



SCHOOL OF ENGINEERING & TECHNOLOGY

COURSE FILE

Program: Mechanical Engineering

Course Code: MEC 2734

Course Title: CAD

Module Semester: {{Module/Semester}}

Session: {{Session}}

Index

S. No.	Topics
1.	Course Details: Course-Code; Course Title; Semester/Term/Module; Year
2.	Vision, Mission of the University
3.	Graduate Attributes of the BMU Students
4.	Vision, Mission of the School
5.	PEOs and POs & PSOs of the Program
6	Course Description and its objectives
7	Course Outcomes and CO-PO Mapping
8	Course Syllabus: (including Course Content with Module-wise teaching hours allocated; Readings, Activities, Teaching Strategy, and Module mapped to COs, Text Book(s), Reference Books, Other learning resources)
9	Detailed Session wise Plan
10	Weekly Timetable
11	Registered Students List
12	Details of Internal Assessments; weightages, due dates, mapping to CO
13	Mid Semester Question papers with sample solutions
14	Sample Evaluated Internal Submissions and Identification of weak students.
15	Reflections from the Mid-term semester feedback received, and interventions made to enhance the student learning and continuous improvement in teaching and learning strategies.

16	Interventions made for slow performers and advanced learners, highlighting initiatives taken for student improvements (retest, resubmissions etc.)
17	End Semester Question papers with sample solutions
18	Detail of Marks in all components up to the End Semester
19	Attendance Report
20	Final record of Results (including the grades)
21	Analyzing Direct Feedback received on Course Outcomes
22	CO Attainment Measurement Analysis
23	Interventions made for slow performers and advanced learners, highlighting initiatives taken for student improvements (retest, resubmissions etc.)
24	End Semester Question papers with sample solutions
25	Feedback (class committee or otherwise) and corrective actions (if any)
26	Faculty Course Review (if any, like Use of Innovative Pedagogies; Technology; Experiential Learning; Integration with the Vision and Mission of the University; Feedback; Course Outcome attainment for the next run of the course)
27	Any other additional information

1. Course Details

- Course Code: MEC 2734
- Course Title: CAD
- **Module/Semester:** {{Module/Semester}}
- **Session:** {{Session}}

2. Vision, Mission of the University

Vision

BML Munjal University seeks to nurture ethical leaders who are skilled, knowledgeable and have the life skills required for leading their organizations to success. The university shall seek the advancement and dissemination of practically oriented knowledge benchmarked with the best global standards.

Mission

BML Munjal University aims to be a leading university for the quality and impact of its teaching, research and linkages with major stakeholders. The focus of the university is to find creative solutions to problems through application of knowledge. The university aims to create a talented community of students and faculty who excel in teaching, learning and research, in a creative and stimulating environment. The university will collaborate with other institutions for development of science, technology and arts in the global context.

3. Graduate Attributes

- Acquire and apply practical understanding of discipline knowledge.
- Demonstrate a sense of ethics and display excellence in both personal and professional life.
- Exhibit problem solving, critical thinking skills and investigative capability to address real world problems.
- Manifest leadership qualities and work effectively in teams across globally diverse environments.
- Be a lifelong learner with an entrepreneurial mindset to innovate in the constantly changing global scenario.
- Possess a strong sense of inquiry and design innovative solutions for positive societal impact.
- Be effective communicators and possess an empathetic outlook.

4. Vision, Mission of the School

Vision of School:

To be amongst the leading engineering schools of the country recognized globally for excellence in teaching and research with focus on experiential learning, innovation and entrepreneurship.

Mission of School:

- * Providing high-quality learning experience to our students, preparing them to be global leaders, and contributing to the development of society through research, innovation, and entrepreneurship.
- * Creating an inclusive and diverse learning environment that fosters creativity, critical thinking, and ethical values.
- * Collaborating with industry, government, and other institutions to address complex societal challenges and promote sustainable development.

5. PEOs and POs & PSOs of the Program

Program Educational Objectives (PEO):

PEO 1: Analyze the mechanical systems with design engineering, thermal engineering, manufacturing and allied engineering concepts by applying mathematics and sciences.

PEO 2: Demonstrate multi-disciplinary knowledge to analyze, interpret and create solutions to the real-life mechanical engineering problems.

PEO 3: Embrace capability to expand horizons beyond engineering for creativity, innovation and entrepreneurship.

PEO 4: Imbibe ethics and professionalism to act responsibly towards social and environmental issues with a focus on welfare of humanity.

Program Outcomes (PO):

PO1: Apply the knowledge of mathematics, science, and engineering fundamentals to solve complex problems in the different mechanical engineering fields.

PO2: Identify, formulate, review, and analyse complex engineering problems by using appropriate mathematical and scientific methods, tools and techniques to evaluate solutions and reach substantiated conclusions by using the domain knowledge of mechanical engineering.

PO3: Design appropriate mechanical systems and prototypes through analysis of various components by working within the constraints which may include parameters encompassing social, economic, environmental, health and safety, manufacturability and sustainability components.

PO4: 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 related to mechanical engineering problems.

PO5: Apply appropriate techniques and tools to solve complex mechanical engineering problems by effective usage of IT resources with an understanding of the limitations.

PO6: Apply contextual knowledge and appropriate reasoning to assess societal, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Understand the impact of the mechanical engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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

PO9: Function effectively as a reliable and responsible individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communicate effectively on complex engineering activities specifically with the vast engineering community and in general with the society at large and should be able to comprehend and write effective reports and design documentation, make effective presentations using various tools, and give out and receive clear instructions.

PO11: Demonstrate knowledge and understanding of the mechanical engineering area as well as in all interdisciplinary engineering fields and should be able to effectively apply management principles to

manage large-scale projects.

PO12: Recognize the need for and importance of learning advanced technologies and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change through both online and offline modes.

Program Specific Outcomes (PSO):

PSO1: Demonstrate mechanical engineering knowledge to understand, design, apply and solve engineering problems related to the Automobile sector.

PSO2: Analyse and design manufacturing automation, robotics, and mechatronic systems within realistic constraints.

6. Course Description and its objectives

This course for undergraduate students of Mechanical engineering aims to discuss basic concepts of Computer Aided Design/ Drafting (CAD). The course will impart technical understanding of CAD systems & their application to the students. The course endeavors to deliver basic learning about transformations and geometric modelling techniques used in different CAD systems, covering wireframe, surface & solid modelling techniques and data exchange standards with application to CAM.

7. Course Outcomes and CO-PO Mapping

Course Outcomes:

CO1: Apply understanding & Knowledge of basic sciences, computer and math to learn CAD systems & capabilities.

CO2: Analyze 2-D and 3-D CAD modeling methods and techniques.

CO/PO Mapping:

Course Outcomes (CO)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3												
CO2		3	2	2	2	3	3						

8. Course Syllabus

Sr. No.	Content	CO	Sessions
1	Introduction to CAD: Product life cycle management (PLM) & importance of CAD in PLM, basic architecture of CAD systems & its effective use in geometric modeling.	1	4
2	Geometric transformations: 2-D & 3-D transformations.		4
3	Geometric modeling: Introduction to Wireframe modeling, Surface modeling & Solid modeling with view & Control via sketch planes, geometric aid & manipulation tools.		6
4	Wireframe modeling (Introduction, parametric & non-parametric formulation, and application): Analytic type: Point, Straight lines, Arc, Circles, Ellipse, Parabola, hyperbola & Synthetic type: Hermite cubic spline, Bezier curves, B-spline curves & non-uniform rational B-splines.		4
5	Surface modeling (analytical & synthetic): plane surface, ruled surface, surface of revolution, tabulated surface, Hermite Bi-cubic surface, Bezier surface, B-spline surface & coons' surface.		4
6	Solid modeling: Boundary representation (BREP), Constructive solid geometry (CSG), Sweep representation, Primitive instancing, Cell decomposition & Analytical solid modeling.		4
7	Data exchange standards (LAB): IGES, STEP & STL translators, preprocessors and postprocessors, translator testing for correct data conversion and Tool path generation from CAD system.		3

9. Learning Resources

Text Books:

- ✓ Computer-Aided Design and Drafting
- ✓ Introduction to CAD Systems

Reference Links:

10. Weekly Timetable

Time	Monday	Tuesday	Wednesday	Thursday	Friday
9:15-10:10					
10:15-11:10					
11:15-12:10					
12:15-13:10					
13:15-14:10					
14:15-15:10					
15:15-16:10					
16:15-17:10					
17:15-18:10					

13. Student Learning Categories

No student performance data available.

14. Actions taken for weak students

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