

DEPARTMENT OF MECHANICAL ENGINEERING

2019-20

COURSE OUTCOMES

YEAR / SEM: I / I HS8151-COMMUNICATIVE ENGLISH

No.	Course Outcomes
C101.1	Speak and write clearly, confidently and comprehensively participate effectively in informal conversations; introduce themselves to their friends and express opinions in English.
C101.2	Cohesively and coherently write without grammatical errors, using a wide range of vocabulary and organizing the ideas logically on a given topic.
C101.3	Interpret different genres of texts adopting various reading strategies and to write comprehensively.
C101.4	Listen, view and comprehend different spoken discourses/excerpts, different accents and to write short essays of a general kind and personal letters and emails in English.
C101.5	Demonstrate the role of a variety of technologies in communicating information elaborately on the ideas and opinions relevant in different situations.

YEAR / SEM: I / I MA8151-ENGINEERING MATHEMATICS – I

No.	Course Outcomes
C102.1	Learn both the limit definition and rules of differentiation to differentiate functions.
C102.2	Summarize partial differentiation to solve maxima and minima problems.
C102.3	Apply integration to calculate multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
C102.4	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
C102.5	Develop solutions to various techniques in solving differential equations of higher order.

YEAR / SEM: I / I PH8151 -ENGINEERING PHYSICS

No.	Course Outcomes
C103.1	Gain knowledge on the basics of properties of matter and its applications.
C103.2	Summarize concepts of waves and optical devices and their applications in fiber optics.
C103.3	Assess the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers.
C103.4	Generalize the advanced physics concepts of quantum theory and its applications in tunneling microscopes.
C103.5	Schematize the basics of crystals, their structures and different crystal growth techniques.

YEAR / SEM: I / I CY8151-ENGINEERING CHEMISTRY

No.	Course Outcomes
C104.1	Define the boiler feed water requirements, list out the related problems and label the water treatment techniques.

C104.2	Analyze the basic concepts of phase rule and its applications for single and two component systems and to illustrate the purpose and significance of alloys.
C104.3	Summarize the preparation, properties and applications of engineering materials.
C104.4	Classify the types of fuels, investigate the calorific value calculations, manufacture of solid, liquid and gaseous fuels.
C104.5	Demonstrate the Principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.

YEAR / SEM: I / I GE8151-PROBLEM SOLVING AND PYTHON PROGRAMMING

No.	Course Outcomes
C105.1	Define algorithmic solutions to simple computational problems and to write, and execute simple Python programs.
C105.2	Execute simple Python programs for solving problems.
C105.3	Understand the concept of functions in Python program.
C105.4	Demonstrate compound data using Python lists, tuples, and dictionaries.
C105.5	Compose, read and write data from/to files in Python programs.

YEAR / SEM: I / I GE8152-ENGINEERING GRAPHICS

No.	Course Outcomes
C106.1	Differentiate various conics and demonstrate multiple views from pictorial views with appropriate scales.
C106.2	Schematize orthographic projections of points, lines and planes.
C106.3	Exhibit different positions of solids with respect to the plane of projections and entities.
C106.4	Analyze various types of sectioning of solids and its development.
C106.5	Design the pictorial views of solids by isometric drawings.

YEAR / SEM: I / I GE8161-PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

No.	Course Outcomes
C107.1	Write, test, and debug simple Python programs.
C107.2	Implement Python programs with conditionals and loops.
C107.3	Design and develop Python programs step-wise by defining functions and calling them.
C107.4	List out Python lists, tuples, dictionaries for representing compound data.
C107.5	Perform, read and write data from/to files in Python.

YEAR / SEM: I / I BS8161-PHYSICS AND CHEMISTRY LABORATORY

No.	Course Outcomes
C108.1	Summarize the classical and quantum electron theories, and energy band structures.
C108.2	Analyze the basics of semiconductor physics and its applications in various devices.
C108.3	Determine the water quality parameters through volumetric and instrumental analysis.
C108.4	Determine dissolved oxygen level in the water sample.
C108.5	Determine the amount of chloride presents the water sample.

YEAR / SEM: I / II HS8251-TECHNICAL ENGLISH

No.	Course Outcomes
C109.1	Speak, write and convincingly express their opinions, initiate discussions, negotiate, argue using appropriate communicative strategies.
C109.2	Write cohesively and coherently and flawlessly, avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
C109.3	Interpret different genres of texts, infer implied meanings and evaluate it for ideas as well as for method of presentation.
C109.4	Comprehend different spoken excerpts critically and infer unspoken and implied meanings and write reports and winning job applications.
C109.5	Demonstrate the different components of grammar and speak appropriately and effectively in varied formal and informal contexts.

YEAR / SEM: I / II MA8251-ENGINEERING MATHEMATICS –II

No.	Course Outcomes
C110.1	Evaluate eigenvalues and eigenvectors, diagonalization of a matrix, symmetric matrices, positive definite matrices and similar matrices.
C110.2	Solve gradient, divergence and curl of a vector point function and related identities to apply concept of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
C110.3	Discuss the analytic functions, conformal mapping.
C110.4	Discuss complex integration and application of residue theorem.
C110.5	Explain the concepts of Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.

YEAR / SEM: I / II PH8251- MATERIALS SCIENCE

CO1	the students will have knowledge on the various phase diagrams and their applications
CO2	the students will acquire knowledge on Fe-Fe ₃ C phase diagram, various microstructures and alloys
CO3	the students will get knowledge on mechanical properties of materials and their measurements
CO4	the students will gain knowledge on magnetic, dielectric and superconducting properties of materials
CO5	the students will understand the basics of ceramics, composites and nano materials

YEAR / SEM: I / II BE8253-BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING

CO1	Understand electric circuits and working principles of electrical machines
CO2	Understand the concepts of various electronic devices
CO3	Understand the principles of operations of various electrical machines

CO4	Classify the types of materials used to make electronic devices and circuits and also its properties
CO5	Choose appropriate instruments for electrical measurement for a specific application

YEAR / SEM: I / II GE8291-ENVIRONMENTAL SCIENCE AND ENGINEERING

CO1	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection.
CO2	Public awareness of environmental is at infant stage.
CO3	Ignorance and incomplete knowledge has lead to misconceptions
CO4	Development and improvement in std. of living has lead to serious environmental disasters
CO5	Understand the effect of human population on environment and the role of ICT in assessing the population explosion on environment.

YEAR / SEM: I / II GE8292 – ENGINEERING MECHANICS

CO1	Illustrate the vectorial and scalar representation of forces and moments
CO2	Analyse 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 the effects by the laws of friction

YEAR / SEM: I / II GE8261- ENGINEERING PRACTICES LABORATORY

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 models using sheet metal works
CO5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings. Carry out basic home electrical works and appliances, Measure the electrical quantities, Elaborate on the components, gates, soldering practices

YEAR / SEM: I / II BE8261- BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING LABORATORY

CO1	Ability to determine the speed characteristic of different electrical machine
CO2	Ability to design simple circuits involving diodes and transistor
CO3	Ability to use operational amplifier
CO4	Perform load test on various electrical machines
CO5	Understand the working principle of signal measuring devices

YEAR / SEM: II / III MA8353 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

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.

YEAR / SEM: II / III ME8391 - ENGINEERING THERMODYNAMICS

CO1	Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions.
CO2	Apply second law of thermodynamics to open and closed systems and calculate entropy and availability.
CO3	Apply Rankine 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

YEAR / SEM: II / III CE8394- FLUID MECHANICS AND MACHINERY

CO1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
CO2	Can analyze and calculate major and minor losses associated with pipe flow in piping networks.
CO3	Can mathematically predict the nature of physical quantities
CO4	Can critically analyze the performance of pumps
CO5	Can critically analyze the performance of turbines.

YEAR / SEM: II / III ME8351 - MANUFACTURING TECHNOLOGY –I

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	Explain various sheet metal making processes.
CO5	Distinguish various methods of manufacturing plastic components.

YEAR / SEM: II / III EE8353- ELECTRICAL DRIVES AND CONTROLS

CO1	Classify different types of drives and select drives based on parameters
CO2	Understand drive motor characteristics
CO3	Learn motor starting methods for different types of motors
CO4	Explain the difference between conventional and advanced motor speed control methods of dc drives
CO5	Explain the difference between conventional and advanced motor speed control methods of ac drives

YEAR / SEM: II / III ME8361- MANUFACTURING TECHNOLOGY LABORATORY – I

CO1	Demonstrate the safety precautions exercised in the mechanical workshop.
CO2	Make the workpiece as per given shape and size using Lathe.
CO3	Join two metals using arc welding.
CO4	Use sheet metal fabrication tools and make simple tray and funnel.
CO5	Use different moulding tools, patterns and prepare sand moulds.

YEAR / SEM: II / III ME8381- COMPUTER AIDED MACHINE DRAWING - LAB

CO1	Follow the drawing standards, Fits and Tolerances
CO2	Re-create part drawings, sectional views and assembly drawings as per standards
CO3	Understand the importance of drawing standards, fits and tolerances
CO4	Learn about 2d drafting
CO5	Trained to do 3d modeling using any standard cad software

YEAR / SEM: II / III EE8361 -ELECTRICAL ENGINEERING LABORATORY

CO1	Ability to perform speed characteristics of different electrical machines
CO2	Perform load test on ac and dc motors
CO3	Understand the perform characteristics of motors
CO4	Familiar with methods to regulate alternators
CO5	Understand the working principle of starters

YEAR / SEM: II / III HS8381 -INTERPERSONAL SKILLS/LISTENING & SPEAKING

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
CO5	Improve the reading and listening ability

YEAR / SEM: II / IV MA8452- STATISTICS AND NUMERICAL METHODS

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.

YEAR / SEM: II / IV ME8492 -KINEMATICS OF MACHINERY

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

YEAR / SEM: II / IV ME8451-MANUFACTURING TECHNOLOGY – II

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	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.
CO5	Summarize numerical control of machine tools and write a part program.

YEAR / SEM: II / IV ME8491-ENGINEERING METALLURGY

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.

YEAR / SEM: II / IV CE8395 - STRENGTH OF MATERIALS FOR MECHANICAL ENGINEERS

CO1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes
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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

YEAR / SEM: II / IV ME8493 - THERMAL ENGINEERING- I

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.

YEAR / SEM: II / IV ME8462 MANUFACTURING TECHNOLOGY LABORATORY – II

CO1	use different machine tools to manufacturing gears
CO2	Ability to use different machine tools to manufacturing gears.
CO3	Ability to use different machine tools for finishing operations
CO4	Ability to manufacture tools using cutter grinder
CO5	Develop CNC part programming

YEAR / SEM: II / IV CE8381-STRENGTH OF MATERIALS AND FLUID MECHANICS AND MACHINERY LABORATORY

CO1	Ability to perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.
CO2	Perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.
CO3	Predict the behavior of the material under impact conditions.
CO4	Use the measurement equipment's for flow measurement.

CO5

Perform test on different fluid machinery.

YEAR / SEM: II / IV HS8461 -ADVANCED READING AND WRITING

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.
CO5	Develop reading and writings skills required for writing SOP, LOR & vision statement.

YEAR / SEM: III / V ME85895- THERMAL ENGINEERING - II

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

YEAR / SEM: III / V ME 8593 - DESIGN OF MACHINE ELEMENTS

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

YEAR / SEM: III / V ME8501- METROLOGY AND MEASUREMENTS

CO1	Describe the concepts of measurements to apply in various metrological instruments
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CO2	Outline the principles of linear and angular measurement tools used for 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

YEAR / SEM: III / V ME8594- DYNAMICS OF MACHINES

CO1	Calculate static and dynamic forces of mechanisms
CO2	Calculate the balancing masses and their locations of reciprocating and rotating masses
CO3	Compute the frequency of free vibration
CO4	Compute the frequency of forced vibration and damping coefficient
CO5	Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobile, ships and airplanes

YEAR / SEM: III / V OAT552-INTERNAL COMBUSTION ENGINES

CO1	Explain the basics of IC engines
CO2	Describe the construction and working of Petrol engines
CO3	Discuss the construction and working of Diesel engines
CO4	Explain the significance of the cooling and lubrication systems in IC engines
CO5	Outline the application of modern technology in IC engines

YEAR / SEM: III / V ME8511- KINEMATICS AND DYNAMICS LABORATORY

CO1	Explain gear parameters, kinematics of mechanisms
CO2	Discuss gyroscopic effect and working of lab equipments
CO3	Determine mass moment of inertia of mechanical element
CO4	Find governor effort and range sensitivity
CO5	Determine natural frequency and damping coefficient, torsional frequency, critical speed of shafts, balancing mass of rotating and reciprocating masses

YEAR / SEM: III / V ME8512- THERMAL ENGINEERING LABORATORY

CO1	Conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials thermal conductivity of conducting and non-conducting materials.
CO2	Conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient
CO3	Conduct tests on radiative 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

YEAR / SEM: III / V ME8513 -METROLOGY AND MEASUREMENTS LABORATORY

CO1	Measure the gear tooth dimensions and angle using sine bar
CO2	Measure straightness and flatness and thread parameters
CO3	Ability to measure the dimensions of an engineering component.
CO4	Measure temperature using thermocouple and force, displacement, torque and vibration
CO5	Calibrate the vernier, micrometer and gauges and set up comparator for

YEAR / SEM: III / VI ME8651- DESIGN OF TRANSMISSION SYSTEMS

CO1	Apply the concepts of design to belts, chains and rope
CO2	Apply the concepts of design to spur, helical gears
CO3	Apply the concepts of design to worm and bevel gears
CO4	Apply the concepts of design to gear boxes
CO5	Apply the concepts of design to cams, brakes and clutches

YEAR / SEM: III / VI MG8691- COMPUTER AIDED DESIGN AND MANUFACTURING

CO1	Explain the 2D and 3D transformations, Clipping algorithms, 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 and CNC programming concepts to develop Part Programming for lathe and milling machines
CO5	Summarize the different types of technologies used in cellular manufacturing and FMS

YEAR / SEM: III / VI- HEAT AND MASS TRANSFER

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 radiations and apply these principles to radiative heat transfer between different types of surfaces and solve problems
CO5	Apply diffusion and convection mass transfer equations and correlations to solve problems for different applications

YEAR / SEM: III / VI ME8692- FINITE ELEMENT ANALYSIS

CO1	Summarize the basics of finite element formulation
CO2	Apply finite element formulation to solve one dimensional problems
CO3	Apply finite element formulation to solve two dimensional scalar problems
CO4	Apply finite element formulation to solve two dimensional vector problems
CO5	Apply finite element method to solve problems on isoparametric element and dynamic problems

YEAR / SEM: III / V : ME8694- HYDRAULICS AND PNEUMATICS

CO1	Explain the Fluid power and operation of different types of pumps
CO2	Summarize the features and functions of different types of Hydraulic motors, actuators, Flow control valves
CO3	Explain the different types of Hydraulic circuits and system
CO4	Explain the different types of Pneumatic circuits and systems
CO5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems

YEAR / SEM: III / VI ME8091- YEAR / SEM : III / VI : ME8091 AUTOMOBILE ENGINEERING

CO1	Recognize the various parts of the automobile and their functions and materials
CO2	Discuss the engine auxiliary system and engine emission control
CO3	Distinguish the working of different types of transmission systems
CO4	Explain the Steering, Brake and Suspension System
CO5	Predict possible alternate sources of energy for IC engines

YEAR / SEM: III / VI ME8681-CAD/CAM LABORATORY

CO1	Draw 3D and Assembly Drawing using CAD software
CO2	Describe the features of CNC Machine tool
CO3	Describe modern control systems such as FANUC and SIEMENS systems
CO4	Demonstrate manual part programming with G and M Codes using CAM
CO5	Describe rapid prototyping

YEAR / SEM: III / VI ME8682 -DESIGN AND FABRICATION PROJECT

CO1	Design and fabricate the machine element or the mechanical product
CO2	Demonstrate the working model of the machine element or the mechanical product
CO3	Develop conceptual and engineering design of any mechanical components
CO4	Ability to fabricate them using different manufacturing tools.
CO5	Develop Design skills and fabrication Process

YEAR / SEM: III / VI HS8581- PROFESSIONAL COMMUNICATION

No	Course Outcomes
C317.1	Explain the basics of soft skills and self grooming
C317.2	Make effective presentation
C317.3	Participate confidently in Group Discussions
C317.4	Attend job interviews and be successful in them
C317.5	Develop adequate Soft Skills required for the workplace

YEAR / SEM: IV/ VII ME6701-POWER PLANT ENGINEERING

CO1	Ability to summarize different types of power plants and boilers
CO2	Ability to describe different equipments used in steam power plants
CO3	Ability to describe different components used in hydel and nuclear power plants
CO4	Ability to demonstrate different types of diesel and gas turbine power plants
CO5	Ability to describe various renewable energy power plants and also to analyse economics of conventional power plants

YEAR / SEM: IV / VII ME6702- MECHATRONICS

CO1	Ability to differentiate various elements of mechatronics systems and demonstrate different kinds of sensors.
CO2	Ability to interpret the functions and applications of microprocessor and microcontroller.
CO3	Ability to apply the knowledge of the programmable interfacing elements for controlling different devices
CO4	Ability to write PLC programs using timer, counter and inter relays for automation.
CO5	Ability to summarize different electrical actuators like stepper and servo motors and potential of Mechatronics systems with different case studies.

YEAR / SEM: IV / VII ME6703 -COMPUTER INTEGRATED MANUFACTURING

CO1	Ability to understand about CAD/CAM and its integration with CIM
CO2	To know about computer aided process planning, material requirement planning (MRP) Enterprise resource planning (ERP)
CO3	Describe group technology and Production flow analysis
CO4	To familiarize FMS and its applications and Automatic Guided Vehicle system.
CO5	To understand various concepts of Industrial Robot and its control system

YEAR / SEM: IV / VII GE6757- TOTAL QUALITY MANAGEMENT

CO1	They should be able to characterize various concepts of quality management, have a focused oriented goal towards customer feedback services.
CO2	Ability to impart quality management principles within a team and different approaches towards product development.
CO3	The student should be able to understand the traditional tools of quality, its concept and applications to manufacturing processes.
CO4	Ability to understand the basis of process capability ,six sigma concepts and Taguchi quality function
CO5	Ability to audit, document for ISO 9000-ISO 9001-2008, AND QS 9000-ISO 14000 and implement TQM approaches in manufacturing and service sectors.

YEAR / SEM: IV / VII ME6005- PROCESS PLANNING AND COST ESTIMATION

CO1	Ability to summarize the basic design concept of product by using the process planning.
CO2	Ability to interpret the method of study techniques for process planning and Ability to calculate for various production processes.
CO3	Ability to estimate various elements of cost.

CO4	Ability to estimate production cost for forging welding and foundry shop.
CO5	Ability to calculate the machining time for milling, shaping, planning and grinding.

YEAR / SEM: IV / VII ME6012- MAINTENANCE ENGINEERING

sCO1	Ability to summarize the principles and practices of Maintenance Engineering.
CO2	Ability to interpret the maintenance categories and TPM.
CO3	Ability to elaborate condition monitoring techniques and devices.
CO4	Ability to explain the repair methods for basic machine elements.
CO5	Ability to explain the repair methods for material handling equipment.

YEAR / SEM: IV / VII ME6711- SIMULATION AND ANALYSIS LABORATORY

CO1	Ability to solve basic problems in vibration using MATLAB
CO2	Ability to evaluate stress analysis of truss, plates, shells, Axi-symmetric components using ANSYS
CO3	Ability to synthesis thermal stress analysis of cylindrical shells and plates using ANSYS
CO4	Ability to analyze vibration of spring mass systems and model analysis of beam using ANSYS
CO5	Ability to analyze harmonic, transient and spectrum of simple system using ANSYS

YEAR / SEM: IV / VII ME6712- MECHATRONICS LABORATORY

CO1	Ability to demonstrate the programmer in 8085 microprocessor.
CO2	Ability to design basic electrical, hydraulic and pneumatic system
CO3	Ability to summarize the concept of transducers.
CO4	Ability to apply PLC in mechanical system.
CO5	Ability to analysis of basic hydraulic, pneumatic and electrical circuits using software.

YEAR / SEM: IV / VII ME6713 -COMPREHENSION

CO1	To make the students understand the conventional machining process and behavior of materials under various circumstances.
CO2	The student will gain knowledge of various management tools and application of these methods on manufacturing processes.

CO3	At the end of the course the student should be able to analyze concepts of thermodynamics and apply its uses and applications on various cycles.
CO4	Ability to synthesize problem and develop and design new solutions based on designing software's like Auto CADD, CATIA, ANSYS
CO5	Ability to apply concepts of theoretical studies to conventional problems in their domain of choice.

YEAR / SEM: IV / VIII MG6863- ENGINEERING ECONOMICS

CO1	Ability to recognize the flow of economy by understanding the fundamental concepts of economy.
CO2	Ability to interpret time value of money by utilizing value Engineering.
CO3	Ability to calculate cash flow by using various methods.
CO4	Ability to judge replacements by developing simple probabilistic model.
CO5	Ability to estimate depreciation by various methods and enable to adopt alternatives for inflation & depreciation.

YEAR / SEM: IV / VIII IE6605 -PRODUCTION PLANNING AND CONTROL

CO1	Ability to explain the various components and types of continuous product development.
CO2	Ability to explain the describe the work study,method study and time study procedure and PMTS
CO3	Ability to compare the product planning and process planning
CO4	Ability to plan production scheduling and scheduling rules and Gantt chart
CO5	Ability to discuss about the inventory control

YEAR / SEM: IV / VIII ME6016- ADVANCED IC ENGINES

CO1	Ability to describe different stages of SI engine combustion and calculating geometrical parameters of carburetor
CO2	Ability to describe different stages of combustion in CI Engine
CO3	Ability to describe about different emission norms and its control
CO4	Ability to describe about use of alternative fuels
CO5	Ability to summarize recent trends in IC engine

YEAR / SEM: IV / VIII ME6811- PROJECT WORK

CO1	Ability to identify the problems in the present scenario
CO2	Ability to interpret the cause and effects of the problems
CO3	Ability to investigate the methods to reduce the problems with team.
CO4	Ability to design the problems using modern tool
CO5	Ability to analyze the designed product and to evaluate the application of the product to the society need

