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DEPARTMENT OF MECHANICAL ENGINEERING

Regulation 2017 : COURSE OUTCOMES:

SEMESTER – I

HS8151-Communicative English

Course Code	Course Outcomes
C101.1	Define the fundamentals of engineering after learning the rules of English Grammar
C101.2	Read articles of the general kind in magazines and newspapers
C101.3	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.
C101.4	Comprehend conversations and short talks delivered in English
C101.5	Write short essays of the general kind and personal letters and e-mails in English.
C101.6	Analyze and identify the root for an effective managerial skills through different spoken discourse and excerpts

MA8151- Engineering Mathematics - I

Course Code	Course Outcomes
C102.1	Use both the limit definition and rules of differentiation to differentiate functions.
C102.2	Apply differentiation to solve maxima and minima problems.
C102.3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
C102.4	Apply various techniques in solving differential equations.
C102.5	To study how differential equation help to solve real time problems
C102.6	Introduce the concepts of Differentiation and Integration that will create an ability to deal with Differential Equations and Multiple integrals.

PH8151-Engineering Physics

Course Code	Course Outcomes
C103.1	To understand the basic concepts of elastic behavior of materials and evaluate the structural stability of beams.
C103.2	To understand the behavior of different oscillatory wave motion and the concept of LASER action, also discuss about the propagation of light in optical fibers, comparing various types of fibers and its applications in Medical and Engineering fields.
C103.3	Remembering functional ideas of thermal physics and compare the thermal conductivity of different materials to meet the specific needs
C103.4	Describe and analyzing the quantum nature of radiation and matter to solve the real time societal and technological problems.
C103.5	To understand the possible crystal structures and to analyze various growth techniques in the view of increasing demand of crystals for various Engineering and Technological applications.
C103.6	To make the students understand the fundamentals of Physics to solve complex engineering problems for benefit of the society

CY8151   Engineering Chemistry

Course Code	Course Outcomes
C104.1	Analyze boiler troubles with latest technologies and equipments using external and internal treatment methods.
C104.2	It provides basic knowledge in the field of absorption and catalysis.
C104.3	Knowledge of alloys gives an idea about the manufacturing process in various industries
C104.4	Analyze issues related to fuels and their synthesis and able to understand working of IC and diesel engines
C104.5	To understand the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells
C104.6	The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning

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GE8151   Problem Solving and Python Programming

Course Code	Course Outcomes
C105.1	Develop algorithmic solutions to simple computational problems.
C105.2	Demonstrate programs using simple Python statements and expressions
C105.3	Explain control flow and functions concept in Python for solving problems
C105.4	Use Python data structures – lists, tuples & dictionaries for representing compound data.
C105.5	Explain files, exception, modules and packages in Python for solving problems.
C105.6	Develop python programs to illustrate concise and efficient algorithms

GE8152   Engineering Graphics

Course Code	Course Outcomes
C106.1	How to draw different engineering curves, draw different orthographic projections.
C106.2	Illustrate different views of points, lines and planes inclined to both HP and VP in first quadrant.
C106.3	Develop the projections of simple solids inclined to any one plane
C106.4	Categorize Section and develop various solids
C106.5	Evaluate to Draw 3D projections of simple solids by Perspective by visual ray method and Isometric projections
C106.6	Build an engineering component using Paper drawing as well as in CAD

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GE8161   Problem Solving and Python Programming Laboratory

Course Code	Course Outcomes
C107.1	Develop solutions to simple computational problems using Python programs.
C107.2	Solve problems using conditionals and loops in Python.
C107.3	Develop Python programs by defining functions and calling them.
C107.4	Use Python lists, tuples and dictionaries for representing compound data.
C107.5	Develop Python programs using files.
C107.6	Developing python programming using pre define function

BS8161   Physics and Chemistry Laboratory

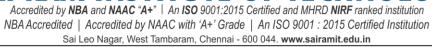| Course Code	Course Outcomes
C108.1	To apply the physics principles of Thermal physics and Properties of Matter to evaluate properties of materials
C108.2	To understand measurement technique and usage of new instrument in Optics for real time application in Engineering .
C108.3	Apply the knowledge of semiconducting material, to evaluate the band gap of material useful for engineering solutions.
C108.4	Able to analyze the quality of water for domestic and industrial purpose
C108.5	Used to find out the emf for different metallic solutions from which electrode potential is determined
C108.6	To acquire knowledge about the conductivity of acids and bases

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II Semester

HS8251   Technical English

Course Code	Course Outcomes
C109.1	Define the fundamentals of engineering after learning the rules of English Grammar
C109.2	Read technical text and write area-specific text effortlessly.
C109.3	Listen and comprehend lectures and talks in their area of specialization successfully.
C109.4	Speak appropriately and effectively in varied formal and informal contexts.
C109.5	Write reports and winning job applications
C109.6	Analyze and identify the root for an effective managerial skills through different spoken discourse and excerpts

MA8251   Engineering Mathematics - II

Course Code	Course Outcomes
C110.1	Introduce the concepts of Eigen value and Eigenvectors which help to find the stability of the systems in engineering
C110.2	Define and understand the concepts of vector calculus, needed for finding solutions in all engineering discipline problems.
C110.3	Develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of the electric current.
C110.4	Evaluate real integrals by applying concept of complex integration
C110.5	Understand and apply the knowledge of Laplace Transforms in solving system of linear differential equations.
C110.6	Introduces fundamental knowledge in mathematics, that is applicable in the Engineering aspects.

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PH8251   Materials Science

Course Code	Course Outcomes
C111.1	To analyze the various composition of alloy with respect to temperature to determine the relation between microstructure and properties of material
C111.2	To understand Iron carbon phase diagram and to strengthen the mechanical properties by alloying and by subjecting to thermal treatment
C111.3	To demonstrate various technique involved to test the mechanical properties
C111.4	Understanding the concept of magnetic , dielectric and superconducting properties of materials
C111.5	To understand the properties of new engineering material and its applications.
C111.6	To analyze and to improve the strength of the material for mechanical application

BE8253   Basic Electrical, Electronics and Instrumentation Engineering

Course Code	Course Outcomes
C112.1	Discuss the essentials of electric DC circuits
C112.2	Discuss the essentials of electric AC circuits
C112.3	Discuss the basic operation of electric machines and transformers
C112.4	To understand the fundamentals of electronic circuit constructions
C112.5	Introduction to measurement methods
C112.6	To understand the function of instruments for electric circuits

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GE8291   Environmental Science and Engineering

Course Code	Course Outcomes
C113.1	To interpret the relationship between living organisms and the environment and to identify the threats to global biodiversity
C113.2	To identify and prevent the problems related to the pollution of air, water, soil, marine, etc
C113.3	To understand the importance of natural resources and to conserve it for future generation
C113.4	To analyze the social issues of the environment to be a part of sustainable development
C113.5	To create awareness and sustainable population growth and know the contribution of information technology in environmental management
C113.6	To study the integrated themes and biodiversity, natural resources, pollution control, waste management for protecting environment from degradation

GE8292   Engineering Mechanics

Course Code	Course Outcomes
C114.1	Analysis the forces acting on the Object under static conditions.
C114.2	Explain the rigid bodies under equilibrium condition.
C114.3	Identify the surfaces and solids with respect to center of gravity and centroid.
C114.4	Examine the forces acting on the object under the dynamic conditions.
C114.5	Deduct the rigid bodies under friction force.
C114.6	Estimate the various engineering application and their principles

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GE8261   Engineering Practices Laboratory

Course Code	Course Outcomes
C115.1	Hands on experience on welding, sheet metal and lathe works
C115.2	Experience the plumping and carpentry work
C115.3	Demonstration on centrifugal pump and air conditioning working principles
C115.4	Measurement of Electrical quantities, earthing procedures, wiring methods etc
C115.5	Study of Electronic components and equipments – Resistor, colour coding measurement of AC signal parameter, Gates , Circuits etc
C115.6	Provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

BE8261   Basic Electrical, Electronics and Instrumentation Engineering Laboratory

Course Code	Course Outcomes
C116.1	Able to determine the characteristics of different DC machines
C116.2	Able to determine the characteristics of different AC machines
C116.3	Able to use operational amplifiers
C116.4	Able to design simple circuits involving diodes and transistors
C116.5	Able to analysis the different theorems and circuits
C116.6	Able to analysis the different measurement systems

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III Semester

MA8353   Transforms and Partial Differential Equations

Course Code	Course Outcomes
C201.1	Evaluating the various model of homogeneous and non homogeneous partial differential equations which helps to solve engineering problems.
C201.2	Determine the Fourier coefficients in the Fourier series expansion of a given function and which play a vital role in analysing various complex problems in engineering.
C201.3	Analyzing the one dimensional, two dimensional heat equation and one dimensional wave equation by using the concept of Fourier series, which describes the distribution in a given region over time
C201.4	Determine Fourier transform for a given function and use them to evaluate the definite integrals which helps in analysing the differential equation and also applied in quantum mechanics
C201.5	Determine Z transforms and standard function and use them to solve the difference equation, which helps to investigate the discrete time signals.
C201.6	Understanding of the mathematical principles on transforms and partial differential equation would provide them the ability to formulate and solve the physical problems of engineering

ME8351   Manufacturing Technology - I

Course Code	Course Outcomes
C202.1	Explain different metal casting processes, associated defects, merits and demerits
C202.2	Compare different metal joining processes.
C202.3	Summarize various hot working and cold working methods of metals.
C202.4	Explain various sheet metal making processes
C202.5	To Learn about Special Forming Processes
C202.6	Distinguish various methods of manufacturing plastic components

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ME8391   Engineering Thermodynamics

Course Code	Course Outcomes
C203.1	Solve first law thermodynamics based types of problems.
C203.2	Solve second law thermodynamics based types of problems.
C203.3	Compare the various types of steam power cycles.
C203.4	Study the thermodynamic relations
C203.5	Analyze the various psychrometry processes.
C203.6	Extend the ideas in implementation of mini/major project

CE8394   Fluid Mechanics and Machinery

Course Code	Course Outcomes
C204.1	To understand the Fluid properties and Fluid characteristics
C204.2	Discuss various losses in fluid flow
C204.3	To solve fluid problems using Dimensional analysis method
C204.4	Discuss the working and performance of different types pumps
C204.5	Discuss the working and performance of different types turbines
C204.6	Analyse fluid systems and solve real time problems

EE8353   Electrical Drives and Controls

Course Code	Course Outcomes
C205.1	Study the fundamental of electrical drives and to select the power rating of drive motors with regard to thermal overloading
C205.2	Compare the different types of electrical machines, their mechanical characteristics and braking methods
C205.3	Explore the different methods of starting D.C motors and induction motors
C205.4	Analyse the conventional and solid state speed control of dc drives and its applications
C205.5	Outline the conventional and solid state speed control of ac drive and its applications
C205.6	Recommend the speed control of the electrical drives and applications essential for them to work in different industries

ME8361   Manufacturing Technology Laboratory - I

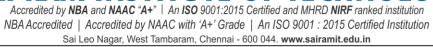| Course Code	Course Outcomes
C206.1	Explain different metal casting processes, associated defects, merits and demerits
C206.2	Compare different metal joining processes.
C206.3	Summarize various hot working and cold working methods of metals.
C206.4	Explain various sheet metal making processes
C206.5	To Learn about Special Forming Processes
C206.6	Distinguish various methods of manufacturing plastic components

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ME8381　　　　　Computer Aided Machine Drawing

Course Code	Course Outcomes
C207.1	Study of capabilities of software for Drafting and Modeling
C207.2	Apply the drafting knowledge in curves and orthographic projection
C207.3	Understand the modelling of solid models
C207.4	Extend the knowlege in plan of residential buildings
C207.5	Draw the sectional view of standard models
C207.6	Adequite knowlege in converting 2D in to 3D

EE8361　　　　　Electrical Engineering Laboratory

Course Code	Course Outcomes
C208.1	Describe the performance of load test on dc shunt and series motor, speed control of DC shunt motor and to tabulate the O.C.C and load characteristics of DC shunt and DC series generator
C208.2	Explain the load test, OC and SC test on a single phase transformer
C208.3	Examine the regulation of an alternator by EMF and MMF methods
C208.4	Determine the V curves and inverted V curves of synchronous Motor
C208.5	Predit the load test of 3 phase squirrel cage induction motor and speed control of 3 phase slip ring induction motor
C208.6	Select ac and dc starters for different electrical machines and Justify the speed characteristics

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HS8381   Interpersonal Skills / Listening & Speaking

Course Code	Course Outcomes
C209.1	Define appropriate techniques with suitable language and speech pattern
C209.2	Discuss the social issues in the group discussion
C209.3	Apply the acquired skills confidently in interviews
C209.4	Take part in debates and public speaking
C209.5	Prioritize the ideas relevantly and coherently in writing and speaking
C209.6	Develop the skills for writing technical reports and letters

IV Semester

MA8452   Statistics and Numerical Methods

Course Code	Course Outcomes
C210.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C210.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C210.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C210.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
C210.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications

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ME8492   Kinematics of Machinery

Course Code	Course Outcomes
C211.1	Discuss the basics of mechanism
C211.2	Calculate velocity and acceleration in simple mechanisms
C211.3	Develop CAM profiles
C211.4	Solve problems on gears and gear trains
C211.5	Examine friction in machine elements

ME8451   Manufacturing Technology – II

Course Code	Course Outcomes
C212.1	Explain the mechanism of material removal processes.
C212.2	Describe the constructional and operational features of centre lathe and other special purpose lathes.
C212.3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.
C212.4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.
C212.5	Summarize numerical control of machine tools and write a part program.

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ME8491   Engineering Metallurgy

Course Code	Course Outcomes
C213.1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
C213.2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.
C213.3	Clarify the effect of alloying elements on ferrous and non-ferrous metals
C213.4	Summarize the properties and applications of non metallic materials.
C213.5	Explain the testing of mechanical properties. .

CE8395   Strength of Materials for Mechanical Engineers

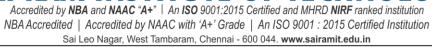| Course Code	Course Outcomes
C214.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
C214.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C214.3	Apply basic equation of simple torsion in designing of shafts and helical spring
C214.4	Calculate the slope and deflection in beams using different methods.
C214.5	Analyze and design thin and thick shells for the applied internal and external pressures.

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ME8493   Thermal Engineering- I

Course Code	Course Outcomes
C215.1	Apply thermodynamic concepts to different air standard cycles and solve problems.
C215.2	Solve problems in single stage and multistage air compressors
C215.3	Explain the functioning and features of IC engines, components and auxiliaries.
C215.4	Calculate performance parameters of IC Engines.
C215.5	Explain the flow in Gas turbines and solve problems.

ME8462   Manufacturing Technology Laboratory – II

Course Code	Course Outcomes
C216.1	use different machine tools to manufacturing gears
C216.2	Ability to use different machine tools to manufacturing gears.
C216.3	Ability to use different machine tools for finishing operations
C216.4	Ability to manufacture tools using cutter grinder
C216.5	Develop CNC part programming

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CE8381   Strength of Materials and Fluid Mechanics and Machinery Laboratory

Course Code	Course Outcomes
C217.1	Perform Tension test on Solid materials.
C217.2	Perform Torsion, Hardness test on Solid materials.
C217.3	Perform Compression test on Solid materials.
C217.4	Perform Deformation test on Solid materials.
C217.5	Use the measurement equipments for flow measurement.

HS8461   Advanced Reading and Writing

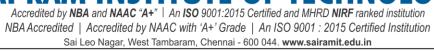| Course Code	Course Outcomes
C218.1	Write different types of essays.
C218.2	Write winning job applications.
C218.3	Read and evaluate texts critically.
C218.4	Display critical thinking in various professional contexts.
C218.5	Prioritize the ideas relevantly and coherently in writing and speaking
C218.6	Develop the skills for writing technical reports and letters

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V Semester

ME8595   Thermal Engineering- II

Course Code	Course Outcomes
C301.1	Solve problems in Steam Nozzle
C301.2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters.
C301.3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.
C301.4	Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers
C301.5	Solve problems using refrigerant table / charts and psychrometric charts

ME8593   Design of Machine Elements

Course Code	Course Outcomes
C302.1	Explain the influence of steady and variable stresses in machine component design.
C302.2	Apply the concepts of design to shafts, keys and couplings.
C302.3	Apply the concepts of design to temporary and permanent joints.
C302.4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.
C302.5	Apply the concepts of design to bearings.
C302.6	Distinguish various methods of manufacturing plastic components

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ME8501   Metrology and Measurements

Course Code	Course Outcomes
C303.1	Describe the concepts of measurements to apply in various metrological instruments
C303.2	Outline the principles of linear and angular measurement tools used for industrial applications
C303.3	Explain the procedure for conducting computer aided inspection
C303.4	Demonstrate the techniques of form measurement used for industrial components
C303.5	Discuss various measuring techniques of mechanical properties in industrial applications
C303.6	Extend the ideas in implementation of mini/major project

ME8594   Dynamics of Machines

Course Code	Course Outcomes
C304.1	Calculate static and dynamic forces of mechanisms.
C304.2	Calculate the balancing masses and their locations of reciprocating and rotating masses.
C304.3	Compute the frequency of free vibration.
C304.4	Compute the frequency of forced vibration and damping coefficient.
C304.5	Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes.
C304.6	Analyse fluid systems and solve real time problems

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ME8511   Kinematics and Dynamics Laboratory

Course Code	Course Outcomes
C305.1	Explain gear parameters, kinematics of mechanisms
C305.2	Explain gyroscopic effect and working of lab equipments.
C305.3	Determine mass moment of inertia of mechanical element
C305.4	Determine governor effort and range sensitivity
C305.5	Determine natural frequency and damping coefficient
C305.6	Determine torsional frequency, critical speeds of shafts, balancing mass of rotating and reciprocating masses, and transmissibility ratio.

ME8511   Kinematics and Dynamics Laboratory

Course Code	Course Outcomes
C305.1	Explain gear parameters, kinematics of mechanisms
C305.2	Explain gyroscopic effect and working of lab equipments.
C305.3	Determine mass moment of inertia of mechanical element
C305.4	Determine governor effort and range sensitivity
C305.5	Determine natural frequency and damping coefficient
C305.6	Determine torsional frequency, critical speeds of shafts, balancing mass of rotating and reciprocating masses, and transmissibility ratio.

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ME8512   Thermal Engineering Laboratory

Course Code	Course Outcomes
C306.1	conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials.
C306.2	conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.
C306.3	conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.
C306.4	conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.
C306.5	conduct tests to evaluate the performance of refrigeration and airconditioning test rigs.

ME8513 Metrology and Measurements Lab

Course Code	Course Outcomes
C307.1	Measure the gear tooth dimensions, angle using sine bar
C307.2	Measure straightness and flatness,thread parameters, temperature using thermocouple
C307.3	Measure the force, displacement, torque and vibration.
C307.4	Calibrate the vernier
C307.5	Calibrate the micrometer