Course Curriculum for Integrated B. Tech in Mechanical Engineering (Specialisation in CAD/CAM)

অসম দক্ষতা বিশ্ববিদ্যালয়
Assam Skill University
A Government of Assam University

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About the Department

The Department of Mechanical Engineering under the School of Manufacturing and Construction at Assam Skill University started its academic session from the year 2025-26. It is one of the relatively new departments established to address the skill gap and promote vocational education in the state of Assam, India. The main objective of the department is to make the students practically skilled along with strengthening the academic and technical knowledge, industry-relevant knowledge through various technologies, teaching-learning activities. The department is also prioritizing industry collaborations and on-job-training to the student to explore latest technologies and practices in the field. The department is well equipped with centre of excellence and state of the art laboratories and has highly qualified, dedicated and experienced faculty and staff members. Through holistic approach to education, the department aims to empower individuals to succeed in a dynamic and globally competitive environment.

Vision

To be a pioneering Department of Mechanical Engineering at Assam Skill University, committed to excellence in skill-based education, research, and innovation, nurturing globally competitive professionals and contributing to the socio-economic development of the region

Mission

- ☞ Provide skill-centric education that integrates theoretical knowledge with practical applications and problem-solving skills required to excel in the field of Mechanical Engineering.
- ☞ Develop and implement a dynamic and industry-relevant curriculum that aligns with current and emerging trends in Mechanical Engineering to meet the demands of the global workforce.
- ☞ Fostering experiential learning opportunities through hands-on projects, internships, and industrial training programs which will help students to gain real-world experience of mechanical engineering.
- ☞ Cultivate a culture of research and innovation within the department, encouraging faculty and students to engage in cutting-edge research projects.
- ☞ Establish industry collaborations to facilitate knowledge exchange, technology transfer for the benefit of both academia and the industry.
- ☞ Promote ethical practices, environmental sustainability leading a sense of ethics and environmental consciousness.
- ☞ Promote professional development of our students by providing opportunities for leadership, entrepreneurship and empowering them to successful careers in Mechanical Engineering.
- ☞ Actively engage with the community through local challenges and contribute to the overall development and well-being of society.

- ☞ By adhering to our vision and mission, the Department of Mechanical Engineering at Assam Skill University aims to emerge as a centre of excellence in skill-based education and research, producing competent and socially responsible Mechanical Engineers who are capable of making significant contributions to the advancement of society and the economy.

Disciplinary Knowledge (DK) and Attitude Profile

DKs define what knowledge is required to achieve the Program Outcomes.

Disciplinary Knowledge (DK) and Attitude Profiles are part of the Graduate Attributes framework that supports the attainment of Program Outcomes (POs). Attitude Profiles refer to the professional attitudes, ethics, and values expected from graduates. These are often linked with ethics, lifelong learning, team work, leadership and Environmental and societal responsibility.

DK1: A descriptive, formula-based understanding of the natural sciences applicable in a subdiscipline and awareness of directly relevant social sciences.

DK2: Procedural mathematics, numerical analysis, statistics applicable in a sub discipline.

DK3: A coherent procedural formulation of engineering fundamentals required in an accepted sub-discipline.

DK4: Engineering specialist knowledge that provides the body of knowledge for an accepted sub-discipline.

DK5: Knowledge that supports engineering design and operations based on the techniques and procedures of a practice area.

DK6: Codified practical engineering knowledge in recognized practice area.

DK7: Knowledge of issues and approaches in engineering technician practice, such as public safety and sustainable development.

DK8: Engagement with the current technological literature of the practice area.

DK9: Ethics, inclusive behaviour and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

Program Outcomes (POs)

POs define what students should be able to do (skills, competencies, abilities).

List of Program Outcomes

PO1: Apply knowledge of mathematics, natural sciences, engineering fundamentals, and an engineering specialisation (as specified in DK1 to DK4) to a wide range of practical procedures and practices.

PO2: Identify and analyse well-defined engineering problems and reach substantiated conclusions using codified methods of analysis specific to their field of activity (DK1 to DK4).

PO3: Design solutions for well-defined technical problems and assist in the design of systems, components, or processes to meet specified needs, with appropriate consideration for public health and safety, as well as cultural, societal, and environmental factors (DK5).

PO4: Conduct investigations of well-defined problems by locating and search relevant codes and catalogues, and by conducting standard tests and measurements (DK8).

PO5: Apply appropriate techniques, resources, and modern computing, engineering and IT tools to well-defined engineering problems, while being aware of their limitations (DK2 and DK6).

PO6: When solving well-defined engineering problems, evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks, and the environment (DK1, DK5, and DK7).

PO7: Understand and commit to professional ethics and the norms of technician practice, including compliance with relevant laws. Demonstrate an understanding of the need for diversity and inclusion (DK9).

PO8: Function effectively as an individual, and as a member or leader in diverse and inclusive teams, in multidisciplinary face-to-face/remote/distributed settings (DK9).

PO9: Communicate effectively and inclusively on well-defined engineering activities with the engineering community and society at large by comprehending the work of others, documenting one's own work, and giving and receiving clear instructions.

PO10: Demonstrate awareness of engineering management principles as a member or leader of a technical team and apply them to manage projects in multidisciplinary environments.

PO11: Recognize the need for, and have the ability for independent updating in the face of specialized technical knowledge (DK8).

Duration of the course = 3 + 3 years

Number of seats

Total number of seats = 30

Eligibility for the course

1) Candidates must have studied Mathematics and Science in Class 10.
   Minimum 40% marks in aggregate (35% for reserved categories as per Government of Assam norms).
2) Physical Fitness
   A candidate must be physically and mentally fit. The candidate will have to produce Fitness Certificate at the time of Admission from a registered medical practitioner.
3) Reservations
   Reservation for filling up the seats will be as per the Govt. of Assam rules

Highlights of the Course

1) Collaboration with L&T EduTech for the delivery of both theory and practical

classes, ensuring strong industry integration.

2) Extensive laboratory sessions with high engagement hours to enhance hands-on learning and practical skills.
3) One-month industry internship in the 3rd semester to provide real-world exposure.
4) Full-semester (5th semester) On-the-Job Training (OJT) in industries to develop professional competencies and workplace readiness.

Exit and Lateral Entry Option

1) Exit after one year: NSQF Level 4.5 Certificate
2) Exit after two years: NSQF Level 5 Certificate or Advanced Certificate
3) Diploma Holder can join 2nd year B. Tech (Lateral Entry) if eligible as per university and AICTE norms

Advanced Technical Skills

Upon successful completion of the course, students will be equipped with the following advanced technical skills:

1) Computer-Aided Design (CAD) of mechanical components and assemblies.
2) CNC programming for precision manufacturing applications.
3) CNC machining of complex components with high accuracy and superior surface finish.
4) Application of advanced welding techniques in industrial contexts.
5) Materials characterisation using high-accuracy measurement and testing instruments.

Job Prospects

Upon successful completion of the course, students will have opportunities to work at the supervisory and technical levels in the following sectors:

Key Job Roles:

1) CNC Programmer / CNC Supervisor
2) Production Supervisor / Production Engineer
3) Tool Room Engineer / Tool & Die Supervisor
4) Quality Control / Quality Assurance Inspector
5) Maintenance Supervisor (Mechanical Systems)
6) Welding Supervisor / Fabrication Engineer

Relevant Industry Sectors:

1) Precision manufacturing industries
2) Tool and die making industries
3) Automobile sector
4) Mechanical systems and equipment industries
5) General manufacturing industries

Course Structure

Semester – I			
Sl. No.	Course type	Subject Code	Subject Title
1	**BSC**	**BS-101**	Engineering Mathematics-I
2	**BSC**	**BS-102**	Engineering Physics-I
3	**BSC**	**BS-103**	Engineering Chemistry
4	**HSMC**	**HSM-101**	English Communication
5	**ESC**	**ES-101**	Engineering Graphics and Design **(L&T EduTech)**
6	**ESC**	**ES-102**	Workshop Practice-I
7	**MNC-AU**	**MNC-AU-101**	NCC/NSS/ Yoga/Sports

Semester – II			
Sl. No.	Course type	Subject Code	Subject Title
1	**BSC**	**BS-201**	Engineering Mathematics-II
2	**BSC**	**BS-202**	Engineering Physics-II
3	**ESC**	**ES-201**	Digital Enablement Basics for Engineers **(L&T EduTech)/ (**IT Lab)
4	**ESC**	**ES-202**	Engineering Mechanics
5	**ESC**	**ES-203**	Basic Electrical and Electronics Engineering
6	**LC**	**LC-201**	Workshop Practice-II

Semester – III			
Sl. No.	Course type	Subject Code	Subject Title
1	**PCC**	**DMPC-301**	Strength of Materials
2	**PCC**	**DMPC-302**	Manufacturing Technology **(L&T EduTech)/ (**Advanced Manuf. Lab-I)
3	**PCC**	**DMPC-303**	Materials Science and Engineering
4	**PCC**	**DMPC–304**	Engineering Metrology
5	**PCC**	**DMPC-305**	Machine and Assembly Drawing
6	**PEC**	**DMPE-301**	1. Fluid Mechanics and Hydraulic Machines 2. Machine Tool Design

7	**INT**	**Internship**	INTERNSHIP

Semester – IV			
Sl. No.	Course type	Subject Code	Subject Title
1	PCC	DMPC-401	CNC Programming & Machining
2	PCC	DMPC-402	Theory of Machines
3	PCC	DMPC–403	Additive Manufacturing (L&T EduTech)
4	PEC	DMPE-401	1. Manufacturing Methods / (Advanced Manuf. Lab-II) 2. Basic Engineering Design
5	PEC	DMPE-402	1. Heavy Manufacturing Engineering (L&T EduTech) 2. Renewable Energy Sources
6	HSMC	HSM-401	Entrepreneurship and Start-up
7	PR	PR-401	Mini Project

Semester - V			
Sl. No.	Course type	Subject Code	Subject Title
1	OJT	OJT-501	On the Job Training (OJT)
2	IKS	IKS-501	Indian Knowledge System
3	MNC-AU	MNC-AU-501	Constitution of India

Semester - VI			
Sl. No.	Course type	Subject Code	Subject Title
1	PCC	DMPC-601	Digital Technologies with CPS, IIOT and Cloud in Manufacturing (L&T EduTech)
2	PEC	DMPE-601	1. Ambience Control Systems (L&T EduTech) (with HVAC Lab) 2. Operations Research
3	MOPEC	DMOPE-601	1. Collaborative Robotics in Manufacturing with AI, ML and IIoT (L&T EduTech) 2. Mechatronics
4	MOPEC	DMOPE-602	1. Non-Traditional Manufacturing Processes 2. Advance Welding Technology
5	MNC-AU	MNC-AU–601	Environmental Science
6	PR	PR-601	Major Project

Credit Breakup

Sl. No.	Category	Credit Breakup
1	Humanities and Social Sciences including Management courses	05
2	Basic Science courses	20
3	Engineering Science courses including workshop, drawing, basics of electronics/electrical/mechanical/ computer etc.	19
4	Professional core courses	34
5	Professional Elective courses relevant to chosen specialization/ branch + Laboratory Course	13
6	Open subjects – Electives from other technical and /or emerging subjects	06
7	Project work, seminar and internship/OJT in industry or elsewhere	31
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Knowledge Tradition]	(non-credit)
Total		**128**