COURSE OUTCOMES (COs)

DEPARTMENT OF MECHANICAL ENGINEERING

2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the

Programmes offered by the institution.

DEPARTMENT OF MECHANICAL ENGINEERING

VISION

- To be a universal knowledge center in mechanical engineering education, entrepreneurship and industry outreach services.
- To develop competent Mechanical Engineers who use their talent to take up challenges of the industry.

MISSION

- To provide quality education to students in Mechanical Engineering, with sufficient scope to meet emerging challenges of the society.
- To prepare students for successful engineering career by inculcating leadership qualities to encourage entrepreneurship, professional and ethical responsibilities for betterment of society.
- To make the department a "Centre of Excellence" in the field of Mechanical Engineering with highly developed educational infrastructure and active association with the relevant industries.

PROGRAM SPECIFIC OUTCOMES (PSOs):

1. Ability to use various techniques in computer aided design, manufacturing and robotics to obtain the solution for complex problems in automation.
2. Ability to demonstrate the impact of Lean Manufacturing principles, the tools and need for quality in manufacturing.
3. Ability to innovate knowledge in thermal and sustainable energy applications with creativity and skills.

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PROGRAMME EDUCATIONAL OBJECTIVES:

Bachelor of Mechanical Engineering curriculum is designed to impart Knowledge, Skill and Attitude on the graduates to

1. Have a successful career in Mechanical Engineering and allied industries.
2. Have expertise in the areas of Design, Thermal, Materials and Manufacturing.
3. Contribute towards technological development through academic research and industrial practices.
4. Practice their profession with good communication, leadership, ethics and social responsibility.
5. Graduates will adapt to evolving technologies through life-long learning.

PROGRAMME OUTCOMES:

1. An ability to apply knowledge of mathematics and engineering sciences to develop mathematical models for industrial problems.
2. An ability to identify, formulates, and solve complex engineering problems. With high degree of competence.
3. An ability to design and conduct experiments, as well as to analyze and interpret data obtained through those experiments.
4. An ability to design mechanical systems, component, or a process to meet desired needs within the realistic constraints such as environmental, social, political and economic sustainability.
5. An ability to use modern tools, software and equipment to analyze multidisciplinary problems.
6. An ability to demonstrate on professional and ethical responsibilities.
7. An ability to communicate, write reports and express research findings in a scientific community.
8. An ability to adapt quickly to the global changes and contemporary practices.

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9. An ability to engage in life-long learning.

PO 1: Engineering knowledge Apply knowledge of mathematics, science and engineering fundamentals and Production and Industrial Engineering specialization to the solution of complex Production and Industrial Engineering problems.

PO 2: Problem Analysis Identify, formulate, research literature and analyze complex Production and Industrial Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3: Design/ Development of Solutions Design solutions for complex Engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO 4: Conduct investigations of complex Engineering problems Use research-based knowledge and research methods including analysis, interpretation of data and synthesis of information to provide valid conclusions.

PO 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.

PO 6: The Engineer and Society Apply contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO 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.

PO 8: Ethics Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9: Individual and Team Work Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 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.

PO 11: Project Management and Finance Demonstrate knowledge and understanding of 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.

PO 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.

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DEPARTMENT OF MECHANICAL ENGINEERING	
REGULATION & SEMESTER:	**2017 - I**
SUBJECT CODE & NAME:	HS8151 - Communicative English
CO'S	**COURSE OUTCOMES**
CO1	Students will acquire wide knowledge in all the four skills such as listening, speaking, reading and writing
CO2	Students will be able to write effectively for a variety of professional and social settings.
CO3	Students will be able to share ideas and concepts in proper pronunciation, structure, appropriate use and style of the English Language as well as the application areas of English communication
CO4	Students will be able to prepare, organize, and deliver an engaging oral presentation.
CO5	Students will become active readers who can articulate their own interpretations with an awareness and curiosity for other perspectives.
SUBJECT CODE & NAME:	MA8151 -Engineering Mathematics - I
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To apply both the limit definition and rules of differentiation to differentiate functions.
CO2	To apply Differentiation in Maxima and Minima problems
CO3	To Evaluate integrals both by using Riemann's and the fundamental theorem of calculus
CO4	To compute multiple integrals, area, volume, integrals in polar coordinates in addition to change of order and change of variables
CO5	To evaluate the integrals using techniques of integration, such as substitution, partial fractions and integration by parts

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SUBJECT CODE & NAME:	PH8151 - Engineering Physics
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Understand the elastic behavior and thermal properties of materials.
CO2	Understand the properties and applications of wave and fiber optics
CO3	Understand thermal properties of the material.
CO4	Understand Quantum mechanical behavior of the material
CO5	Understand the crystal structure and growing methods of crystal
SUBJECT CODE & NAME:	CY8151 - Engineering Chemistry
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To Know and develop innovative methods to produce soft water for boiler feed by various treatment process.
CO2	Explain role of adsorption phenomena and various catalytic types and its key properties
CO3	Students able to know about significance and properties of alloy making and its application on phase diagram.
CO4	To explain about analysis and manufacture of various types of fuel.
CO5	To Know about the importance and application of energy sources and energy storage devices.
SUBJECT CODE & NAME:	GE8151 - Problem Solving and Python Programming
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Develop algorithmic solutions to simple computational problems
CO2	Read, write, execute by hand simple Python programs.
CO3	Structure simple Python programs for solving problems.
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries
CO6	Read and write data from/to files in Python Programs.

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SUBJECT CODE & NAME:	GE8152 - Engineering Graphics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform Freehand Sketching Of Basic Geometrical Constructions And Multiple Views Of Objects and conic sections.
CO2	Develop Orthographic Projections Of Lines And Plane Surfaces
CO3	Draw projections of solids
CO4	Draw projections of development of surfaces
CO5	Visualize and to project isometric and perspective sections of simple solids
SUBJECT CODE & NAME:	GE8161- Problem Solving and Python Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write, test, and debug simple Python programs.
CO2	Implement Python programs with conditionals and loops.
CO3	Develop Python programs step-wise by defining functions and calling them.
CO4	Use Python lists, tuples, dictionaries for representing compound data.
CO5	Read and write data from/to files in Python.
SUBJECT CODE & NAME:	BS8161-Physics and Chemistry Laboratory
CO'S	**COURSE OUTCOMES**
CO1	Student will have knowledge to Analyze the particle size & acceptance ankle using laser.
CO2	Student will be able to Apply the principle of ultrasonic interferometer
CO3	Student will be able to understand the principles of spectrometer grating
CO4	Students can Analyze the thermal conductivity of a bad conductor
CO5	Student will be able to Apply the elastic behavior of material

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REGULATION & SEMESTER:	2017 - II
SUBJECT CODE & NAME:	HS8251 - Technical English
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Read various types of texts adapting different reading strategies
CO2	Write letters and reports effectively in formal and informal situations.
CO3	Speak confidently and communicate with others effectively in order to improve their interview skills.
CO4	Use the language perfectly without grammatical errors and by using a wide range of vocabulary.
CO5	Use the technical information properly according to business situations.
SUBJECT CODE & NAME:	MA8251- Engineering Mathematics - II
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To understand the concept of Eigen values and Eigen vectors, diagonalization of Matrix, symmetric matrices, positive definite matrices and similar matrices
CO2	To evaluate Gradient, Divergence and Curl of a Vector point functions and related identities.
CO3	To evaluate a Line, Surface and Volume integrals by using Gauss, Stokes and Green's Theorems and their verification.
CO4	To understand the concept of Analytic functions, conformal mapping and Complex integration
CO5	To understand the concept of Laplace Transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients

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SUBJECT CODE & NAME:	PH8251 - Materials Science
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the phase diagrams.
CO2	Understand the properties, preparation and applications of ferrous alloys
CO3	Understand the mechanical properties material.
CO4	Understand properties and applications of the magnetic, dielectric and super conducting materials
CO5	Understand the properties, preparation methods and applications of new materials
SUBJECT CODE & NAME:	BE8253 Basic Electrical, Electronics and Instrumentation Engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand electric circuits and working principle of electrical machines
CO2	understanding the concept of various electronic devices
CO3	choose appropriate instruments for electrical measurements for a specific application
SUBJECT CODE & NAME:	GE8291 Environmental Science and Engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To Know about the Scope and important of Environmental Science and values of Biodiversity.
CO2	Students will capable to identify Problems related to various Environmental Pollutions and its Control & Prevention.
CO3	Students will understand the Natural resources and sensible use of resources for sustainable lifestyles
CO4	To acquire the knowledge about social problems related to energy and the environmental production.
CO5	To know about the importance of population explosion & family welfare programmer and application of information technology in environment.

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SUBJECT CODE & NAME:	GE8292 Engineering Mechanics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Illustrate the statics of particles in equilibrium
CO2	Analyze the rigid body in equilibrium
CO3	Evaluate the properties of surfaces and solids
CO4	Calculate dynamic forces exerted in rigid body
CO5	Determine the friction and its effects, rigid body dynamics
SUBJECT CODE & NAME:	GE8261 Engineering Practices Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipments to join the structures.
CO3	Carry out the basic machining operations
CO4	Make the sheet metal models
CO5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
CO6	Carry out basic home electrical works and appliances
CO7	Measure the electrical quantities
CO8	Elaborate on the components, gates, soldering practices.
SUBJECT CODE & NAME:	BE8261 Basic Electrical, Electronics and Instrumentation Engineering Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Ability to determine the speed characteristic of different electrical machines
CO2	Ability to design simple circuits involving diodes and transistors
CO3	Ability to use operational amplifiers

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REGULATION & SEMESTER:	2017 - III
SUBJECT CODE & NAME:	MA8353 Transforms and Partial Differential Equations
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Understand how to solve the given standard partial differential equations.
CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
CO4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
CO5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
SUBJECT CODE & NAME:	ME8391 Engineering Thermodynamics
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Apply the first law of thermodynamics for simple open and closed systems.
CO2	Know second law of thermodynamics and apply to open and closed systems
CO3	Study Ranking cycle to steam power plant and compare few cycle improvement methods
CO4	Derive simple thermodynamic relations of ideal and real gases
CO5	Calculate the properties of gas mixtures and moist air and its use in psychometric processes

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SUBJECT CODE & NAME:	CE8394 Fluid Mechanics and Machinery
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Apply Mathematical knowledge to predict the properties and characteristics of a fluid.
CO2	Analyze and calculate major and minor losses associated with pipe flow in piping networks.
CO3	Mathematically predict the nature of physical quantities
CO4	Critically analyze the performance of pumps
CO5	Critically analyze the performance of turbines
SUBJECT CODE & NAME:	ME8351 Manufacturing Technology - I
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Explain different metal casting processes, associated defects, merits and demerits
CO2	Compare different metal joining processes.
CO3	Summarize various hot working and cold working methods of metals.
CO4	Work on various sheet metal making processes.
CO5	Distinguish various methods of manufacturing plastic components.
SUBJECT CODE & NAME:	EE8353 Electrical Drives and Controls
CO'S	COURSE OUTCOMES
CO1	Able to understand the basics of electric drives and to discuss the thermal considerations.
CO2	Able to analyze characteristics of different types of drive motors.
CO3	Able to explain the different types of starters.
CO4	Able to elucidate the speed control of DC drives.
CO5	Able to elucidate the speed control of AC drives.

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SUBJECT CODE & NAME:	ME8361 Manufacturing Technology Laboratory - I
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Demonstrate the safety precautions exercised in the mechanical workshop.
CO2	Make the work piece as per given shape and size using Lathe.
CO3	Join two metals using arc welding or gas welding
CO4	Use sheet metal fabrication tools and make simple tray and funnel.
CO5	Use different molding tools, patterns and prepare sand molds.
SUBJECT CODE & NAME:	ME8381 Computer Aided Machine Drawing
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Follow the drawing standards, Fits and Tolerances
CO2	Re-create part drawings, sectional views and assembly drawings as per standards
SUBJECT CODE & NAME:	EE8361 Electrical Engineering Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Ability to perform speed characteristic of different electrical machine
SUBJECT CODE & NAME:	HS8381 Interpersonal Skills / Listening & Speaking
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Listen and respond appropriately.
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal

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REGULATION & SEMESTER:	2017 - III
COURSE CODE & NAME:	MA8353 Transforms and Partial Differential Equations
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Understand how to solve the given standard partial differential equations.
CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
CO4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
CO5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
COURSE CODE & NAME:	ME8381 COMPUTER AIDED MACHINE DRAWING
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Follow the drawing standards, Fits and Tolerances
CO2	Re-create part drawings, sectional views and assembly drawings as per standards

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COURSE CODE & NAME:	ME8391 Engineering Thermodynamics
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply the first law of thermodynamics for simple open and closed systems.
CO2	Know second law of thermodynamics and apply to open and closed systems
CO3	Study Ranking cycle to steam power plant and compare few cycle improvement methods
CO4	Derive simple thermodynamic relations of ideal and real gases
CO5	Calculate the properties of gas mixtures and moist air and its use in psychometric processes
COURSE CODE & NAME:	CE8394 Fluid Mechanics and Machinery
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply Mathematical knowledge to predict the properties and characteristics of a fluid.
CO2	Analyze and calculate major and minor losses associated with pipe flow in piping networks.
CO3	Mathematically predict the nature of physical quantities
CO4	Critically analyses the performance of pumps
CO5	Critically analyses the performance of turbines
COURSE CODE & NAME:	ME8351 Manufacturing Technology - I
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain different metal casting processes, associated defects, merits and demerits
CO2	Compare different metal joining processes.
CO3	Summarize various hot working and cold working methods of metals.
CO4	Work on various sheet metal making processes.
CO5	Distinguish various methods of manufacturing plastic components.

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COURSE CODE & NAME:	EE8353 Electrical Drives and Controls
COS	**COURSE OUTCOMES**
	Student will be,
CO1	Able to understand the basics of electric drives and to discuss the thermal considerations.
CO2	Able to analyze characteristics of different types of drive motors.
CO3	Able to explain the different types of starters.
CO4	Able to elucidate the speed control of DC drives.
CO5	Able to elucidate the speed control of AC drives.
COURSE CODE & NAME:	ME8361 Manufacturing Technology Laboratory - I
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Demonstrate and fabricate different types of components using the machine tools
COURSE CODE & NAME:	CE6461 Fluid Mechanics and Machinery Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Ability to use the measurement equipments for flow measurement
CO2	Ability to do performance trust on different fluid machinery
COURSE CODE & NAME:	EE8361 Electrical Engineering Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform speed characteristics of different electrical machines

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REGULATION & SEMESTER:	2017 - IV
COURSE CODE & NAME:	MA8452 Statistics and Numerical Methods
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
CO2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
CO3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
CO4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
CO5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications
COURSE CODE & NAME:	ME8492 Kinematics of Machinery
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Discuss the basics of mechanism
CO2	Calculate velocity and acceleration in simple mechanisms
CO3	Develop CAM profiles
CO4	Solve problems on gears and gear trains
CO5	Examine friction in machine elements
COURSE CODE & NAME:	HS8461 ADVANCED READING AND WRITINGY
COS	**COURSE OUTCOMES**
CO1	Write different types of essays.
CO2	Write winning job applications.
CO3	Read and evaluate texts critically.
CO4	Display critical thinking in various professional contexts

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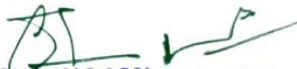**With Education and Ethics, we create Excellence**

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COURSE CODE & NAME:	ME8451 Manufacturing Technology– II
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Explain the mechanism of material removal processes
CO2	Describe the constructional and operational features of centre lathe and other special purpose lathes.
CO3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.
CO4	Summarize numerical control of machine tools and write a part program
CO5	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.
COURSE CODE & NAME:	CE83951 STRENGTH OF MATERIALS FOR MECHANICAL ENGINEERS
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
CO2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
CO3	Apply basic equation of simple torsion in designing of shafts and helical spring
CO4	Calculate the slope and deflection in beams using different methods.
CO5	Analyze and design thin and thick shells for the applied internal and external pressures
COURSE CODE & NAME:	CE8381 STRENGTH OF MATERIALS AND FLUID MECHANICS AND MACHINERY LABORATORY
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.
CO2	Use the measurement equipment's for flow measurement.
CO3	Perform test on different fluid machinery

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COURSE CODE & NAME:	ME8491 Engineering Metallurgy
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
CO2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.
CO3	Clarify the effect of alloying elements on ferrous and non-ferrous metals
CO4	Summarize the properties and applications of non metallic materials.
CO5	Explain the testing of mechanical properties.
COURSE CODE & NAME:	ME8493 Thermal Engineering-I
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply thermodynamic concepts to different air standard cycles and solve problems.
CO2	Solve problems in single stage and multistage air compressors
CO3	Explain the functioning and features of IC engines, components and auxiliaries.
CO4	Calculate performance parameters of IC Engines.
CO5	Explain the flow in Gas turbines and solve problems
COURSE CODE & NAME:	ME8462 Manufacturing Technology Laboratory–II
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Use different machine tools to manufacturing gears
CO2	Use different machine tools for finishing operations
CO3	Manufacture tools using cutter grinder
CO4	Develop CNC part programming

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REGULATION & SEMESTER:	2017- V
COURSE CODE & NAME:	ME8595 Thermal Engineering-II
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Solve problems in Steam Nozzle
CO2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters
CO3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.
CO4	Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers
CO5	Solve problems using refrigerant table / charts and psychometric charts
COURSE CODE & NAME:	ORO551 RENEWABLE SOURCES OF ENERGY
COS	**COURSE OUTCOMES**
CO1	Discuss the importance and Economics of renewable Energy
CO2	Discuss the method of power generation from Solar Energy
CO3	Discuss the method of power generation from Wind Energy
CO4	Explain the method of power generation from Bio Energy
CO5	Explain the Tidal energy, Wave Energy, OTEC, Hydro energy, Geothermal Energy, Fuel Cells and Hybrid Systems.

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COURSE CODE & NAME:	ME8593 DESIGN OF MACHINE ELEMENTS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the influence of steady and variable stresses in machine component design
CO2	Apply the concepts of design to shafts, keys and couplings.
CO3	Apply the concepts of design to temporary and permanent joints.
CO4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.
CO5	Apply the concepts of design to bearings.
COURSE CODE & NAME:	ME8501 Metrology and Measurements
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Describe the basic concepts of measurements to apply on various metrological instruments
CO2	Explain the principles of linear and angular measurement tools used in industrial applications
CO3	Explain the procedure for conducting computer aided inspection
CO4	Demonstrate the techniques of form measurement used for industrial components
CO5	Discuss various measuring techniques of mechanical properties in industrial applications
COURSE CODE & NAME:	ME8594 Dynamics of Machines
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Find static and dynamic forces of mechanisms
CO2	Calculate the balancing masses and their locations of reciprocating and rotating masses
CO3	Determine the frequency of free vibration
CO4	Compute the frequency of forced vibration and damping coefficient
CO5	Calculate the governor variables and estimate the gyroscopic effect on automobiles, ships and airplanes

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COURSE CODE & NAME:	ME8511 KINEMATICS AND DYNAMICS LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain gear parameters, kinematics of mechanisms, gyroscopic effect and working of lab equipment's
CO2	Determine mass moment of inertia of mechanical element, governor effort and range sensitivity, natural frequency and damping coefficient, torsional frequency, critical speeds of shafts, balancing mass of rotating and reciprocating masses, and transmissibility ratio.
COURSE CODE & NAME:	ME8512 Thermal Engineering Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials
CO2	Conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient
CO3	Conduct tests on radioactive heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity
CO4	Conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor
CO5	Conduct tests to evaluate the performance of refrigeration and air conditioning test rigs
COURSE CODE & NAME:	ME8513 Metrology and Measurements Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Measure the gear tooth dimensions, angle using sine bar, straightness and flatness, thread parameters, temperature using thermocouple, force, displacement, torque and vibration
CO2	Calibrate the venire, micrometer and slip gauges and setting up the comparator for the inspection

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REGULATION & SEMESTER:	2017 - VI
COURSE CODE & NAME:	ME8651 Design of Transmission Systems
COS	
	Student will be able to,
CO1	Apply the design concepts to belts, chains and rope drives
CO2	Apply the design concepts Design spur, helical gears
CO3	Apply the design concepts Design worm and bevel gears
CO4	Apply the design concepts Design gear boxes
CO5	Apply the concepts of design to cams, clutches and brakes
COURSE CODE & NAME:	MG6851 Principles of Management
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Understand managerial functions and organization
CO2	Understand of planning techniques
CO3	Understanding of organizing an organization
CO4	Demonstrate the concepts of directing
CO5	Understanding of controlling
COURSE CODE & NAME:	ME8691 COMPUTER AIDED DESIGN AND MANUFACTURING
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics
CO2	Explain the fundamentals of parametric curves, surfaces and Solids
CO3	Summarize the different types of Standard systems used in CAD
CO4	Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machine
CO5	Summarize the different types of techniques used in Cellular Manufacturing and FMS

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COURSE CODE & NAME:	ME8692 Finite Element Analysis
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Summarize the basics of finite element formulation
CO2	Apply finite element formulations to solve one dimensional Problems
CO3	Apply finite element formulations to solve two dimensional scalar Problems
CO4	Apply finite element method to solve two dimensional Vector problems
CO5	Apply finite element method to solve problems on iso parametric element and dynamic Problems
COURSE CODE & NAME:	ME8693 HEAT AND MASS TRANSFER
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems
CO2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems
CO3	Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems
CO4	Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems
CO5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications

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COURSE CODE & NAME:	ME8694 HYDRAULICS AND PNEUMATICS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the Fluid power and operation of different types of pumps.
CO2	Summarize the features and functions of Hydraulic motors, actuators and Flow control valves
CO3	Explain the different types of Hydraulic circuits and systems
CO4	Explain the working of different pneumatic circuits and system
CO5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.
COURSE CODE & NAME:	ME8681 C.A.D. / C.A.M. Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Draw 3D and Assembly drawing using CAD software
CO2	Demonstrate manual part programming with G and M codes using CAM software
COURSE CODE & NAME:	ME8682 Design and Fabrication Project
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and Fabricate the machine elements or the mechanical product
CO2	Demonstrate the working model of the machine element or the mechanical product
COURSE CODE & NAME:	HS8581 Professional Communication Skills - Laboratory Based
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Make effective presentations
CO2	Participate confidently in Group Discussions.
CO3	Attend job interviews and be successful in them.
CO4	Develop adequate Soft Skills required for the workplace

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REGULATION & SEMESTER:	2017 - VII
COURSE CODE & NAME:	ME8792 Power Plant Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the layout, construction and working of the components inside a thermal power plant.
CO2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants
CO3	Explain the layout, construction and working of the components inside nuclear power plants.
CO4	Explain the layout, construction and working of the components inside Renewable energy power plants
CO5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy
COURSE CODE & NAME:	ME8793 PROCESS PLANNING AND COST ESTIMATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Select the process, equipment and tools for various industrial products.
CO2	Prepare process planning activity chart.
CO3	Explain the concept of cost estimation
CO4	Compute the job order cost for different type of shop floor.
CO5	Calculate the machining time for various machining operations.
COURSE CODE & NAME:	ME8712 Technical Seminar
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand and comprehend any given problem related to mechanical engineering field.

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COURSE CODE & NAME:	ME8791 Mechatronics
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.
CO2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.
CO3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing
CO4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering
CO5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies
COURSE CODE & NAME:	ME8073 Unconventional Machining Process
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Explain the need for unconventional machining processes and its classification
CO2	Compare various thermal energy and electrical energy based unconventional machining processes.
CO3	Summarize various chemical and electro-chemical energy based unconventional machining processes
CO4	Explain various nano abrasives based unconventional machining processes
CO5	Distinguish various recent trends based unconventional machining processes.

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COURSE CODE & NAME:	ME8099 Robotics
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the concepts of industrial robots, classification, specifications and coordinate systems. Also summarize the need and application of robots in different sectors.
CO2	Illustrate the different types of robot drive systems as well as robot end effectors
CO3	Apply the different sensors and image processing techniques in robotics to improve the ability of robots
CO4	Develop robotic programs for different tasks and familiarize with the kinematics motions of robot.
CO5	Examine the implementation of robots in various industrial sectors and interpolate the economic analysis of robots
COURSE CODE & NAME:	ME8711 Simulation and Analysis Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB
CO2	Analyze the stresses and strains induced in plates, brackets and beams and heat transfer problems
CO3	Calculate the natural frequency and mode shape analysis of 2D components and beams
COURSE CODE & NAME:	ME8781 Mechatronics Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems
CO2	Demonstrate the functioning of control systems with the help of PLC and microcontrollers

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REGULATION & SEMESTER:	2017 - VIII
COURSE CODE & NAME:	MG8591 Principles of Management
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
COURSE CODE & NAME:	MG8091 ENTREPRENEURSHIP DEVELOPMENT
COS	COURSE OUTCOMES
	Student will be able to,
CO	Upon completion of the course, students will be able to gain knowledge and skills needed to run a business successfully
COURSE CODE & NAME:	ME8811 Project Work
COS	COURSE OUTCOMES
CO1	Students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology

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