Elective course-I	3	0	0	20	20	60	100	3
8	MDM	BTPESMXXXX	Multidisciplinary Minor	4	0	0	20	20	60	100	4
10	OE	BTPESOE07T BTPESOE36T BTPESOR37T	Open Elective - III	2	0	0	10	10	30	50	2
Total				18	1	6	210	110	480	800	22

Programme Elective Course - I		
Course Category	Course Code	Course Name
PEC-I	BTPESMEPE504AT	Industrial Robotics and Automation
PEC-I	BTPESMEPE504BT	Metal Forming and Press Tool Design
PEC-I	BTPESMEPE504CT	Internal Combustion Engine

Open Elective - III			
Course Category	Course Code	Course Name	Course Domain
OE III	BTPESOE07T	Industrial Psychology and Organisational Behaviour.	Management, Commerce & Entrepreneurship
OE III	BTPESOE36T	Energy Audit and Management	Science , Engineering Technology
OE III	BTPESOR37T	Renewable Energy Engineering	Science , Engineering Technology
or			
A student may choose another course from the Institute-approved Open Elective Basket			

Semester - VI

Sr. No	Course Category	Course Code	Course Name	Teaching Scheme			Evaluation Scheme				Credits
				L	T	P	CA	MSE	ESE	Total	
1	PCC	BTPESME601T	Applied Hydraulics and Pneumatics	3	0	0	20	20	60	100	3
2	PCC	BTPESME601L	Applied Hydraulics and Pneumatics Lab	0	0	2	20	0	30	50	1
3	PCC	BTPESME602T	Metrology and Quality Control	3	0	0	20	20	60	100	3
4	PCC	BTPESME602L	Metrology and Quality Control Lab	0	0	2	20	0	30	50	1
5	PCC	BTPESME603T	Machine Design - II	3	1	0	20	20	60	100	4
6	PCC	BTPESME603L	Machine Design - II Lab	0	0	2	20	0	30	50	1
7	PEC	BTPESMEPE604AT BTPESMEPE604BT BTPESMEPE604CT	Programme Elective course-II	3	0	0	20	20	60	100	3
8	PEC	BTPESMEPE605AT BTPESMEPE605BT BTPESMEPE605CT	Programme Elective course-III	3	0	0	20	20	60	100	3
9	MDM	BTPESMXXXX	Multidisciplinary Minor	2	0	0	10	10	30	50	2
10	VSEC	BTPESME606L	Design Thinking Lab	0	0	4	40	0	60	100	2
Total				17	1	10	210	110	480	800	23

Programme Elective course - II

Course Category	Course Code	Course Name
PEC-II	BTPESMEPE604AT	Mechatronics
PEC-II	BTPESMEPE604BT	Automobile Engineering
PEC-II	BTPESMEPE604CT	Advanced Manufacturing Techniques

Programme Elective course - III

Course Category	Course Code	Course Name
PEC-III	BTPESMEPE605AT	Fundamentals of HVAC System
PEC-III	BTPESMEPE605BT	E Vehicles
PEC-III	BTPESMEPE605CT	Sustainable Manufacturing

Final Year Teaching and Evaluation Scheme
w. e .f . 2028-2029
Program: B. Tech Mechanical Engineering

Semester - VII											
Sr. No	Course Category	Course Code	Course Name	Teaching Scheme			Evaluation Scheme				Credits
				L	T	P	CA	MSE	ESE	Total	
1	PCC	BTPESME701T TO BTPESME708 T	Online NPTEL /MOOCs * Annexure	4	0	0	20	20	60	100	4
2	PEC	BTPESME701T TO BTPESME708 T	Online NPTEL /MOOCs * Annexure	3	0	0	20	20	60	100	2
3	MDM6	BTPESMXXXX	Multi Disciplinary Project	0	0	4	100	00	100	200	2
4	Project	BTPESME710L	Industrial Internship	0	0	6	200	0	200	400	12
Total				7	0	10	340	40	420	800	20

Semester - VIII

Sr. No	Course Category	Course Code	Course Name	Teaching Scheme			Evaluation Scheme				Credits
				L	T	P	CA	MSE	ESE	Total	
1	PCC	BTPESME801T	Industrial Engineering and Management	3	0	0	20	20	60	100	3
2	PCC	BTPESME802T	CAD / CAM	3	1	0	20	20	60	100	4
3	PCC	BTPESME802L	CAD / CAM Lab	0	0	2	50	0	50	100	1
4	ESC	BTPESME803T	Research Methodology	4	0	0	20	20	60	100	4
6	MDM	BTPESMXXXX	Multidisciplinary Minor	2	0	0	10	10	30	50	2
7	PEC	BTPESMEPE804AT BTPESMEPE804BT BTPESMEPE804CT BTPESMEPE804DT	Programme Elective course-IV	3	0	0	20	20	60	100	3
8	PEC	BTPESMEPE804AL BTPESMEPE804BL BTPESMEPE804CL BTPESMEPE804DL	Programme Elective course-IV Lab	0	0	2	20	0	30	50	1
9	ELC	BTPESME805L	Project	0	0	6	100	0	100	200	4
Total				15	1	10	260	90	450	800	22

Programme Elective course - IV

Course Category	Course Code	Course Name
PEC-IV	BTPESMEPE804AT	Automatic Control System
PEC-IV	BTPESMEPE804BT	Additive Manufacturing
PEC-IV	BTPESMEPE804CT	Project Management & Operation Research
PEC-IV	BTPESMEPE804DT	Logistics and Supply Chain Management



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Department of Mechanical Engineering

Multi-Disciplinary Minor (MDM) Basket –offered by Mechanical Engineering Department

Multi-Disciplinary Minor (MDM) Basket												
Sr. No	Course Category	Semester	Course Code	Course Name	Teaching Scheme			Evaluation Scheme				Credits
					L	T	P	CA	MSE	ESE	Total	
1	MDM	III	BTPESMME3T	Basic Manufacturing Processes	2	0	0	10	10	30	50	2
2	MDM	IV	BTPESMME4T	Thermo- Fluid Engineering	2	0	0	10	10	30	50	2
3	MDM	V	BTPESMME5T	Computer Aided Drafting and Modelling	4	0	0	20	20	60	100	4
4	MDM	VI	BTPESMME6T	Basics Of Design Engineering	2	0	0	10	10	30	50	2
5	MDM	VII	BTPESMME7L	Mult-Disciplinary Project	0	0	4	10	10	30	50	2
6	MDM	VIII	BTPESMME8	Metrology and Quality Control	2	0	0	10	10	30	50	2
Total					12	0	4	70	70	210	350	14



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List of Programme Elective Courses (PECs)

PEC Gr.	PEC- I BTPESMEPE504T A/B/C	PEC- II BTPESMEPE604T A/B/C	PEC- III BTPESMEPE605T A/B/C	PESC- IV BTPESMEPE804T A/B/C/D
A	Industrial Robotics and Automation	Mechatronics	Fundamentals of HVAC System	Automatic Control System
B	Metal Forming and Press Tool Design	Automobile Engineering	E -Vehicles	Additive Manufacturing
C	Internal Combustion Engine	Advanced Manufacturing Techniques	Sustainable Manufacturing	Project Management & Operation Research
D	-	-	-	Logistics and Supply Chain Management

List of Open Elective Courses (OECs)

FACULTY	OEC- I BTPESOE02T 04T/13T/30T	OEC- II BTPESOE8T 32T/33T	OEC- III BTPESOE07T 36T/37T
Management, Commerce & Entrepreneurship	Business Communication Digital Marketing and E-Commerce	Python Programming	Industrial Psychology and Organisational Behaviour.
Humanity ,Social Sciences & life Skills	Employability and Skill Development	-	-
Science , Engineering Technology	Applied Mathematics	Application of Drone Technology in Agriculture	Energy Audit and Management Renewable Energy Engineering
Law, Policy & Governance	-	Intellectual Property Rights (IPR)	-

Note: A student may choose another course from the Institute-approved Open Elective Basket.



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*** Annexure**

List of SWAYAM/NPTEL online learning courses

Sr. No	Course Code	Course Name	Duration in weeks	Institute Offering Course	Name of Professor
1	BTPESME701T	Fundamentals of Automotive Systems	12 Weeks	IITM	Prof. C. S. Shankar Ram
2	BTPESME702T	Machinery Fault Diagnosis and Signal Processing	12 Weeks	IITKGP	Prof. Amiya Ranjan Mohanty
3	BTPESME703T	Product Design and Manufacturing	12 Weeks	IITK	Prof. J.Ramkumar Prof. Amandeep Singh
4	BTPESME704T	Advanced Robotics	12 Weeks	IITK	Prof. Ashish Dutta
5	BTPESME705T	Introduction to Machine Learning	12 Weeks	IITM	Prof. Balaraman Ravindran
6	BTPESME706T	Organizational Behaviour	12 Weeks	IIT Hyderabad	Prof. M. P. Ganesh
7	BTPESME707T	Sustainable Power Generation Systems	12 Weeks	IIT Guwahati	Prof. Pankaj Kalita
8	BTPESME708T	Computational Fluid Dynamics	12 Weeks	IIT Kharagpur	Prof. Suman Chakraborty

APPROVED in.....3rd.....
Academic Council Meeting
Dated :-.....13/06/2026.....