

Bharati Vidyapeeth Deemed University
College of Engineering, Pune- 411043

The Structure of the Curriculum: 2015 Course
Choice Based Credit System (CBCS)

M. TECH. MECHANICAL: SEMESTER- I to IV



Bharati Vidyapeeth University
College of Engineering, Pune
Department of Mechanical
Engineering



Vision of the Bharati Vidyapeeth (Deemed to be University) College of Engineering is:

To be a World Class Institute for Social Transformation through Dynamic Education

Missions of the Bharati Vidyapeeth (Deemed to be University) College of Engineering are:

- *To provide quality technical education with advanced equipment, qualified faculty members, infrastructure to meet needs of profession & society.*
- *To provide an environment conducive to innovation, creativity, research and entrepreneurial leadership.*
- *To practice and promote professional ethics, transparency and accountability for social community, economic & environmental conditions.*

Goals of the Bharati Vidyapeeth (Deemed to be) University College of Engineering are:

- *Recruiting experienced faculty.*
- *Organizing faculty development programs.*
- *Identifying socio-economically relevant areas & emerging technologies.*
- *Constant review & up gradation of curricula.*
- *Up gradation of laboratories, library & communication facilities.*
- *Collaboration with industry and research & development organizations.*
- *Sharing of knowledge, infra-structure and resources.*
- *Training, extension, testing and consultancy services.*
- *Promoting interdisciplinary research.*

Vision of the Mechanical Engineering Department is:

To develop, high quality Mechanical Engineers through dynamic education to meet social and global challenges.

Mission Statements of the Mechanical Engineering Department are:

- *To provide extensive theoretical and practical knowledge to the students with well-equipped laboratories and ICT tools through motivated faculty members.*
- *To inculcate aptitude for research, innovation and entrepreneurial qualities in students.*
- *To acquaint students with ethical, social and professional responsibilities to adapt to the demands of working environment.*

Program Educational Objectives (PEOs) of the B. Tech. Mechanical are:

Graduates will be able,

- *To fulfill need of industry and society with theoretical and practical knowledge.*
- *To engage in research, innovation, lifelong learning and continued professional development.*
- *To fulfill professional ethics and social responsibilities.*

PROGRAM OUTCOMES

Engineering Graduates will be able to:

- 1. Engineering knowledge:** *Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.*
- 2. Problem analysis:** *Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.*
- 3. Design/development of solutions:** *Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.*
- 4. 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.*
- 5. Modern tool usage:** *Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities 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 engineering practice.*
- 9. Individual and team work:** *Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.*
- 10. 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.*
- 11. Project management and finance:** *Demonstrate knowledge and understanding of the 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: *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.*

Statements of Programme Specific Outcomes (PSOs)

PSO1: Apply the knowledge of thermal, design, manufacturing engineering and computational sciences to solve Mechanical Engineering problems.

PSO2: Apply Mechanical Engineering principles for research, innovation and develop entrepreneurial skills.

PSO3: Apply concepts of mechanical engineering to assess societal, environmental, health and safety issues with professional ethics.

Rules for Conducting Tests

Mode of the test

- In each semester for each subject two tests shall be conducted. The schedule for the same will be declared at the commencement of academic year in the academic calendar.
- Each test shall carry 20 marks.
- University examination pattern has given weightage of 20 marks for the tests.
- To calculate these marks following procedure is followed:
 - i) Average marks obtained in two tests shall be considered as provisional marks obtained by the student in the tests.
 - ii) If the candidate appears only for one test during the semester, to calculate the marks obtained in the tests it will be considered that the candidate has got 0 (zero) marks in other test.
 - iii) The provisional marks obtained by the candidate in class tests should reflect as proportional to theory marks. In cases of disparity of more than 15% it will be scaled down accordingly; these marks will be final marks obtained by the student. No scaling up is permitted.
 - iv) If the candidate is absent for theory examination or fails in theory examination his final marks for tests of that subject will not be declared. After the candidate clears the theory, the provisional marks will be finalized as above.
- Paper pattern for tests
 - i) All questions will be compulsory with weightage as following
 - Question 1 - 7 marks
 - Question 2 - 7 marks
 - Question 3 - 6 Marks
 - ii) There will not be any sub-questions.
- For granting the term it is mandatory to appear for both tests conducted in each semester.
- Roll nos. allotted to students shall be the examination nos. for the tests.

Bharati Vidyapeeth University
College of Engineering
Department of Mechanical Engineering
M.Tech. (CAD/CAM) CBCS 2015 Course

Semester I										Total Duration: 24 Hrs/Week Total Marks: 500 Total Credits: 20	
Subjects	Teaching Scheme (Hrs) Hrs/Week		Examination Scheme (Marks)						Examination Scheme (Credits)		Total Credits
	L	P	Theory	Unit Test	Attendance	Tutorial /Assignments	TW	Pract/Orals	TH	TH/PR/OR	
Computer Aided Design	4	4	60	20	10	10	-	50	4	2	6
Modeling and Simulation	4	4	60	20	10	10	-	50	4	2	6
Computer Integrated Manufacturing	4	-	60	20	10	10	-	-	4	-	4
Product Design and Development	4	-	60	20	10	10	-	-	4	-	4
Total	16	8	240	80	40	40	-	100	16	4	20

Semester II										Total Duration: 24 Hrs/Week Total Marks: 500 Total Credits: 20	
Subjects	Teaching Scheme (Hrs) Hrs/Week		Examination Scheme (Marks)						Examination Scheme (Credits)		Total Credits
	L	P	Theory	Unit Test	Attendance	Tutorial /Assignments	TW	Pract/Orals	TH	TH/PR/OR	
Advanced Finite Element Methods	4	4	60	20	10	10	-	50	4	2	6
Control Systems	4	4	60	20	10	10	-	50	4	2	6
Precession Engineering	4	-	60	20	10	10	-	-	4	-	4
Optimization for Engineering Design	4	-	60	20	10	10	-	-	4	-	4
Total	16	8	240	80	40	40	-	100	16	4	20

Semester III									Total Duration:24 Hrs/Week Total Marks:375 Total Credits:34		
Subjects	Teaching Scheme (Hrs) Hrs/Week		Examination Scheme (Marks)						Examination Scheme (Credits)		Total Credits
	L	P	Theory	Unit Test	Attendance	Tutorial /Assignments	TW	Pract/Orals	TH	TH/PR/OR	
Elective I	4	-	60	20	10	10	-	-	4	-	4
Elective II	4	-	60	20	10	10	-	-	4	-	4
Self-Study paper I	4	-	60	20	10	10	-	-	4	-	4
Dissertation Stage I	-	7	-	-	-	-	25	25	-	15	15
Seminar	-	5	-	-	-	-	25	-	-	7	7
Total	12	12	180	60	30	30	50	25	12	22	34

Elective I

1. Advanced Stress analysis
2. Manufacturing Information Systems
3. Computational Fluid Dynamics
4. Micro-electro Mechanical Systems

Elective II

1. Composite Materials
2. Analysis and Synthesis of Mechanisms
3. Artificial Intelligence
4. Design of Experiment

Self-Study Paper I

1. Advanced Manufacturing Processes
2. Machine Condition Monitoring and Diagnostics
3. Product Lifecycle Management
4. Robust Design of Product & Process
5. Computer Aided Process Planning
6. Flexible Manufacturing System
7. Product Design & Process Planning
8. Experimental Technique and Data analysis
9. Tribology in Design
10. Manufacturing System and Simulation

Semester IV									Total Duration: 14 Hrs/Week Total Marks: 325 Total Credits:36		
Subjects	Teaching Scheme (Hrs) Hrs/Week		Examination Scheme (Marks)						Examination Scheme (Credits)		Total Credits
	L	P	Theory	Unit Test	Attendance	Tutorial /Assignments	TW	Pract/Orals	TH	TH/PR/OR	
Self-Study paper II	4	-	60	20	10	10	-	-	4	-	4
Dissertation Stage II	-	10	-	-	-	-	150	75	-	32	32
Total	4	10	60	20	10	10	150	75	4	32	36

Self-Study Paper II

1. CAD/CAM Practices in Metal Forming
2. Optimization Techniques
3. Robotics and Sensors
4. Rapid Prototyping
5. Design for Manufacture
6. Theory of Elasticity & Plasticity
7. Design of Dies
8. Integrated Product Design & Development
9. Design for Manufacturing & Assembly
10. Concurrent Engineering