

Sr. No.	Department of Mechanical Engineering	
<b>Third Semester</b>		
1	BEME301T	Applied Mathematics – III
2	BEME302T	Kinematics of Machines
3	BEME303T	Fluid Mechanics
4	BEME304T	Manufacturing Processes
5	BEME305T	Engineering Metallurgy
6	BEME306P	Machine Drawing
<b>Fourth Semester</b>		
1	BEME401T	Applied Mathematics
2	BEME402T	Engineering Thermodynamics
3	BEME403T	Hydraulic Machines
4	BEME404T	Machining Processes
5	BEME405T	Mechanics of Materials
<b>Fifth Semester</b>		
1	BEME501T	Industrial Economics & Entrepreneurship Development
2	BEME502T	Design of Machine Elements
3	BEME503T	Advanced Production Processes
4	BEME504T	Heat Transfer
5	BEMT505T	Mechanical Measurement and Metrology
<b>Sixth Semester</b>		
1	BEME601T	Energy Conversion -I
2	BEMT602T	Control System Engineering
3	BEME603T	Operations Research
4	BEME604T	Mechatronics
5	BEME605T	Dynamics of Machines
6	BEME606T	Functional English
<b>Seventh Semester</b>		
1	BEME701T	Industrial Engineering
2	BEME702T	Automobile Engineering
3	BEME702T	Power plant engineering
4	BEME703T	Computer Aided Design
5	BEME704T	Energy Conversion - II
6	BEME705T	Design of Mechanical Drives
<b>Eighth Semester</b>		
1	BEME801T	Industrial Management
2	BEME802T2	Computer Integrated Manufacturing (Elective II)
3	BEME802T	Refrigeration and Air Conditioning (Elective – II)
4	BEME803T5	Advance Internal Combustion (IC) Engine (Elective III)
5	BEME803T	Advanced Manufacturing Techniques (Elective III)
6	BEME803T3	Renewable Energy Systems (Elective III)
7	BEME804T	Automation in Production
8	BEME805T	Energy Conversion – III

## Department of Mechanical Engineering

The department of Mechanical Engineering has framed the following Program Specific Outcomes in consultation with concerned stakeholder and corresponding committees.

PSO1	Graduates will be able to apply technical skills and modern engineering tools to
PSO2	Graduates will be capable of developing Research Skills in utilization of

<b>BE Mechanical Engineering Third Semester</b>	
	<b>Applied Mathematics – III (BEME301T)</b>
CO301.1	Understand Laplace Transform and should able to solve differential equations,
CO301.2	Expand the function in periodic form using Fourier series and understand the
CO301.3	Will be able to formulate variation problems and analyze them to deduce key
CO301.4	Understand the fundamental concepts of complex analysis and also be able to
CO301.5	Formulate and solve linear partial differential equations problems and basic
CO301.6	Will be able to simplify the power of matrices, system of linear equations ,
	<b>Kinematics of Machines (BEME302T)</b>
CO302.1	The students will able to understand the basics of mechanism and its
CO302.2	The students will able to understand determination of velocity and acceleration of
CO302.3	The students will able to understand the basic concept of cam and followers and it applications. Also displacement, velocity and acceleration for various types
CO302.4	The students will able to understand different types of gears and its applications.
CO302.5	The students will able to understand the Synthesis of Mechanism by graphical
CO302.6	The students will able to understand friction theory, various types of clutch, brake
	<b>Fluid Mechanics (BEME303T)</b>
CO303.1	Student will familiar with different fluid properties and its measurement,
CO303.2	Student will develop an understanding of the behavior of fluid at rest or in
CO303.3	Students will ability to apply the Bernoulli's equation to solve practical

CO303.4	Student will be able to carry out functional relationship of parameters and
CO303.5	Students will be able to analyses the flow through the pipeline, power
CO303.6	Students acquire knowledge of laminar and turbulent layer fundamentals and analyze drag and lift forces on immersed
	<b>Manufacturing Processes (BEME304T)</b>
CO304.1	Student should able to understand practical applications of Pattern making, Core
CO304.2	Student should able to understand Gating system and Foundry mechanizing of
CO304.3	Student should able to understand various types of advanced joining processes
CO304.4	Student should able to understand forming processes metals and determination of forging forces and tresses.
CO304.5	Student should able to understand various types of sheet metal operations and
CO304.6	Student should able to understand various types of advanced plastic processes
	<b>Engineering Metallurgy (BEME305T)</b>
CO305.1	Student will be able to understand the fundamentals of various engineering materials, their crystal structure and describe the imperfections, mechanical properties and plastic
CO305.2	Student will be able to acquire the knowledge of solidification mechanism and explain the equilibrium diagram and interpret this knowledge to illustrate the Iron-Iron carbide
CO305.3	Student will be able to obtain basic information of common heat treatment process performed on steel and relate its influence on properties of Steel by which design and
CO305.4	Student will be able to differentiate between carbon steel alloy steels and their and use for the various applications, in light of microstructure.
CO305.5	Student will be able to describe the different type's cast iron and non ferrous alloys, their microstructures, properties and applications.
CO305.6	Student will be able to understand different types of non-destructive tests employed to detect the flaws in materials and explain the powder metallurgy mechanism and its
	<b>Machine Drawing (BEME306P)</b>
CO306.1	Students will be able to understand the concepts of machine drawing and its
CO306.2	Students will be able to draw the orthographic projection and sectional view of
CO306.3	Students will be able to understand the constructions of various fasteners and also
CO306.4	Student will be able to understand the principles and standard technique for
CO306.5	Student will be able to understand the machining processes for machine

<b>BE Mechanical Engineering Fourth Semester</b>	
	<b>Applied Mathematics (BEME401T)</b>
CO401.1	Grasp the concept of numerical methods and apply them to solve various types of equations such as algebraic and transcendental equations and simultaneous
CO401.2	Solve linear and non-linear differential equations and Eigen value problems using
CO401.3	Apply concept of Z- transform for solving difference equations analyze discrete
CO401.4	Find Series solution of Ordinary Differential Equations by Frobenius method and
CO401.5	Know discrete and continuous random variables and their probability
CO401.6	Know about standard probability distribution and random processes.
	<b>Engineering Thermodynamics (BEME402T)</b>
CO402.1	Students will be able to understand the basic concepts of thermodynamics such as
CO402.2	Students will be able to apply the first law of thermodynamics on closed and
CO402.3	Students will be able to apply second law of thermodynamics and entropy concepts in analyzing the performance of heat engines, refrigerators and
CO402.4	Students will be able to analyze the thermodynamic properties of pure substances, formulate heat and work expressions for various thermodynamic processes,
CO402.5	Students will be able to understand different components of steam thermal power
CO402.6	Students will be able to understand and analyze various thermodynamics air
	<b>Hydraulic Machines (BEME403T)</b>
CO403.1	Student will understand practical applications of fluid, impulse momentum
CO403.2	Student will be able to understand classification, basic principle, working,
CO403.3	Student will be able to understand classification, basic principle, working,
CO403.4	Student will be able to understand classification, working, selection and analysis
CO403.5	Student will be able to understand other positive displacement pump and rotary
CO403.6	Student will be able to understand model testing of hydraulic machineries for
	<b>Machining Processes (BEME404T)</b>
CO404.1	Students will understand basic parameters of machining, cutting tools and tool

	of metal cutting.
CO404.2	Students will understand the working principle, construction, specifications and types of lathe machine. Students will performed various operations on
CO404.3	Students will explore to various surface planning processes including shaping, planning and slotting. Also they will understand constructional and
CO404.4	Students will learn and operate milling machines and its types. Also students will
CO404.5	Students will learn about various surface finishing and super finishing processes such as grinding. Classification of grinder and its types and manufacturing
CO404.6	Students will understand drilling process and types of drilling machines. Also
	<b>Mechanics of Materials (BEME405T)</b>
CO405.1	Understand basic concepts of stress, strain and their relations based on linear
CO405.2	Learn analytical and graphical analysis of compound stresses and analysis of
CO405.3	Develop shear-moment diagrams of a beam, and analyze bending stresses, shear
CO405.4	Analyze torsional shear stresses and deformation of circular bars.
CO405.5	Understand stability and buckling phenomena for a slender member under an
CO405.6	Analyze stresses by using various theories of Failure
<b>BE Mechanical Engineering Fifth Semester</b>	
	<b>Industrial Economics and Entrepreneurship Development (BEME501T)</b>
CO501.1	Students will be able to understand Economics and its relation with Capitalism and Socialism, business integration and understanding difference
CO501.2	Students will be able to understand Demand Analysis and Law of return and Marginality, Customer satisfaction and Elasticity of Demand along with
CO501.3	Students will be able to understand factors of Production and their theories. Various associated costs. Stock exchange roles and Functions, Taxation, types
CO501.4	Students will be able to analyze the feasibility of new venture business concept. Evaluate his or her entrepreneur tendency and ability. Brainstorming Ideas
CO501.5	Students will be able to use a variety of feasibility tests, assess and select prospective new ventures and concepts for further study. Conduct focus groups, surveys and other methods for researching customer reactions for various new venture concepts.
CO501.6	Students will be able to conduct a variety of secondary research activities to analyze competition, market trends, industry structures and other issues relevant to specific new venture concepts. Examine and analyze issues

	trade name related)
	<b>Design of Machine Elements (BEME502T)</b>
CO502.1	Students will be able to understand introduction to machine design, design methods, design procedure, various design considerations, modes of
CO502.2	Students will be able understand and design - welded and bolted joints, pressure
CO502.3	Students will be able to understand introduction, types and design of helical and
CO502.4	Students will be able to understand introduction, terminology, applications and design of power screw; introduction, types, theories and design of clutch
	<b>Advanced Production Processes (BEME503T)</b>
CO503.1	Student should able to understand Non-Conventional Machining processes and
CO503.2	Student should able to understand various types of advanced joining processes
CO503.3	Student should able to understand various types of advanced machining processes and also micro-machining, Nano fabrication and High Energy Rate
CO503.4	Student should able to understand various types of sheet metal operations.
CO503.5	Student should able to understand various types of Jigs, Fixtures, Bushes and
CO503.6	Student should able to understand various types of super finishing processes and
	<b>Heat Transfer (BEME504T)</b>
CO504.1	Students will be able to understand and learn the concept of conduction heat transfer without uniform heat generation. Students will be able to analyze
CO504.2	Students will be able to understand and learn the concept of conduction heat transfer with uniform heat generation, Fin and Transient Heat transfer. Students will be able to analyze the conduction heat transfer with uniform heat generation for geometries like plane wall, cylinder and sphere, also they will analyze the
CO504.3	Students will be able to understand and learn the concept of Boundary layer thickness and forced convection. Students will be able to analyze the
CO504.4	Students will be able to understand and learn the concept natural convection dimensional analysis. Students will be able to analyze the natural convection
CO504.5	Students will be able to understand and learn the concept of radiation heat transfer, radiation laws and analyze the radiation heat transfer with and
CO504.6	Students will be able to understand and learn the concept of Heat exchangers and

	<b>Mechanical Measurement and Metrology (BEMT505T)</b>
CO505.1	The course is designed to study various measurement systems and their significance along with the characteristics and order of the instruments.
CO505.2	Students will understand the functionality of various measuring instruments for measuring different physical parameters such as displacement, strain, speed,
CO505.3	Through the course students will gain understanding on different standards of measurement along with their allowances and tolerances. Moreover they
CO505.4	The course is oriented for understanding the working methodology of limits and
CO505.5	Study of different comparators such as mechanical. Electrical, optical etc., for inspection along with optical profile projection is a part of curriculum.
<b>BE Mechanical Engineering Sixth Semester</b>	
	<b>Energy Conversion -I (BEME601T)</b>
CO601.1	The students will be able to understand and learn the concept of Power plant.
CO601.2	The students will be able to understand and learn the concept of Draught. Students will be able to analyze and design the chimney. Students can able
CO601.3	The students will be able to understand and learn the concept of fluidization and
CO601.4	The students will be able to understand and learn the concept steam nozzle. Students will be able to analyze various steam nozzles. Students will be able
CO601.5	The students will be able to understand and learn the concept steam turbines, their
CO601.6	The students will be able to understand and learn the concept of steam condensers
	<b>Control System Engineering (BEMT602T)</b>
CO602.1	The course is designed to understand different control systems along with their types. In this systems, students will analyses and study various actuators
CO602.2	The course is formulated to familiarize students with modeling of different type of systems, including mechanical, electrical, electromechanical etc. and
CO602.3	Through the course students will orient him with concepts related to the
CO602.4	The course is objected towards the understanding of various control systems and its stability analysis using analytical and graphical technique. The understanding of concept related to time domain and frequency domain is
CO602.5	Students will study responses for different types of signals and would cumulate

CO602.6	At the end of the course student will gain up-to date knowledge in control system field through the study of industrial automatic controls and there
	<b>Operations Research (BEME603T)</b>
CO603.1	To provide a formal quantity approach to problem solving by using mathematical model to solve linear programming such as linear programming problem formulation, graphical and simplex method, principle of duality that are used
CO603.2	The students will have the knowledge of mathematical model techniques in
CO603.3	The students will have the knowledge of mathematical model techniques in game
CO603.4	The students will able to understand the concept of network model and use quantitative approach in project management such as CPM and PERT
CO603.5	The students will use mathematical model in Replacement model such as replacement of items that deteriorate with time, items fail suddenly,
CO603.6	The students will use mathematical model such as Queuing theory. Simulation
	<b>Mechatronics (BEME604T)</b>
CO604.1	The course is designed to study basic elements of general mechatronics system. Students would understand the working of mechatronics system and acquire
CO604.2	The students will understand different DAQ Systems, which are the key elements of any control system. In addition they will study the interfacing of
CO604.3	Through the course students will gain understanding on different actuating systems including the study of different actuators such as mechanical,
CO604.4	They will understand different logic elements and with this understanding, they
CO604.5	Students will get up-to date knowledge on PLC and SCADA systems, which are heart of any industrial automation. Through the course module they would
CO604.6	Conceptual knowledge of MEMS and related systems are also studied, which are the future of mechatronics systems, where systems are smaller and with
	<b>Dynamics of Machines (BEME605T)</b>
CO605.1	The students should be able to understand the concept of machine element dynamics and its application for simple two degree of freedom system,
CO605.2	The students should be able to understand dynamic force analysis of four bar
CO605.3	The students should be able to understand static and dynamic balancing in
CO605.4	The students should be able to understand turning moment Vs. crank



	diagram for various engines, flywheels, governors and various types of
CO605.5	The students should be able to understand vibratory systems and their analysis in
CO605.6	The students should be able to understand vibratory system analysis in two
	<b>Functional English (BEIT606T)</b>
CO606.1	The students will become adept in using functional grammar.
CO606.2	The students would be able to write at workplaces.
CO606.3	The students will be able to draft technical reports and write proposals.
CO606.4	The students will be able to understand the planning and procedure of carrying
CO606.5	The students will become well prepared to face competitive examinations and job
CO606.6	The students will become dexterous in presentation skills.
<b>BE Mechanical Engineering Seventh Semester</b>	
	<b>Industrial Engineering (BEME701T)</b>
CO701.1	Define and recognize the concept of Productivity, Work study and Method
CO701.2	Various techniques of work measurement and calculate the standard time
CO701.3	Human factor in engineering in the context of man machine system.
CO701.4	Types of plant layouts and know the principles of material handling.
CO701.5	The concept of value engineering and be aware of other productivity
CO701.6	Various types of maintenance and the concept of reliability and maintainability.
	<b>Automobile Engineering (BEME702T)</b>
CO702.1	Student will be able to understand concept of Automobile Engineering and IC
CO702.2	Student will be able to understand concept of clutches and requirement and
CO702.3	Student will be able to understand concept of how transmission works and how it
CO702.4	Student will be able to understand concept of and need of steering and suspension
CO702.5	Student will be able to understand electrical system in automobile.
CO702.6	Student will be able to understand concept of advances in automobile purpose.
	<b>Power Plant Engineering (BEME702T)</b>
CO702.1	Students will be able to understand the Indian energy scenario and economics of
CO702.2	Students will be able to understand thermal power plant operations, analyze steam cycle and will have ability to understand combined power generation
CO702.3	Students will be able to understand basic combustion reactions, combustion equipment used in thermal power plant, component of steam generator,
CO702.4	Students will be able to understand electricity production from hydro

	plant, component of hydro power plant, types, site selection and advantages of
CO702.5	Students will be able to understand binding energy, fission reactions, components
CO702.6	Able to describe basic principle of gas turbine and diesel engine power plant and provides basic knowledge of non conventional power plant like solar,
	<b>Computer Aided Design (BEME703T)</b>
CO703.1	Students will be able to understand to develop a framework where the designers works with the computer to develop an engineering system and use of
CO703.2	Students will be able to understand concept of computer graphics, windowing,
CO703.3	Students will be able to understand and create 2D,3D,assembly modeling with the help of computer aided design software, student have knowledge of graphics standards, various types of geometric modeling and curves used in CAD
CO703.4	Students will be able to understand and analyze the one dimensional finite element analysis and properties of stiffness matrix, assembly global
CO703.5	Students will be able to understand and analyze the two dimensional finite
CO703.6	Students will be able to understand and analyze optimization in design by using Johnson's method of optimum design for simple machine elements like bar,
	<b>Energy Conversion - II (BEME704T)</b>
CO704.1	Students will be able to understand the working principle of single and multistage reciprocating compressor, minimum work required to drive multistage compressor, applications and analyze the performance of reciprocating
CO704.2	Students will be able to understand the working principle of blowers, rotary
CO704.3	Students will be able to understand working principle of SI, CI, 2-S and 4-S Internal Combustion Engines, Combustion phenomenon, parameters
CO704.4	Students will be able to calculate the performance parameters, preparation of heat balance sheet and interpret the performance curves of Internal
CO704.5	Students will be able to analyze vapor compression refrigeration system, understand the working of VARS, air refrigeration systems,
CO704.6	Students will be able to find the psychrometric properties of air, analyze the
	<b>Design of Mechanical Drives (BEME705T)</b>
CO705.1	Students will be able to understand Types of shaft coupling, Design of rigid coupling (Protective type), Bush pin type Flexible coupling, Flywheel rim

CO705.2	Students will be able to design Flat belt, V-belt, wire ropes, and chain drives for
CO705.3	Students will be able to design Spur, helical and bevel gears for industrial
CO705.4	Students will be able to design worm and worm wheel and I.C. Engine parts like
<b>BE Mechanical Engineering Eighth Semester</b>	
<b>Industrial Management (BEME801T)</b>	
CO801.1	Students will get knowledge about evolution of management thoughts and the
CO801.2	Students will understand the functions of personnel management and the related
CO801.3	Students will know the different types of production system and the concept of
CO801.4	Students will get knowledge about entrepreneurship, traits and competencies for
CO801.5	Students will get knowledge about the steps involved in setting up a business.
CO801.6	Students will get overview of the marketing function and the various sources of
<b>Computer Integrated Manufacturing (BEME802T2) (Elective II)</b>	
CO802.1	Students will acquaint with data bases related to CIM. Its evolution and basic
CO802.2	Students will understand Computer Aided Manufacturing (CAM). The basic
CO802.3	Students will explore and trained to understand part families and generating part codes. They will also understand concept of cellular manufacturing and
CO802.4	Students will understand the concept of Flexible Manufacturing System, Its basic components and need. Further explore to basic components of FMS and types
CO802.5	Students will understand the algorithm and relevance of Computer Aided Process Planning (CAPP). They will also understand the details of
CO802.6	Students will understand Manufacturing System Control, Computerized statistical process control, including Shop Floor Control. Further they will understand
<b>Refrigeration and Air Conditioning (BEME802T) (Elective – II)</b>	
CO802.1	Illustrate the basic concepts of vapor compression and vapor absorption refrigeration systems. Analyze the performance of vapor
CO802.2	Understand the components, controls and defrosting methods of vapor compression refrigeration system. Analyze the performance of
CO802.3	Understand air refrigeration system and can perform the analysis. Understand the
CO802.4	Understand the concept of cryogenics and its applications. Methods

	liquefaction of air and its analysis.
CO802.5	Find the psychrometric properties of air; analyze the psychrometric processes and its application to condition the air. Understand the heat load calculations of an
CO802.6	Understand the principle of air transmission and distribution. Different components used for distribution of conditioned air. Understand the analysis
	<b>Advance Internal Combustion (IC) Engine (BEME803T5) (Elective III)</b>
CO803.1	Students will be able to differentiate between among different IC engine and will demonstrate the ability to perform a thermodynamic analysis of Otto, Diesel
CO803.2	Students will be able to understand the basic components of IC engine and role of lubrication and cooling in reducing friction and wear. Students will be able to understand the characteristics of different fuels. Students will be able
CO803.3	Students will be able to understand combustion phenomenon and combustion chambers in SI engine. Students will be able to understand ignition systems
CO803.4	Students will be able to understand combustion and combustion chambers design
CO803.5	Students will be able to understand the generation of undesirable exhaust
CO803.6	Students will demonstrate the ability to analyze engine performance through
	<b>Advanced Manufacturing Techniques (BEME803T) (Elective-III)</b>
CO803.1	In this unit is designed to provide students with an overview of a wide variety of
CO803.2	Student will learn principles operations capability process parameters economics and applications of various mechanical machining processes and
CO803.3	In this unit student will learn principles, operation, capabilities, process parameter, economics and applications of electrochemical machining and
CO803.4	In this unit student will learn various unconventional welding techniques, control
CO803.5	In this unit is designed to understand the solid phase welding techniques such as ultrasonic friction welding with recent developments and economics
CO803.6	In this unit student will understand the advanced casting processes such as metal casting continuous squeeze / Centrifugal and ceramic shell casting on completion of this unit student Shall understand the importance of advance advanced casting process for unconventional foreign conventional machining
	<b>Renewable Energy Systems (BEME803T3) (Elective III)</b>
CO803.1	Students will be able to understand spectral distribution of solar radiation, solar
CO803.2	Students will be able to understand solar flat plate collector and its

CO803.3	Students will be able to understand concentrating collector and application of
CO803.4	Students will be able to understand biomass, biogas, its generation and
CO803.5	Students will be able to understand wind energy, ocean energy, tidal energy its
CO803.6	Students will be able to understand geothermal energy, magneto hydrodynamic
	<b>Automation in Production (BEME804T)</b>
CO804.1	Students will be able to understand arguments for and against automation, Types of production, Automation principles and strategies. Workpart transfer mechanisms, buffer storage, and analysis of flow line: general terminology and analysis of transfer line without storage and with buffer storage. Line
CO804.2	Types of NC system, Machine control unit, tape and tape readers. DNC, CNC, Adaptive control and their applications. APT (computer assisted
CO804.3	Robot anatomy, work volume, joint notation system, robot control system. Characteristics of robot, robot programming, End effectors. Accuracy, repeatability of robot and Robot applications, work cell layout use of robots in material handling, processing, assembly and inspection.
CO804.4	Automated material handling and storage-conveyor system Types of conveyors, Automated guided vehicle system, vehicle guidance technology, Analysis
CO804.5	Automated Inspection, sensor technology, radio frequency identification, Coordinate measuring machine, machine vision, image acquisition, digitization, image
CO804.6	Computer aided manufacturing, Flexible manufacturing system, Computer aided process planning (CAPP) and their types e.g. Retrieval and generative. Basics
	<b>Energy Conversion – III (BEME805T)</b>
CO805.1	Students will be able to understand the basics, components, working principle,
CO805.2	Students will be able to understand the basics and analysis of jet propulsion
CO805.3	Students will be able to understand the importance of renewable energy sources,
CO805.4	Students will be able to understand the role of energy conservation and its management in an industry; methods, procedure and instruments to conduct
CO805.5	Students will be able to understand basic structure, working principle, various
CO805.6	Students will be able to understand basic structure, working principle,