



Program Structure

Bachelor of Technology (Mechanical Engineering)

Duration: 04 Years

Batch: 2025-2029

**Department of Mechanical Engineering
School of Engineering and Applied Sciences**

Vision of the University:

To be a global leader in education, research, and innovation, empowering higher learning ecosystem.

Mission of the University:

- Empower all the members of the Bennett ecosystem and provide thought leadership, focus on nation building and prepare our graduates to move with the Times.
- Cultivate international partnerships and collaborations with academic institutions, industry, and government organizations and provide a rigorous and innovative education that equips students with the knowledge, skills, and ethical values required to excel in their careers.
- Foster a culture of lifelong learning, adaptability, and critical thinking, ensuring graduates are prepared to tackle emerging challenges in all academic fields.
- Drive interdisciplinary research and innovation, pushing the boundaries of human knowledge, addressing pressing global issues and solving real world problems.
- Enhance a collaborative environment that encourages faculty and students to engage in research, innovation, and entrepreneurship, creating a lasting impact on society.
- Promote diversity, equity, and inclusion, ensuring that all individuals, regardless of background, feel welcomed, respected, and empowered.
- Prepare students to become global citizens, capable of addressing global challenges and contributing to the well-being of communities worldwide.
- Provide a globally connected career services networking with graduate employers and alumni.
- Foster a strong sense of ethical responsibility in our graduates, emphasizing the importance of ethical conduct, sustainability, and social impact in professional practice.
- Commit to ongoing assessment and improvement of our programs and invest in modern infrastructure and advanced technology to support teaching, research, and innovation adapting to the evolving needs of students, industries, and society.

Vision of the School:

To be a leading centre of excellence in engineering education, research, and innovation, fostering the development of skilled engineers who will shape the future of science and technology and contribute to the betterment of society.

Mission of the School:

1. Provide high-quality science & engineering education: The school is dedicated to delivering rigorous, comprehensive, and contemporary education that equips students with the necessary knowledge, skills, and ethical values to excel in the field of science & engineering.
2. Foster research and innovation: Encourage and support cutting-edge research and innovation in various scientific & engineering disciplines, promoting interdisciplinary collaboration, entrepreneurship skills to address real-world challenges. The school aims to be at the forefront of technological advancements and contribute to the body of knowledge in science & engineering.
3. Promote experiential learning: Create an environment that generate new knowledge with emphasis on hands-on learning experiences, practical applications of scientific & engineering principles, and collaboration with industry partners. The school strives to develop graduates who are ready to tackle real-world problems, promote entrepreneur and adapt to a rapidly evolving engineering landscape.
4. Cultivate professional ethics and social responsibility: Instil in students a strong sense of professional ethics, integrity, and social responsibility. The school aims to produce engineers who are committed to sustainable development, ethical practices, and actively contribute to society's well-being.

Vision of the Department:

- Attract, support, and retain the world class faculty.
- Create the state-of-the-art research and lab facilities.
- Continuously strive for excellence in teaching and student experiences within and beyond Mechanical and Aerospace Engineering.
- Institutionalize and promote a culture of collegiality, collaboration, achievement, and integrity.

Mission of the Department:

The mission of the Department of Mechanical Engineering is to provide high-quality engineering education at the Bachelor's and PhD levels, appropriate to the discipline and consistent with our status as a world class academic leader and research-driven University.

In particular, the elements of our mission are to:

1. Impart our students proficiency in solving engineering problems with professional ethics and serving the global needs of the society.
2. Prepare our students for a global technical career and for advanced study in mechanical engineering, aerospace engineering, or other relevant fields.
3. Impact significant technical, societal, and environmental challenges through innovative and collaborative research, transformative education, and leadership.

Program Educational Objectives (PEO):

1. Graduates will be engaged in ongoing learning and professional development through self-study, continuing education in mechanical engineering and also in other allied fields.
2. Graduates will apply their engineering skills, exhibiting critical thinking and problem solving skills in professional engineering practices or tackle social, technical and business challenges.
3. Graduates will adopt ethical attitude and exhibit effective skills in communication, management, teamwork and leadership qualities.

PEO to Mission Statement Mapping:

Mission Statements →	M1	M2	M3
PEO Statements ↓			
PEO1	2	3	1
PEO2	3	2	1
PEO3	1	2	3

1: Low

2: Medium

3: High

Program Outcomes (POs) and Program Specific Outcomes (PSOs):

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

PO2: 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.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate considerations for public health and safety, and cultural, societal, and environmental considerations.

PO4: 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.

PO5: 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.

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 teamwork: Function effectively as a member or leader in diverse teams and diverse teams, and in multidisciplinary settings.

PO10: 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.

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

PSOs:

PSO1: Effectively build and communicate the solutions using learnings from basic mechanical engineering, basic sciences, mathematics, computational skills and tools.

PSO2: Ability to conduct experiments and simulate real-life problems in engineering using computational techniques and instrumentation; and can work independently in research or industrial environments.

PSO3: Capability to compete with the available employment opportunities and solve complex engineering problems related to production, design, thermal and allied industries using systematic tools, while giving due consideration to the environment protection and sustainability.

Mapping of POs/PSOs to PEOs:

PEO Statements Program Outcomes	PEO1	PEO2	PEO3
PO1	3	2	1
PO2	2	3	1
PO3	1	3	1
PO4	1	3	1
PO5	2	3	1
PO6	1	3	2
PO7	1	3	2
PO8	1	2	3
PO9	1	1	3
PO10	1	1	3
PO11	1	2	3
PO12	3	2	1
PSO1	3	2	3
PSO2	2	3	1
PSO3	1	3	2

1: Low

2: Medium

3: High

DEPARTMENT OF MECHANICAL ENGINEERING
Curriculum for B. Tech Mechanical Engineering Batch 2025-2029

SEMESTER I							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Workshop Practice and Product Realisation	EMEC1001L	3	1	0	4	0
2	Fundamentals of Electrical & Electronics Engineering	EECE1001L	4	2	1	2	0
3	Calculus I & Linear Algebra	ABAI1001L	4	3	1	0	0
4	Introduction to Python Programming	EMEC103P	2	1	0	2	0
5	Professional Skills	USEC1001	2	2	0	0	0
6	Inculcation of Human Values and Professional Ethics	UVAC1001	2	2	0	0	0
7	Community Project and Social Responsibility	UVAC1002	2	2	0	0	0
8	Communication Skills	UAEC1001	2	2	0	0	2
Total Credits in Semester - I			21				
SEMESTER II							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Engineering Statics and Dynamics	EMEC108L	4	3	1	0	0
2	Engineering Graphics and AutoCAD	EMEC118P	2	0	0	4	0
3	Numerical Methods with Applications	EMEC217P	3	2	0	2	0
4	Calculus II & Differential Equations	ABAI1002L	4	3	1	0	0
5	Electromagnetic Waves	EPHY113L	3	2	0	2	0
6	Soft Skills and Personality Development	UAEC1002	2	2	0	0	0
7	Leadership and Management Skills	USEC1002	2	2	0	0	0
8	Environment and Sustainability	UVAC1003	2	2	0	0	0
Total Credits in Semester - II			22				
SEMESTER III							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Manufacturing Processes	2026MECH200	3	3	0	0	0
2	Solid Mechanics	2026MECH201	4	3	1	0	0
3	Engineering Thermodynamics	2026MECH202	4	3	1	0	0
4	Material Testing Lab	2026MECH203	1	0	0	2	0
5	Computer Aided Solid Modelling	2026MECH204	3	1	0	4	0
6	DSE-3 (A-B) [Select from DSE List]	2026MECH248-249	3	2	0	2	0
7	SUMMER INTERNSHIP - I	2026MECH250	0	0	0	0	0
8	Material Science and Engineering	2026MECH154	3	3	0	0	0
9	AI for All	2026AINTXXX	2	1	0	2	0
Total Credits in Semester - III			23				

SEMESTER IV							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Kinematics and Dynamics of Machines	2026MECH251	4	3	1	0	0
2	Advanced Manufacturing Processes	2026MECH252	3	3	0	0	0
3	Fluid Mechanics and Machines	2026MECH253	3	3	0	0	0
4	Manufacturing Processes Lab	2026MECH254	2	0	0	4	0
5	Design of Machine Elements	2026MECH255	4	3	0	2	0
6	DSE-4 (A-B) [Select from DSE List]	2026MECH298/ 2026ERGT298	3	3	0	0	0
7	Engineering Economics	2026ECON151	2	2	0	0	0
	Total Credits in Semester - IV		21				
SEMESTER V							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Heat and Mass Transfer	2026MECH300	3	3	0	0	0
2	Design of Transmission Systems	2026AUTM301	3	2	0	2	0
3	Computational Fluid Dynamics	2026MECH302	4	3	0	2	0
4	Thermo-fluids Lab	2026MECH303	2	0	0	4	0
5	DSE-5 (A-I) [Select from DSE List]	MECH/AERO/ERGT/ ROME/AUTM/PRDD	3	3	0	0	0
6	SUMMER INTERNSHIP - II	2026MECH350	2	0	0	0	6
7	Metrology and Measurement	2026MECH102	3	2	0	2	0
	Total Credits in Semester - V		20				
SEMESTER VI							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Mechatronics and Automation	2026ROME351	4	3	0	2	0
2	Design and Innovation Lab	2026MECH352	2	0	0	4	0
3	Finite Element Method	2026MECH353	4	3	0	2	0
4	Dynamics and Vibration Lab	2026MECH354	2	0	0	4	0
5	DSE-6 (A-C) [Select from DSE List]	MECH/AERO/ERGT/ ROME/AUTM/PRDD	3	3	0	0	0
6	DSE-7 (A-J) [Select from DSE List]	MECH/AERO/ERGT/ ROME/AUTM/PRDD	3	3	0	0	0
7	Innovation & Entrepreneurship	2026IENT351	2	1	0	0	3
	Total Credits in Semester - VI		20				

DEPARTMENT OF MECHANICAL ENGINEERING

List of Discipline Specific Electives for B. Tech Mechanical Engineering

Note: To select electives for a Minor, the students should refer to the list of courses given in the separate sheet of Minor courses.

S. No.	Semester	Name of the Course	Course Code	L	T	P	E	Total Credits
DSE-1 (A)	I	Calculus I & Linear Algebra	2026MATH100	3	1	0	0	4
DSE-1 (B)	I	Engineering Calculus	2026MATH101	3	1	0	0	4
DSE-2 (A)	II	Calculus II & Differential Equations	2026MATH151	3	1	0	0	4
DSE-2 (B)	II	Linear Algebra and Ordinary Differential Equations	2026MATH152	3	1	0	0	4
DSE-3 (A)	III	Probability and Statistics	2026MECH248	2	0	2	0	3
DSE-3 (B)	III	Optimization Techniques	2026MECH249	3	0	0	0	3
DSE-4 (A)	IV	Applied Thermodynamics	2026MECH298	3	0	0	0	3
DSE-4 (B)	IV	Energy Systems and Technologies	2026ERGT298	3	0	0	0	3
DSE-5 (A)	V	Fundamentals of Aerospace Engineering	2026AERO343	3	0	0	0	3
DSE-5 (B)	V	Non-conventional Energy Resources	2026ERGT343	3	0	0	0	3
DSE-5 (C)	V	Introduction to Robotics	2026ROME343	3	0	0	0	3
DSE-5 (D)	V	Industrial Engineering	2026PRDD343	3	0	0	0	3
DSE-5 (E)	V	Basic Elements of Automotive systems	2026AUTM343	3	0	0	0	3
DSE-5 (F)	V	Basic Elements of Electric Vehicles	2026MECH344	3	0	0	0	3
DSE-5 (G)	V	Precision Engineering	2026MECH345	3	0	0	0	3
DSE-5 (H)	V	Introduction to Bioengineering	2026MECH346	3	0	0	0	3
DSE-5 (I)	V	Internal Combustion Engines	2026MECH347	3	0	0	0	3
DSE-6 (A)	VI	Mechanical Vibrations	2026AERO383	3	0	0	0	3
DSE-6 (B)	VI	Advanced Mechanisms	2026ROME383	3	0	0	0	3
DSE-6 (C)	VI	Applied Ergonomics	2026PRDD383	3	0	0	0	3
DSE-7 (A)	VI	Aerospace Structural Mechanics	2026AERO384	3	0	0	0	3
DSE-7 (B)	VI	Energy Storage Systems	2026ERGT384	3	0	0	0	3
DSE-7 (C)	VI	Sensors and Actuators	2026ROME384	3	0	0	0	3
DSE-7 (D)	VI	Quality and Reliability Engineering	2026PRDD384	3	0	0	0	3

DSE-7 (E)	VI	Battery Management System	2026AUTM384	3	0	0	0	3
DSE-7 (F)	VI	Operations Research	2026MECH385	3	0	0	0	3
DSE-7 (G)	VI	Power Plant Engineering	2026MECH386	3	0	0	0	3
DSE-7 (H)	VI	Refrigeration and Air-Conditioning	2026MECH387	3	0	0	0	3
DSE-7 (I)	VI	CNC Machines and Programming	2026MECH388	2	0	2	0	3
DSE-7 (J)	VI	Product Life Cycle Management	2026MECH389	3	0	0	0	3
DSE-8 (A)	VII	Compressible flow & Jet Propulsion	2026AERO441	2	0	2	0	3
DSE-8 (B)	VII	Hydrogen Energy and Fuel Cells	2026ERGT441	3	0	0	0	3
DSE-8 (C)	VII	Control Theory	2026ROME441	3	0	0	0	3
DSE-8 (D)	VII	Rapid Prototyping	2026PRDD441	3	0	0	0	3
DSE-8 (E)	VII	Chassis System Design	2026AUTM441	3	0	0	0	3
DSE-8 (F)	VII	Microelectromechanical systems	2026MECH442	3	0	0	0	3
DSE-8 (G)	VII	Dynamics of Multi body Systems	2026MECH443	2	0	2	0	3
DSE-8 (H)	VII	Advanced Solid Mechanics	2026MECH444	3	0	0	0	3
DSE-8 (I)	VII	Engineering Failure Analysis	2026MECH445	3	0	0	0	3
DSE-9 (A)	VII	Theory of Elasticity & Plasticity	2026AERO446	3	0	0	0	3
DSE-9 (B)	VII	Energy Economics, Policy, and Regulations	2026ERGT446	3	0	0	0	3
DSE-9 (C)	VII	AI for Robotics	2026ROME446	3	0	0	0	3
DSE-9 (D)	VII	Design for Sustainability	2026PRDD446	3	0	0	0	3
DSE-9 (E)	VII	Vehicle Dynamics	2026AUTM446	3	0	0	0	3
DSE-9 (F)	VII	Unconventional Machining Processes	2026MECH447	3	0	0	0	3
DSE-9 (G)	VII	Design of Experiments	2026MECH448	3	0	0	0	3
DSE-9 (H)	VII	Image Processing	2026MECH449	3	0	0	0	3
DSE-10 (A)	VIII	Level-6 course on Aerospace Engineering from ONLINE MODE	2026AERO498	0	0	0	9	3
DSE-10 (B)	VIII	Level-6 course on Energy Technologies from ONLINE MODE	2026ERGT498	0	0	0	9	3
DSE-10 (C)	VIII	Level-6 course on Robotics and Mechatronics from ONLINE MODE	2026ROME498	0	0	0	9	3
DSE-10 (D)	VIII	Level-6 course on Product Design and Development from ONLINE MODE	2026PRDD498	0	0	0	9	3
DSE-10 (E)	VIII	Level-6 course on Automotive Technologies from ONLINE MODE	2026AUTM498	0	0	0	9	3

DEPARTMENT OF MECHANICAL ENGINEERING

List of Courses for Minor in the respective domains

Note: To earn a Minor alongside the Major in Mechanical Engineering, the student must complete minimum 32 credits from the respective domains. The list of courses for each Minor are given below. The asterisk ‘*’ marked courses must be certified by the Department for its relevance to the selected domain for fulfilling the minimum 32 credits required to get Minor.

Name of the Minor	Semester	Name of the course	New Course Code	L	T	P	E	Credits
Aerospace Engineering	V	Fundamentals of Aerospace Engineering	2026AERO343	3	0	0	0	3
	VI	Mechanical Vibrations	2026AERO383	3	0	0	0	3
	VI	Aerospace Structural Mechanics	2026AERO384	3	0	0	0	3
	VII	Compressible flow & Jet Propulsion	2026AERO441	2	0	2	0	3
	VII	Theory of Elasticity & Plasticity	2026AERO446	3	0	0	0	3
	VII*	Modeling, Simulation and Engineering Research	2026MECH400	0	0	8	0	4
	VIII*	Level-6 course on Aerospace Engineering from NPTEL/ SWAYAM/Coursera, with the approval of the Department		3	0	0	0	3
	VIII*	Research Project/ Dissertation	2026MECH499	0	0	0	36	12
	Note: The asterisk marked courses must be certified by the Department for its relevance to the domain for the minimum 32 credits for earning Minor in Aerospace Engineering.						Total Credits	34

Name of the Minor	Semester	Name of the course	New Course Code	L	T	P	E	Credits
Energy Technologies	IV	Energy Systems and Technologies	2026ERGT298	3	0	0	0	3
	V	Non-conventional Energy Resources	2026ERGT343	3	0	0	0	3
	VI	Energy Storage Systems	2026ERGT384	3	0	0	0	3
	VII	Hydrogen Energy and Fuel Cells	2026ERGT441	3	0	0	0	3
	VII	Energy Economics, Policy, and Regulations	2026ERGT446	3	0	0	0	3
	VII*	Modeling, Simulation and Engineering Research	2026MECH400	0	0	8	0	4
	VIII*	Level-6 course on Energy Technologies from NPTEL/ SWAYAM/Coursera, with the approval of the Department		3	0	0	0	3
	VIII*	Research Project/ Dissertation	2026MECH499	0	0	0	36	12
	Note: The asterisk marked courses must be certified by the Department for its relevance to the domain for minimum 32 credits for earning Minor in Energy Technologies.						Total Credits	34

Name of the Minor	Semester	Name of the course	New Course Code	L	T	P	E	Credits
Robotics and Mechatronics	V	Introduction to Robotics	2026ROME343	3	0	0	0	3
	VI	Mechatronics and Automation	2026ROME351	3	0	2	0	4
	VI	Advanced Mechanisms	2026ROME383	3	0	0	0	3
	VI	Modern Robotics and Autonomous Systems with ROS	2026ROME384	3	0	0	0	3
	VII	Control Theory	2026ROME441	3	0	0	0	3
	VII	AI for Robotics	2026ROME446	3	0	0	0	3
	VII*	Modeling, Simulation and Engineering Research	2026MECH400	0	0	8	0	4
	VIII*	Level-6 course on Robotics and Mechatronics from NPTEL/ SWAYAM/Coursera, with the approval of the Department		3	0	0	0	3
	VIII*	Research Project/ Dissertation	2026MECH499	0	0	0	36	12
	Note: The asterisk marked courses must be certified by the Department for its relevance to the domain for minimum 32 credits for earning Minor in Robotics and Mechatronics.						Total Credits	38

Name of the Minor	Semester	Name of the course	New Course Code	L	T	P	E	Credits
Product Design and Development	V	Industrial Engineering	2026PRDD343	3	0	0	0	3
	VI	Applied Ergonomics	2026PRDD383	3	0	0	0	3
	VI	Quality and Reliability Engineering	2026PRDD384	3	0	0	0	3
	VII	Rapid Prototyping	2026PRDD441	3	0	0	0	3
	VII	Design for Sustainability	2026PRDD446	3	0	0	0	3
	VII*	Modeling, Simulation and Engineering Research	2026MECH400	0	0	8	0	4
	VIII*	Level-6 course on Product Design and Development from NPTEL/ SWAYAM/ Coursera, with the approval of the Department		3	0	0	0	3
	VIII*	Research Project/ Dissertation	2026MECH499	0	0	0	36	12
	Note: The asterisk marked courses must be certified by the Department for its relevance to the domain for minimum 32 credits for earning Minor in Product Design and Development.						Total Credits	34

Name of the Minor	Semester	Name of the course	New Course Code	L	T	P	E	Credits
Automotive Technologies	V	Design of Transmission Systems	2026AUTM301	2	0	2	0	3
	V	Basic Elements of Automotive systems	2026AUTM343	3	0	0	0	3
	VI	Battery Management System	2026AUTM384	3	0	0	0	3
	VII	Chassis System Design	2026AUTM441	3	0	0	0	3
	VII	Vehicle Dynamics	2026AUTM446	3	0	0	0	3
	VII*	Modeling, Simulation and Engineering Research	2026MECH400	0	0	8	0	4
	VIII*	Level-6 course on Automotive Technologies from NPTEL/SWAYAM/Coursera, with the approval of the Department		3	0	0	0	3
	VIII*	Research Project/ Dissertation	2026MECH499	0	0	0	36	12
	Note: The asterisk marked courses must be certified by the Department for its relevance to the domain for minimum 32 credits for earning Minor in Automotive Technologies.						Total Credits	34