

Program Outcomes (POs)
Program Specific Outcomes (PSO)
Course Outcomes (COs)
&
CO PO-PSO Articulation Matrices



Department of Mechanical Engineering
BRCM
College of Engineering & Technology

Vision

To be a centre of excellence in the field of mechanical engineering where the best of teaching, learning & research synergize and to train the students to have in depth knowledge of the subject in the field of mechanical engineering thereby making them to develop a level of confidence for carrying out R&D activities and placement in multinational & national companies/industries to serve the nation.

Mission

Imparting good sound technical knowledge to the students for fulfilling the upcoming needs of the society in the various fields of Mechanical Engineering and providing them an overall background suitable for making a successful career in industry /research/higher education in India and abroad.

Program Educational Objectives (PEOs)

The program educational objectives of the U.G. programme in Mechanical Engineering are defined by the M.D. University to which this programme is affiliated. The PEOs are:

1. To subject the graduates to a thorough grounding in the key principles and practices of Mechanical Engineering , and enable them to apply their engineering skills and knowledge of fundamental principles to the design and implementation of practical systems consisting of engineering components to meet customer requirements.
2. To enable the graduates to be successfully employed in the engineering profession, and be actively engaged in learning, understanding and applying new ideas and technologies, or be actively pursuing graduate studies in mechanical engineering.
3. To impart science based engineering education to develop professional skills that will prepare the students for immediate employment in mechanical base industries.
4. To develop the design capability among students so that they have the ability to participate in creative, synthetic and integrative activities in the field of mechanical engineering.
5. To develop communication skills and overall personality of the students.
6. To create among the students the curiosity, the desire and ability to keep learning throughout life.
7. To develop among the students the ability to work with others and effectively interacts with the society.

Program Outcomes (PO) as defined by NBA

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.

Program Specific Outcomes (PSO)

At the end of the program, the student

PSO1: Developing attitude to accept global challenges and apply mechanical engineering knowledge for solving problems related to design, production, and interdisciplinary fields.

PSO2: Capability to present the acquired knowledge coherently both in oral and written discourse.

B.Tech. (ME) 3rd Semester

Course Code	Course Name	L-T-P:C
BSC-ME- 201G	Physics II (Optics & Waves)	3-0-0:3

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	Pupil will be able to recall to different types of waves; and wave properties of light.	L1 (Remember)
CO2	Students will be able to understand the different properties of waves. They will also be able to identify the physical concepts of waves and optics.	L2 (Understand)
CO3	Pupil will be able to apply the formulae of optics and waves at appropriate needs.	L3 (Apply)
CO4	Students will be able to analyse and compare the optical systems (interference and diffraction) and also waves.	L4 (Analyse)
CO5	Pupil will also be able to evaluate/solve different numerical problems and derivations of important parameters and assess their results with appropriate justification.	L5 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-			2	-	1	3	3
CO2	3	2	-	-	-	-	-			2	-	1	3	3
CO3	1	3	-	-	-	-	-			2	-	2	2	3
CO4	1	2	-	-	-	-	-			2	-	3	3	2
CO5	1	2	-	-	-	-	-			3	-	2	3	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
BSC-ME- 203G	Mathematics - III	3-1-0:4

CO (Course outcome)		RBT* -Revised Bloom Taxonomy
CO1	Pupil will be able to recall The mathematical tools needed in evaluating statistical data and the essential tool of partial differential equation in a comprehensive manner.	L1 (Remember)
CO2	Students will be able to understand the ideas of probability and random variables and various discrete and continuous probability distributions and their properties.	L2 (Understand)
CO3	Pupil will be able to apply their knowledge to solve field problems in engineering involving PDEs. They can also formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.	L3 (Apply)
CO4	Students will be able to analyse the basic ideas of statistics including measures of central tendency, correlation and regression	L4 (Analyse)
CO5	Pupil will also be able to evaluate/solve the mathematical problems related to partial differentiation, Probability and Statistics.	L5 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	-	-	1	3	3
CO2	3	2	-	-	-	-	-	-	-	-	-	1	3	3
CO3	2	3	-	-	-	-	-	-	-	-	-	1	3	3
CO4	2	3	-	-	-	-	-	-	-	-	-	1	2	3
CO5	2	3	-	-	-	-	-	-	-	-	-	1	3	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
BSC-ME- 205G	Biology	2-1-0:3

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Recall the concepts of Biology.	L1 (Recall)
CO2	To Understand about living organisms, type of cells and microbes. .	L2 (Understand)
CO3	To Apply Bimolecular Applications of biotechnology in Agriculture, Medicine, Environment	L3 (Apply)
CO4	To Analyse of Concept of genetic engineering	L4 (Analyze)
CO5	To Interpret Economic importance of microbes and Concept of genetic code, Central Dogma	L5 (Interpret)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3						2			1		1	3	
CO2	3									2		1	3	
CO3						3	2			1		1		
CO4						3				2		1		
CO5						3	2			1		1		

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
ESC-ME- 207G	Basics of Electronics Engg.	2-0-0:2

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	Students will be able to Recall the concept of semiconductor devices and concept of operational Amplifier.	L1 (Recall)
CO2	Students will be able to understand the construction, principle of operation and performance of p-n junction diode and BJT as well as OP-AMP & Oscillator circuits.	L2 (Understand)
CO3	Student will be able to Apply the concept of forward and reverse biasing mode of p-n junction diode & OP-AMP	L3 (Apply)
CO4	Student will be able to Analyze the performance characteristics of common emitter Amplifiers and operational amplifiers	L4 (Analyze)
CO5	Student will be able to Design full wave and half wave Rectifier and BJT Amplifiers and operational Amplifiers.	L5 (Design)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	-	-	-	-	-	-	-	3	2	3	3
CO2	3	3	1	-	-	-	2	-	3	-	-	-	3	3
CO3	3	3	3	-	-	3	-	-	2	-	-	-	3	3
CO4	3	2	2	3	2	-	-	-	3	-	-	-	3	2
CO5	3	2	3	3	3	2	-	3	1	2	2	2	3	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
ESC-ME- 209G	Engineering Mechanics	3-0-0:3

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Locate the centroid of an area and calculate the moment of inertia of a section	L1 (Remember)
CO2	To Understand the representation of force, moments for drawing free-body diagrams and analyzing friction-based systems in static condition	L2 (Understand)
CO3	To Apply of conservation of momentum & energy principle for particle dynamics and rigid body kinetics	L3 (Apply)
CO4	To Analyse planar and spatial systems for determining the forces in members of trusses, frames and problems related to friction	L4 (Analyse)
CO5	To Evaluate the motion characteristics of a body subjected to a given force system	L5 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2			1							3	2
CO2	3	3	2			1							3	2
CO3	3	3	2			1				3		1	3	2
CO4	3	3	2			1					2	1	3	2
CO5	3	3	2			1							3	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
ESC-ME- 211G	Basics of Mechanical Engineering	2-0-0:2

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Understand the principles and applications of various manufacturing processes.	L2 (Understand)
CO2	To Understand the concept of strain and strain for the strength of materials.	L2 (Understand)
CO3	To Grasp the concepts of power transmission devices.	L2 (Understand)
CO4	To Understand methods of thermodynamics, refrigeration & air conditioning in mechanical system.	L2 (Understand)
CO5	To Understand the construction & working of hydraulic pumps & turbines.	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	-	-	-	-	-	-	-	3	2	3	3
CO2	3	3	1	-	-	-	2	-	3	-	-	-	3	3
CO3	3	3	2	-	-	-	-	-	2	-	-	-	3	3
CO4	3	2	2	-	2	-	-	-	3	-	-	-	3	2
CO5	3	2	2	-	3	-	-	3	1	2	2	2	3	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME- 213G	Thermodynamics	3-1-0:4

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Analyze the work and heat interactions associated with a prescribed process path	L4 (Analyze)
CO2	To Criticize a different operations on steady flow energy equation	L5 (Evaluate)
CO3	Define the fundamentals of the first and second laws of thermodynamics	L 1 (Define)
CO4	To Evaluate entropy changes in a wide range of processes and determine the reversibility or irreversibility of a process from such calculations.	L5 (Evaluate)
CO5	To Understand the problems related to Steam and plot the processes on H-S and T-S diagram.	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2		2									3	3
CO2	3	3		3									3	3
CO3	3	3	3	2									3	3
CO4	3	3	2	3									3	3
CO5	3	2	2	2									3	3

1-Slightly;

2-Moderately;

3-Substantially

B.Tech. (ME) 4th Semester

Course Code	Course Name	L-T-P:C
PCC-ME-202G	Applied Thermodynamics	3-1-0:4

CO (Course outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To Recall of various practical power cycles and heat pump cycles.	L1 (Remember)
CO2	To Analyze energy conversion in thermal devices such as combustors, air coolers, nozzles, diffusers.	L4 (Analyse)
CO3	To Apply the air conditioning processes using principles of Psychrometry.	L3 (Apply)
CO4	To Analyze energy conversion in thermal devices such as steam turbines and reciprocating compressors	L4 (Analyse)
CO5	To Understand phenomena occurring in high speed compressible flows	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	1	1		2	1		1			1	2	3
CO2	2	3	1	1		2	1		1			1	2	3
CO3	2	3	1	1		2	1		1			1	2	3
CO4	2	3	1	1		2	1		1			1	2	3
CO5	2	3	1	1		2	1		1			1	2	3

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME-204G	Fluid Mechanics	3-1-0:4

CO (Course outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	Define fluid and Understand Fluid properties, Buoyancy, stability of submerged and floating bodies, Manometry, and static fluid forces on different surfaces	L1 (Remember)
CO2	Understand various types of flow, Mass Momentum and energy conservation and related equations.	L2 (Understand)
CO3	Understand laminar and turbulent flow through pipes and parallel plates.	L2 (Understand)
CO4	Explain various applications of Bernoulli's Equation, Notches and Weirs, Orifices and Mouthpieces, Major and Minor losses in pipe flow, piping network, and draw HGL and TEL	L2 (Explain)
CO5	Analyze the basic concepts of fluid-statics, kinematics and dynamics with their applications.	L4 (Analyze)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												3	3
CO2	3	2											3	3
CO3	3												3	3
CO4	3												3	3
CO5	3												3	3

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME-206G	Strength of Materials	3-1-0:4

CO (Course outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	Define the concepts of stress & strain and their use in the design of machine members and structures.	L 1 (Define)
CO2	Identify the shear force, bending moment, slope and deflection in different types of beams	L 2 (Identify)
CO3	Execute analytical methods used in connection with the structural design of columns, long mechanical members under compression.	L 3 (Execute)
CO4	Classify the effect of various loading combinations on a mechanical/structural member.	L 2 (Classify)
CO5	Examine structural designs subject to various forces and loads.	L 4 (Examine)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1			2				2					3	3
CO2		3				1							3	3
CO3		2					1						3	3
CO4	2							1					3	3
CO5			2			1				2			3	3

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME -208G	Materials Engineering	3-0-0:3

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Define the structure of materials, APF (Atomic Packing Factor), Co-ordination Number, etc.	L1 (Remember)
CO2	To illustrate the concept of mechanical behavior materials.	L2 (Understand)
CO3	To Construct the TTT as well as the CCT diagram.	L3 (Apply)
CO4	To Distinguish between various heat treatment processes	L4 (Analyse)
CO5	To Discuss the composite formation from various materials	L5 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2	1	2		1					1	2	1
CO2	2	3	2	1	2		1					1	2	1
CO3	2	3	1	1	1		3					1	2	1
CO4	2	3	1	1	2		1					1	2	1
CO5	2	3	2	1	2		3					1	2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME -210G	Instrumentation & Control	3-0-0:3

CO (Course outcome)		RBT* -Revised Bloom Taxonomy
CO1	To Recall basic meters such as voltmeters and ammeters.	L1 (Remember)
CO2	To Explain the performance characteristics of each instrument.	L2 (Understand)
CO3	To Apply the complete knowledge of various electrochemical instruments/transducers to measure the physical quantities in science, engineering, and technology.	L3 (Apply)
CO4	To Analyse the fundamental measurement method of Displacement, Pressure, Strain, etc.	L4 (Analyse)
CO5	To Measure the flow and vacuum pressure by different electrochemical instruments.	L5 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	1	2							1	3	1
CO2	2		2	1	2							1	2	2
CO3	1	3	1	1	1							2	2	1
CO4	2	2	1	1	2							1	3	2
CO5	2	3	2	1	2							1	2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC-ME-212G	Applied Thermodynamics Lab	0-0-2:1

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	To study low pressure boilers, high pressure boilers and their accessories and mountings.	L1 (Remember)
CO2	To prepare heat balance sheet for given boiler.	L4 (Analyse)
CO3	To Applying concept of power output & efficiency of a steam turbine to find result of practical existing problem.	L3 (Apply)
CO4	To find calorific value of a sample of fuel using Bomb calorimeter.	L4 (Analyse)
CO5	To Illustrate the Construction of impulse and reaction steam turbines.	L4 (Analysis)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	1		1	2						2	1
CO2	2	2	1	1		1	2						2	1
CO3	2	2	1	1		1	2						2	1
CO4	2	2	1	1		1	2						2	1
CO5	2	2	1	1		1	2						2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC-ME-214G	SOM Lab	0-0-2:1

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	Identify the Impact strength (Toughness) by different methodology in the mechanical components	L 1 (Identify)
CO2	Compare the Hardness of different types of specimen	L 4 (Compare)
CO3	Develop the compressive strength for a cast iron specimen.	L 6 (Develop)
CO4	Execute the tensile test to obtain ultimate tensile strength and percentage elongation for a mild steel specimen.	L 3 (Execute)
CO5	Differentiate shear modulus and shear modulus in the solid and hollow shaft for power transmission	L 4 (Differentiate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2		3				2					2	1
CO2	1		2			1	2						2	1
CO3		3							1				3	1
CO4				2	2		1						2	1
CO5	1		1			2			1				2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC-ME-216G	Fluid Mechanics Lab	0-0-2:1

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	Understand the basic concept of fluid and properties of fluid.	L 2 (Understand)
CO2	Determine experimentally Metacentric height of the given body; and Cd, Cv & Cc of the given orifice.	L 4 (Identify)
CO3	Calibrate experimentally the given rectangular notch or triangular notch, Venturimeter, Nozzle meter and Orifice meter and determine flow rate.	L 3 (Calibrate)
CO4	Stating Bernoulli's theorem with assumptions verify experimentally Bernoulli's theorem with the help of given experimental setup.	L 3 (Verify)
CO5	Determine and analyze major and minor pipe losses.	L 4 (Identify)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2			1				1	1			1	1
CO2	2	2			1				1	1			1	1
CO3	2	2			1				1	1			1	1
CO4	2	2			1				1	1			1	1
CO5	2	2			1				1	1			1	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC-ME -218G	Materials Lab	0-0-2:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Recall the principles of materials science and engineering through a lab investigation.	L1 (Remember)
CO2	To Understand the basic structure of materials.	L2 (Understand)
CO3	To Develop formal laboratory reports describing the results of experiments.	L3 (Apply)
CO4	To Test for basic instruments in materials science and engineering.	L4 (Analyse)
CO5	To Interpret the data of the basic structure of materials from the experiments.	L5 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	2	1									2	1
CO2	2	2	2	1									2	2
CO3	2	3	1	1	1		2					2	3	1
CO4	1	3	1	1	2		1					2	2	2
CO5	2	1	2	1	2		3					2	2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC-ME -220G	Instrumentation Lab	0-0-2:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Recall the various control devices and parts of measurement systems.	L1 (Remember)
CO2	To Understand about the basics and working principles of pressure, temperature and flow measurement.	L2 (Understand)
CO3	To Identify the different variation of measurement parameter with various input conditions.	L3 (Apply)
CO4	To Analyze the primary, secondary and tertiary measurements.	L4 (Analyse)
CO5	To Explain the applications of measurement systems.	L5 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2	3	3							2	3	1
CO2	2		1		2							1	3	2
CO3	3	2	1	2	1							2	2	1
CO4	2	2	3		2							2	3	2
CO5	2	3	2		1							2	2	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
MC -106G	Environment Science	0-0-2:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Understand the core concepts and methods from ecological and physical sciences and their application in environmental problem-solving.	L2 (Understand)
CO2	To Discuss Living Organisms, and various issues related to Environment.	L2 (Understand)
CO3	To Apply the environment friendly techniques for healthy environment.	L3 (Apply)
CO4	To Analyze problems associated with environmental degradation including pollution related issues.	L4 (Analyse)
CO5	To Assess the contribution of human behaviour in environmental degradation.	L4 (Analyse)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						2	2	2				2	1	1
CO2						3	2	2				2	1	2
CO3						3	2	2				2	1	2
CO4						3	2	2				2	1	2
CO5						3	2	2				2	1	1

1-Slightly;

2-Moderately;

3-Substantially

B.Tech. (ME) 5th Semester

Course Code	Course Name	L-T-P:C
PCC- ME-301G	Computer Aided Design	3-0-0:3

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	To Understand the basics of CAD/CAM, CIM and Computer Aided Quality Control.	L2 (Understand)
CO2	To Construct model of different types of curves, surfaces and solids.	L6 (Create)
CO3	To Understand the concept of group technology, transformation of points and lines in computer aided software.	L2 (Understand)
CO4	To Understand and implement the coding.	L2 (Understand)
CO5	To Apply computer aided process planning.	L3 (Apply)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-									2	3
CO2	3	2	2	2	3								2	3
CO3	3	-	2	-	2								3	3
CO4	3	2	3	4	3								3	3
CO5	3	-	-	-	3								3	3

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC- ME-303G	Solid mechanics	3-1-0:4

CO (Course outcome)		Revised Bloom's Taxonomy
CO1	Define the concepts of stress & strain and their use in the design of machine members and structures.	L1 (Define)
CO2	Identify the shear force, bending moment, slope and deflection in different types of beams	L 2 (Identify)
CO3	Execute analytical methods used in connection with the structural design of columns, long mechanical members under compression.	L3 (Execute)
CO4	Classify the effect of various loading combinations on a mechanical/structural member.	L2 (Classify)
CO5	Examine structural designs subject to various forces and loads.	L4 (Examine)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1		1										2	1
CO2	3	3	2						1				2	2
CO3	3	2	2						1				2	2
CO4	2	3	2						1				2	3
CO5	3	3	2						1				2	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME -305G	Manufacturing Technology-I	3-0-0:3

CO (Course outcome)		RBT* -Revised Bloom Taxonomy
CO1	Explain the single-point tool geometry, concept of orthogonal and oblique cutting and thermal aspects of metal cutting.	L2 (Understand)
CO2	Apply the Merchant thin shear plane model of metal cutting, and Taylor's tool life principles to a given problem.	L3 (Apply)
CO3	Explain the constructional details, working mechanisms and operations performed on the general and special purpose machine tools and calculate the machining time in turning, shaping and milling operations.	L2 (Explain)
CO4	To Analyse the stresses, cutting forces, temperature, power, and specific energy in metal cutting with a single point cutting tool.	L4 (Analyse)
CO5	To Develop interrelations among ASA, ORS and NRS systems of tool geometry.	L6 (Create)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3											1	2	1
CO2	3	3	2	3			2						3	2
CO3	3						2			2		2	3	3
CO4	3	3	2	3							1	1	2	1
CO5	3	2					2						3	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC- ME-307G	Kinematics of Machine	3-0-0:3

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	To Recall the Kinematic Chain, Mechanisms and their Inversions; analyze velocity and acceleration of various mechanisms.	L1 (Remember)
CO2	To Explain and draw cam profile and velocity-acceleration analysis for different cams and followers.	L2 (Understand)
CO3	To Explain power transmitted with Belts and pulleys and also Gears and Gear Trains.	L5 (Evaluate)
CO4	To Analysis of Plane Mechanisms.	L4 (Analyze)
CO5	To Analysis Kinematics synthesis of Mechanisms.	L4 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	2		2	1						2	3
CO2	2	2	3	2		2	1						2	3
CO3	2	2	3	2		2	1						2	3
CO4	2	2	3	2		2	1						2	3
CO5	2	2	3	2		2	1						2	3

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC- ME-309G	Fluid machines	3-0-0:3

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	Define fluid and Understand Fluid properties, Buoyancy, stability of submerged and floating bodies, Manometry, and static fluid forces on different surfaces	L1 (Remember)
CO2	Understand various types of flow, Mass Momentum and energy conservation and related equations.	L2 (Understand)
CO3	Understand laminar and turbulent flow through pipes and parallel plates.	L2 (Understand)
CO4	Explain various applications of Bernoulli's Equation, Notches and Weirs, Orifices and Mouthpieces, Major and Minor losses in pipe flow, piping network, and draw HGL and TEL	L2 (Understand)
CO5	Understand and classify different Turbines and Pumps, plot curves for various efficiencies and draw velocity triangles for the same.	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2		1										1	1
CO2	2	3	2										1	1
CO3	2	3	2										1	1
CO4	2	2	2										1	1
CO5	2	3	2										1	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC- ME-311G	Computer Aided Design & Manufacturing Lab	0-0-2:1

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	Understand and perform about the 2D drawing and modelling.	L2 (Understand)
CO2	Apply 3D software in part designing.	L3 (Apply)
CO3	Create various parts assembly design by using software	L6 (Create)
CO4	Understand about G Codes and M codes.	L2 (Understand)
CO5	Understand and apply NC part programming and OPTIMIZE method.	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3		3	3	2				2	3			2	
CO2	3	2	2	2	2				3	2			2	
CO3	3	2	3	2	2				2	2			2	
CO4	3	2	2	3	2				3	2			2	
CO5	3	2	2	2	2				2	3			2	

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC- ME-313G	Fluid machines Lab	0-0-2:1

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	To study the constructional details of turbines and draw its fluid flow circuit.	L4 (Evaluate)
CO2	To draw the constant head, constant speed and constant efficiency performance characteristics of turbines.	L4 (Evaluate)
CO3	To Understand laminar and turbulent flow through pipes and parallel plates.	L2 (Understand)
CO4	To study the construction details of hydraulic pumps and evaluation of their performance.	L4 (Evaluate)
CO5	To study the model of Hydro power plant and draw its layout.	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2			1							2	1
CO2	2	2	2			1							2	1
CO3	2	3	1			1							2	1
CO4	2	2	1			1							2	1
CO5	2	3	1			1							2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC- ME-315G	Kinematics of Machine Lab	0-0-2:1

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	To Recall the various practical demonstrations of mechanism.	L1 (Remember)
CO2	To Explain and demonstrate cam and followers arrangements available in laboratory and plot displacement v/s angle of rotation curve for these.	L2 (Explain)
CO3	To Differentiate power transmitted with Belts and pulleys and also Gears and Gear Trains.	L4 (Analyze)
CO4	To design some linkage mechanisms and cam systems to generate specified output motion.	L5 (Design)
CO5	To Analysis the slider displacement, velocity and acceleration against crank rotation for single slider crank mechanism.	L4 (Analyze)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2			2							1	1
CO2	2	2	2			2							1	1
CO3	2	2	2			2							1	1
CO4	2	2	2			2							1	1
CO5	2	2	2			2							1	1

1-Slightly;

2-Moderately;

3-Substantially

B.Tech. (ME) 6th Semester

Course Code	Course Name	L-T-P:C
PCC-ME -302G	Manufacturing Technology-II	3-0-0:3

CO (Course outcome)		RBT* -Revised Bloom Taxonomy
CO1	To Select cutting fluids, tool materials, and coatings for improving tool life and machinability.	L4 (Select)
CO2	To Estimate optimum cutting speed concerning production cost and production rate.	L4 (Analyse)
CO3	To Select a modern machining process based on the effect of various process parameters.	L4 (Select))
CO4	To Analyse the stresses, cutting forces, temperature, power, and specific energy in metal cutting with a single point cutting tool.	L4 (Analyse)
CO5	To Develop interrelations among ASA, ORS and NRS systems of tool geometry.	L6 (Create)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3											1	2	1
CO2	3	3	2	3			2						3	2
CO3	3						2			2		2	3	3
CO4	3	3	2	3							1	1	2	1
CO5	3	2					2						3	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME -304G	Design of machine element-I	3-0-0:3

CO (Course outcome)		RBT* -Revised Bloom Taxonomy
CO1	Define the customer's need based on design considerations with the influence of manufacturing processes in the design of machine elements.	L 1 (Define)
CO2	Describe the component behavior subjected to loads and access the failure criteria under fatigue loading	L 2 (Describe)
CO3	Apply the role of stress concentration, failure theories in various mechanical components with importance of mating components.	L 3 (Apply)
CO4	Differentiate the design steps of cotter and knuckle joint, welded and riveted joint with implementation of direct and eccentric loading.	L 4 (Differentiate)
CO5	Explain the detailed design steps of shaft, keys and couplings. Also, the designing of closed coil helical spring under various load.	L 2 (Explain)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1		2			2			1					
CO2			2				2							1
CO3							1							
CO4		1		1		2				2			3	
CO5			1		1			1		3			2	

1-Slightly;

2-Moderately;

3-Substantially

CourseCode	CourseName	L-T-P:C
PCC-ME -306G	Heat Transfer	3-1-0:4

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Remember the basic modes and laws of heat transfer.	L1 (Remember)
CO2	To Understand the laws of thermal radiation and the concept of black body.	L2 (Understand)
CO3	To Apply concept of boundary layer and develop the related equations.	L3 (Apply)
CO4	To analyse general conduction equation in Cartesian, cylindrical and spherical coordinates.	L4 (Analyse)
CO5	To Understand the concept of free and forced convection and discuss the dimensional analysis.	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2	3	3							2	3	1
CO2	2		1		2							1	3	2
CO3	3	2	1	2	1							2	2	1
CO4	2	2	3		2							2	3	2
CO5	2	3	2		1							2	2	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME -308G	Dynamics of Machines	3-0-0:3

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	To Explain the types of Governor and Dynamometer and their application.	L2 (Explain)
CO2	To Understand the Static and Inertia Force Analysis.	L2 (Understand)
CO3	To Differentiate the Balancing of rotating and reciprocating masses.	L4 (Differentiate)
CO4	To Explain the principle and verify the practical vs. theoretical torque relation for gyroscope and its applications.	L2 (Explain)
CO5	Explain the principle and applications of a gyroscope.	L2 (Explain)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2			1							1	2
CO2	3	2	2			1							1	2
CO3	3	2	2			1							1	2
CO4	3	2	2			1							1	2
CO5	3	2	2			1							1	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC-ME -310G	Workshop Lab-I	0-0-3:1.5

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To choose and Practice of orthogonal & oblique cutting on a lathe.	L3 (Choose)
CO2	To interpret tool life while milling a component on the Milling Machine.	L6 (Interpret)
CO3	To Identify the tool wear of a cutting tool while drilling on a drilling machine.	L3 (Apply)
CO4	To estimate machining time calculation and comparison with actual machining time while cylindrical turning on a Lathe and finding out cutting efficiency.	L4 (Calculate)
CO5	To construct a part programming on a NC lathe for outside turning, taper turning, drilling and outside threading.	L5 (Construct)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1											2	1
CO2	3	2	3	2			2						3	
CO3	2						1	2					3	2
CO4	3	1											2	
CO5	3	3	2	3			2	2					2	2

1-Slightly;

2-Moderately;

3-Substantial

Course Code	Course Name	L-T-P:C
LC-ME -312G	Workshop Lab-II	0-0-2:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To study the various types of I.C. Engines and Cycles of operation.	L1 (Remember)
CO2	To Apply the effect of various operating variables on engine performance	L3 (Apply)
CO3	To Demonstration of fuel metering and fuel supply systems for different types of engines	L3 (Apply)
CO4	To Analyze & Justify the suitability of conventional and non-conventional fuels for IC engines	L4 (Analyse)
CO5	To Understand the effects of emission formation of IC engines, its effects	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1											2	1
CO2	3	2	3	2			2							
CO3	2						1	2						2
CO4	3	1												
CO5	3	3	2	3		3	2	2					2	2

1-Slightly;

2-Moderately;

3-Substantial

Course Code	Course Name	L-T-P:C
LC-ME -314G	Heat transfer Lab	0-0-2:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Study the thermal conductivity of metal rod, insulating material and liquids.	L 1 (Remember)
CO2	To Understand the concept of composite wall and determine its thermal resistance.	L 2 (Understand)
CO3	To Analysis the temperature profile in free and forced convection.	L 4 (Analysis)
CO4	To Evaluate the performance of a heat exchanger.	L 5 (Evaluate)
CO5	To Understand the concept of solar heating and measure the performance of solar equipment.	L 2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2					3	3			1	1
CO2	2	2							2	2			1	1
CO3	2	2							2	2			1	1
CO4	3	3							3	3			3	1
CO5	2	2							2	2			2	2

1-Slightly;

2-Moderately;

3-Substantial

Course Code	Course Name	L-T-P:C
LC-ME -316G	Dynamics of machines Lab	0-0-2:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Understand the various practical demonstrations of forces in mechanism.	L2 (Understand)
CO2	To Describe, discuss and differentiate various types of dynamometers with their applications.	L4 (Analysis)
CO3	To perform experiment on Governors to prepare performance characteristic Curves, and to find stability & sensitivity.	L3 (Apply)
CO4	To perform the experiment for balancing on balancing machine.	L3 (Apply)
CO5	To determine gyroscopic couple on Motorized Gyroscope.	L3 (Apply)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1									1	2
CO2	2	2	2	1									1	2
CO3	2	2	2	1									1	2
CO4	2	2	2	1									1	2
CO5	2	2	2	1									1	2

1-Slightly;

2-Moderately;

3-Substantial

B.Tech. (ME) 6th Semester

Course Code	Course Name	L-T-P:C
PEC-ME-401G	Refrigeration & Air Conditioning	3-0-0:3

CO (Course outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To Understand the principles and remember the applications of refrigeration systems.	L2 (Understand)
CO2	To Analyze performance of vapor compression refrigeration system.	L4 (Analyse)
CO3	To Analyze the air conditioning processes using principles of Psychrometry.	L4 (Analyse)
CO4	To Evaluate cooling and heating loads in an air conditioning system.	L5 (Evaluate)
CO5	To Create capacity to compute heating / cooling load.	L6 (Create)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3											1	2
CO2	3	1	3			3	3						1	2
CO3	2	3	2				3						1	2
CO4	2	2	3			3	1						1	2
CO5	2	3				1							1	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME-401G	Design of Machine Element - II	3-0-0:3

CO (Course outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	Apply knowledge of design considerations such as variable loads, endurance stresses, size, surface finish, notch sensitivity, and stress concentration and design Shafts and Bolts under variable stresses.	L3 (Apply)
CO2	Design of spur, helical, bevel and worm gears under wear and dynamic load consideration using Lewis and Buckingham equations. Analyze bearing reactions due to gear tooth forces.	L5 (Design)
CO3	Design of sliding and journal bearings for given hydrodynamic, hydrostatic, boundary, thermal equilibrium conditions and minimum film thickness of lubrication.	L5 (Design)
CO4	Select anti-friction bearings for different loads and load cycles, mounting of the bearings, Method of lubrication.	L5 (Evaluate)
CO5	Selection and design of various types of springs for given application.	L5 (Evaluate)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3											1	2
CO2	3	1	3			3	3						2	2
CO3	2	3	2				3						2	2
CO4	2	2	3			3	1						2	2
CO5	2	3				1							2	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PCC-ME-403G	Entrepreneurship Development	3-0-0:3

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	To Define insights into the management, opportunity search, identification of a product, market flexibility studies, project finalization etc. required for small business enterprise.	L1 (Define)
CO2	To Understand who the entrepreneurs are and what competences needed.	L2 (Understand)
CO3	To Prepare the report and do oral presentation on the topics such as product identification, business ideas, export marketing etc.	L4 (Develop)
CO4	To Think creative and innovative.	L5 (Evaluate)
CO5	To Apply the different financial and other assistance available for establishing small industrial units.	L3 (Apply)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2					2	2	3	1	3	2	3	
CO2		2					2	2	3	1	3	2	3	
CO3		2					2	2	3	1	3	2	3	
CO4		2					2	2	3	1	3	2	3	
CO5		2					2	2	3	1	3	2	3	

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PEC-ME-411G	Solar Energy Engineering	3-0-0:3

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Enumerate strategic and policy recommendations on usage of solar power	L1 (Remember)
CO2	To get Knowledge of the technology, economics and regulation-related issues associated with solar power development and management	L2 (Understand)
CO3	To illustrate the applications of solar system and the associated with energy conversion issues	L3 (Apply)
CO4	To Analyze the viability of solar power projects	L4 (Analyse)
CO5	To Create awareness about sources of energy and able to estimate how long the available conventional fuel reserves will last.	L6 (Create)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3		3		1					2	2
CO2	3	3	3	2	2		1						3	1
CO3	3	2	2	1		2				2		2	2	2
CO4	3	3	1	2			1				2	1	3	2
CO5	3	1	1	3	1	1	1						2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC-ME-403G	Workshop - III	0-0-2:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	Understand about the basics and working principle of water cooler.	L2 (Understand)
CO2	Understand about the basics and working principle of cooling tower	L2 (Understand)
CO3	Identify the different cycle of operation in air-conditioning	L3 (Identify)
CO4	Analyze the humidity measurement and its importance in air-conditioning	L4 (Analyse)
CO5	Learn about the various control devices and parts of refrigeration and air-conditioning systems	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3								2	3				
CO2	3								2	3				
CO3	3	3		2					2	3				
CO4	3	3	2	3					2	3				
CO5	3								2	3				

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PROJ-ME-407G	Project - I	0-0-9:9

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Define the problem identification, requirements and analyze the feasibility.	L2 (Understand)
CO2	To Demonstrate knowledge, skills of professional engineer and applying hypothesis on Problem.	L3 (Apply)
CO3	To Design and develop the solution for real-life engineering problems.	L6 (Create)
CO4	To Evaluate the developed system to solve real world problems.	L5 (Evaluate)
CO5	Ability to use formal & informal communication with team members and guide.	L5 (Apply)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1						2	2	3	1	3	3
CO2	2	3	2	2					2	2		1	2	3
CO3	2	2	3	2					2	2	2	1	3	2
CO4	2	2	2	3					2	2	2	1	2	3
CO5	2	2	2						3	3		1	2	3

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
MC-317G	Constitution of India	2-0-0:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Understand the basic features of Constitution of India	L2 (Understand)
CO2	To Understand about salient features of the Constitution of India.	L2 (Understand)
CO3	To Understand fundamental duties and federal structure of Constitution of India	L2 (Understand)
CO4	To Understand about emergency provisions in Constitution of India	L2 (Understand)
CO5	To Understand about fundamental rights under Constitution of India	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						3	2					1	0	1
CO2						3	2					1	0	1
CO3						2	3					1	0	1
CO4						3	2					1	1	1
CO5						3	2					1	1	1

1-Slightly;

2-Moderately;

3-Substantially

B.Tech. (ME) 8th Semester

Course Code	Course Name	L-T-P:C
PPC-ME-402G	Industrial Automation	3-0-0:3

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	Understanding the concept of Automation in production system.	L2 (Understand)
CO2	Explain the different material handling system used in industry.	L2 (Explain)
CO3	Understand the concept of control technologies used in automation.	L2 (Understand)
CO4	Understand the concept of pneumatics and hydraulic components and their circuits.	L2 (Understand)
CO5	Apply the fundamentals of part programming and Advance part programming of CNC in automated production system.	L4 (Apply)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2		3		2			1					1	1
CO2			1				3						2	1
CO3	2		2			2							1	1
CO4	1			1			1						1	1
CO5		2	1			2							2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PEC-ME-420G	Automobile Engineering	2-0-0:1

CO (Course outcome)		RBT*- Revised Bloom's Taxonomy
CO1	To Describe and compare the construction, working, feature, relative merits and application of different types of chassis, bodies, frames, clutches and brakes of automobile and use suitable diagram to support their description.	L1 (Remember)
CO2	To Explain construction, working and features of different elements of power transmission in automobile namely gear boxes, fluid coupling, hydraulic torque convertor, overdrive, front and rear wheel drive, propeller shaft, differential, power transmission through rear and front axle and automatic transmission system.	L2 (Understand)
CO3	To Describe how the steering and the suspension systems operate.	L2 (Understand)
CO4	To Explain the environmental implications of automobile emissions.	L5 (Evaluate)
CO5	Understand the function of each automobile component and also have a clear idea about the overall vehicle performance.	L4 (Apply)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1		2							2	1
CO2	2	2	2	1		2							2	1
CO3	2	2	2	1		2							2	1
CO4	2	2	2	1		2							2	1
CO5	2	2	2	1		2							2	1

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PEC-ME-412G	Power Plant Engineering	3-0-0:3

CO (Course outcome)		RBT* -Revised Bloom Taxonomy
CO1	To Know about the different energy sources and power generation.	L1 (Remember)
CO2	To Ability to Analyze steam cycle and learn about different handling systems used in steam power generators.	L4 (Analyse)
CO3	To Understand the concept of hydrology and details about the hydroelectric power plant.	L2 (Understand)
CO4	To Evaluate Learn about combined cycles for power generation and diesel engine power plants.	L5 (Evaluate)
CO5	To Understand the conceptual knowledge of nuclear energy, its resources and the economics of power generation	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3													2
CO2	2			2			3						1	2
CO3	1	2					3						1	2
CO4	2												1	2
CO5	2	1		3									1	2

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
LC-ME-406G	Workshop Lab - IV	0-0-2:1

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	Understand construction details and working of various parts of automotive system	L2 (Understand)
CO2	Understand constructional details and working of Cylinder, Ignition System and Injection System of I C Engine.	L2 (Understand)
CO3	Summarize constructional details of Automotive Clutches, Automotive Transmission Systems Automotive Drive Lines & Differentials.	L2 (Understand)
CO4	Understand about design and constructional details of Automotive Suspension Systems and Automotive Suspension Systems.	L2 (Understand)
CO5	Understand about design and constructional details Automotive Tyres & wheels Automotive Brake Systems Automotive Emission / Pollution control systems.	L2 (Understand)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3								2	3			1	2
CO2	3	3							3	3			1	2
CO3	3	2							2	2			1	2
CO4	3	3	3	3					3	3			1	3
CO5	3	3	3	2					3	3			1	3

1-Slightly;

2-Moderately;

3-Substantially

Course Code	Course Name	L-T-P:C
PROJ-ME-408G	Project - I	0-0-10:10

CO (Course outcome)		RBT*-Revised Bloom Taxonomy
CO1	To Define the problem identification, requirements and analyze the feasibility.	L2 (Understand)
CO2	To Demonstrate knowledge, skills of professional engineer and applying hypothesis on Problem.	L3 (Apply)
CO3	To Design and develop the solution for real-life engineering problems.	L6 (Create)
CO4	To Evaluate the developed system to solve real world problems.	L5 (Evaluate)
CO5	Ability to use formal & informal communication with team members and guide.	L5 (Apply)

Course Articulation Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1						2	2	3	1	3	3
CO2	2	3	2	2					2	2		1	2	3
CO3	2	2	3	2					2	2	2	1	3	2
CO4	2	2	2	3					2	2	2	1	2	3
CO5	2	2	2						3	3		1	2	3

1-Slightly;

2-Moderately;

3-Substantially