Course Outcomes (CO)

(R 2013)

Branch: B.E, Mechanical Engineering

Course Code: C101 Course Name:HS6151 Technical English – I

C101.1	Read different genres of texts adopting various reading strategies.
C101.2	Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
C101.3	Listen/view and comprehend different spoken discourses/excerpts in different accents.
C101.4	Speak clearly, confidently, comprehensibly.
C101.5	Communicate with one or many listeners using appropriate communicative strategies.

Course Code: C102 Course Name: MA6151 Mathematics – I

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 integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
C102.5	Apply various techniques in solving differential equations.

Course Code:C103 Course Name: PH6151 Engineering Physics – I

C103.1	Acoustics, Production and the applications of Ultrasonics in Engineering and Medical Fields.
C103.2	Interference, different types of lasers and its application in various fields.
C103.3	Fiber optics and optical fiber and its applications.
C103.4	Development of quantum mechanics and its necessary, wave equations and its applications, X - Ray.
C103.5	Crystallography and can able to calculate the crystal parameters

Course Code: C104 Course Name:CY 6151 Engineering Chemistry – I

C104.1	To make the students conversant with basics of polymer chemistry.
C104.2	To make the student acquire sound knowledge of second law of thermodynamics and second law based derivations of importance in engineering applications.
C104.3	To acquaint the student with concepts of important photophysical and photochemical processes and spectroscopy.
C104.4	To develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and appreciate the purpose and significance of alloys.
C104.5	To acquaint the students with the basics of nano materials, their properties and applications.

Course Code: C105 Course Name:GE6151 Computer Programming

C105.1	Explain the components of computer and logical operations.
C105.2	Convert the number system and their representation.
C105.3	Discuss hardware and software devices
C105.4	Summarize network fundamentals.
C105.5	Plan the logic using flowchart and develop algorithm to write a C Program.

Course Code: C106 Course Name: GE6152 Engineering Graphics

C106.1	Ability to familiarize with the fundamentals and standards of Engineering graphics
C106.2	Ability to perform freehand sketching of basic geometrical constructions and multiple views of objects
C106.3	Ability to Project orthographic projections of lines and plane surfaces
C106.4	Ability to draw projections of solids and development of surfaces
C106.5	Ability to visualize and to project isometric and perspective sections of simple solids

Course Code: C107 Course Name:GE6161 Computer Practices Laboratory

C107.1	Prepare data using MS-word & Excel to visualize graphs, charts in MS-Excel.
C107.2	Outline the logic using flowchart for a given problem and to program using Switch case & Control structures
C107.3	Develop logic using decision making & looping statements
C107.4	Apply passing parameters using Arrays & Functions
C107.5	Construct structure and Union for a given database and to bring out the importance of Unions over structure

Course Code:C108 Course Name: GE6162 Engineering Practices Laboratory

C108.1	Ability to Fabricate carpentry components and pipe connections including plumbing works
C108.2	Ability to Use welding equipments to join the structures
C108.3	Ability to Carry out the basic machining operations
C108.4	Ability to Make the models using sheet metal works
C108.5	Ability to Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings

Course Code:C109 Course Name:GE6163 Physics and Chemistry Laboratory - I

C109.1	To provide the basic practical exposure to all the engineering and technological streams in the field of physics. .
C109.2	To provide the basic practical exposure to all the engineering and technological streams in the field of chemistry.
C109.3	The students are able to know about the water containing impurities and some physical parameters.
C109.4	To gain the knowledge about light, sound, laser, fiber optics and magnetism.
C109.5	To develop the knowledge of conductometric titration and viscometry

Course Code:C110 Course Name:HS6251 Technical English – II

C110.1	Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
C110.2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
C110.3	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
C110.4	Speak convincingly, express their opinions clearly.
C110.5	Initiate a discussion, negotiate, argue using appropriate communicative strategies.

Course Code:C111 Course Name:MA6251 Mathematics – II

C111.1	Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
C111.2	Gradient, divergence and curl of a vector point function and related identities.
C111.3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
C111.4	Analytic functions, conformal mapping and complex integration.
C111.5	Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.

Course Code:C112 Course Name:PH6251 Engineering Physics – II

C112.1	Electric conduction, electrical conductivity, carrier concentration of metals.
C112.2	Semiconductors, carrier concentration of semiconductors, Hall effect and semiconductor devices.
C112.3	Types of magnetic materials, ferro magnetic materials, magnetic storage devices, Super conductors and their properties and applications.
C112.4	Dielectrics, properties and its applications, ferro electricity.
C112.5	Modern engineering materials, Nano materials and Carbon nano tubes.

Course Code:C113 Course Name:CY6251 Engineering Chemistry – II

C113.1	To make the students conversant with boiler feed water requirements, related problem and water treatment techniques.
C113.2	Principles of electrochemical reactions, redox reactions in corrosion of materials and methods for corrosion prevention and protection of materials.
C113.3	Principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.
C113.4	Preparation, properties and applications of engineering materials.
C113.5	Types of fuels, calorific value calculations, manufacture of solid, liquid and gaseous fuels.

Course Code:C114 Course Name:GE6252 Basic Electrical and Electronics Engineering

C114.1	Ability to understand basic theorems used in Electrical circuits and the different components
C114.2	Ability to explain about the function and characteristics of electrical machines.
C114.3	Ability to explain about the fundamentals of semiconductor and applications.
C114.4	Ability to explain about the principles of digital electronics.
C114.5	Ability to explain about the knowledge of communication.

Course Code: C115 Course Name: GE6253 Engineering Mechanics

C115.1	Ability to illustrate the vectorial and scalar representation of forces and moments
C115.2	Ability to analyse the rigid body in equilibrium
C115.3	Ability to evaluate the properties of surfaces and solids
C115.4	Ability to calculate dynamic forces exerted in rigid body
C115.5	Ability to determine the friction and the effects by the laws of friction

Course Code: C116 Course Name:GE6261Computer Aided Drafting and Modeling Laboratory

C116.1	Sketch simple figures with title block using AutoCAD software commands.
C116.2	Sketch curves like parabola, spiral and involute of square & circle and draw the orthographic projection of simple solids.
C116.3	Prepare orthographic projection of simple machine parts and draw a plan of residential building.
C116.4	Sketch simple steel truss and sectional views of simple solids.
C116.5	Prepare 2D multi view drawing from 3D model.

Course Code:C117 Course Name:GE6262 Physics and Chemistry Laboratory -II

C117.1	To provide the basic practical exposure to all the engineering and technological streams in the field of physics. .
C117.2	To provide the basic practical exposure to all the engineering and technological streams in the field of chemistry.
C117.3	The students are able to know about the water containing impurities and some physical parameters.
C117.4	To gain the knowledge about properties of matter, semiconductors and solar cells
C117.5	To develop the knowledge of spectrophotometry.

Course Code:C201 Course Name:MA6351 Transforms and Partial Differential Equations

C201.1	Understand how to solve the given standard partial differential equations.
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.

C201.4	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.
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

Course Code: C202 Course Name:CE6306 Strength of Materials

C202.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes
C202.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment
C202.3	Apply basic equation of simple torsion in designing of shafts and helical spring
C202.4	Calculate the slope and deflection in beams using different methods.
C202.5	Analyze and design thin and thick shells for the applied internal and external pressures

Course Code:C203 Course Name: ME6301 Engineering Thermodynamics

C203.1	Apply the first law of thermodynamics for simple open and closed systems under steadyand unsteady conditions
C203.2	Apply second law of thermodynamics to open and closed systems and calculate entropyand availability
C203.3	Apply Rankine cycle to steam power plant and compare few cycle improvement methods
C203.4	Derive simple thermodynamic relations of ideal and real gases
C203.5	Calculate the properties of gas mixtures and moist air and its use in psychometric Processes

Course Code:C204 Course Name:CE6451 Fluid Mechanics and Machinery

C204.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
C204.2	Can analyse and calculate major and minor losses associated with pipe flow in piping networks
C204.3	Can mathematically predict the nature of physical quantities
C204.4	Can critically analyse the performance of pumps
C204.5	Can critically analyse the performance of turbines

Course Code:C205 Course Name:ME6302Manufacturing Technology – I

C205.1	Explain different metal casting processes, associated defects, merits and demerits
C205.2	Compare different metal joining processes
C205.3	Summarize various hot working and cold working methods of metals
C205.4	Explain various sheet metal making processes
C205.5	Distinguish various methods of manufacturing plastic components

Course Code:C206 Course Name: EE6351Electrical Drives and Controls

C206.1	Students can able to explain different types of electrical machines.
C206.2	Students can able to explain the performance of various machines.
C206.3	Students can able to explain the different methods of starting dc motors and induction motors.
C206.4	Students can able to understand and explain the conventional and solid state dc drives.
C206.5	Students can able to understand and explain the conventional and solid state ac drives.

Course Code:C207 Course Name: ME6311 Manufacturing Technology

Laboratory - I

C207.1	Use different machine tools to manufacturing gears
C207.2	Ability to use different machine tools to manufacturing gears
C207.3	Ability to use different machine tools for finishing operations
C207.4	Ability to manufacture tools using cutter grinder
C207.5	Develop CNC part programming

Course Code:C208 Course Name: CE6461 Fluid Mechanics and Machinery Laboratory

C208.1	Calculate the coefficient of discharge for Orifice meter and Venturimeter.
C208.2	Calibrate the Rotameter and Estimate the friction factor for flow through pipes.
C208.3	Predict performance characteristics of centrifugal pump and submergible pump.
C208.4	Predict performance characteristics of reciprocating pump and gear pump.
C208.5	Predict performance characteristics of turbines.

Course Code:C209 Course Name: EE6365 Electrical Engineering Laboratory

C209.1	Ability to perform Load and speed characteristics of dc machines.
C209.2	Ability to perform Load and speed characteristics of Induction motor.
C209.3	Ability to perform Load and performance characteristics of transformers.
C209.4	Ability to perform Load and performance characteristics of alternators.
C209.5	Ability to understand various ac and dc motor starters.

Course Code:C210 Course Name: MA6452 Statistics and Numerical Methods

C210.1	Identify small, large samples and apply testing of hypothesis.
C210.2	Apply ANOVA test to design of experiments.
C210.3	Determine the solution of algebraic and transcendal system of linear equations.
C210.4	To interpolate the values of unknown functions using Newton's Formula
C210.5	Estimate the numerical values of the derivatives and integrals of unknown function difference equations

Course Code:C211 Course Name: ME6401 Kinematics of Machinery

C211.1	Ability to discuss the basics of mechanism
C211.2	Ability to calculate velocity and acceleration in simple mechanisms
C211.3	Ability to develop CAM profiles
C211.4	Ability to Solve problems on gears and gear trains
C211.5	Ability to examine friction in machine elements

Course Code:C212 Course Name:ME6402 Manufacturing Technology–II

C212.1	Ability to explain the mechanism of material removal processes
C212.2	Ability to describe the constructional and operational features of centre lathe and other specialpurpose 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	Ability to summarize numerical control of machine tools and write a part program

Course Code:C213 Course Name: ME6403 Engineering Materials and Metallurgy

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

Course Code:C214 Course Name: GE6351 Environmental Science and Engineering

C214.1	Describe the structure and functions of different eco system.
C214.2	Identify the various causes, effects and control measures of different types of pollution.
C214.3	Summarize the over exploitation and their effects of natural resources.
C214.4	Appraise the environmental issues and possible solution.
C214.5	Explain the causes of population growth and explosion.

Course Code:C215 Course Name: ME6404Thermal Engineering

C215.1	Calculate the mean effective pressure and air standard efficiency of different gas power cycles.
C215.2	Calculate the performance test on IC engines.
C215.3	Sketch the velocity diagrams of single and multi-stage turbines.
C215.4	Explain the classification and working principle of various types of air compressors.
C215.5	Calculate properties of moist air and COP of vapor refrigeration systems by using refrigeration table andchart.

Course Code:C216 Course Name: ME6411 Manufacturing Technology Laboratory–II

C216.1	Demonstrate contour milling and generate a spur gear from a cylindrical work piece.
C216.2	Perform helical gear cutting operation and generate gear using hobbing machine.
C216.3	Generate gear using gear shaping machine and demonstrate plain surface grinding operation.
C216.4	Perform cylindrical grinding operation and practice Tool angle grinding with tool and Cutter Grinder.
C216.5	Measure cutting forces in Milling / Turning Process and develop CNC part programming.

Course Code:C217 Course Name:ME6412Thermal Engineering Laboratory - I

C217.1	Sketch the valve timing diagram and port timing diagram for single cylinder four stroke diesel engine and two stroke petrol engine.
C217.2	Calculate the mechanical efficiency of four stroke SI engine by Morse test.
C217.3	Evaluate the performance of four stroke single cylinder CI engine & Predict actual diagram.
C217.4	Evaluate the performance of steam generator and steam turbines.
C217.5	Measure the flash and fire point of various fuel/lubricants.

Course Code:C218 Course Name: CE6315 Strength of Materials Laboratory

C218.1	Evaluate the values of yield stress, breaking stress and ultimate stress of the given specimen under tension test.
C218.2	Conduct the torsion test to determine the modulus of rigidity of given specimen.
C218.3	Justify the Rockwell hardness test over with Brinell hardness and measure the hardness of the given specimen.
C218.4	Examine the stiffness of the open coil and closed coil spring and grade them.
C218.5	Analyze the microstructure and characteristics of specimen.

Course Code:C301 Course Name: ME6501 Computer Aided Design

C301.1	Describe theproductcycledesignprocess,sequentialandconcurrent Engineering.
C301.2	Explain the various types of curves, patches and surfaces and the constructive solid geometry with Boundary representation techniques.
C301.3	Apply the principle of visual realism for line, surface and solid removal algorithms and Explore the techniques involved in shading and coloring.
C301.4	Assemble the machine parts in different interfacing of positions and orientation and Calculate the mass property in the assembly modeling.
C301.5	Appraise the uses of standard for GKS and open GL library.

Course Code:C302 Course Name: ME6502 Heat and Mass Transfer

C302.1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems
C302.2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems
C302.3	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
C302.4	Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems
C302.5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications

Course Code:C303 Course Name: Design of Machine Elements

C303.1	**Explain the influence of steady and variable stresses in machine component design.**
C303.2	**Apply the concepts of design to shafts, keys and couplings**
C303.3	**Apply the concepts of design to temporary and permanent joints**
C303.4	**Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.**
C303.5	**Apply the concepts of design to bearings**

Course Code:C304 Course Name: ME6504 Metrology and Measurements

C304.1	**Describe the concepts of measurements to apply in various metrological instruments**
C304.2	**Outline the principles of linear and angular measurement tools used for industrial applications**
C304.3	**Explain the procedure for conducting computer aided inspection**
C304.4	**Demonstrate the techniques of form measurement used for industrial components**
C304.5	**Discuss various measuring techniques of mechanical properties in industrial applications**

Course Code:C305 Course Name: ME6505 Dynamics of Machines

C305.1	**Calculate static and dynamic forces of mechanisms**
C305.2	**Calculate the balancing masses and their locations of reciprocating and rotating masses**
C305.3	**Compute the frequency of free vibration**
C305.4	**Compute the frequency of forced vibration and damping coefficient.**
C305.5	**Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes**

Course Code:C306 Course Name: GE6075Professional Ethics in Engineering

C306.1	**Distinguish between Moral and Ethics.**
C306.2	**Summarize the moral theories and ethical inquiries.**
C306.3	**Evaluate the result of the engineering projects by applying ethical theories.**
C306.4	**Discuss about professional rights, employ rights and intellectual property rights, safety and risk involved in engineering projects.**
C306.5	**Judge the role of engineer in environmental issues, computer applications, weapons development, multinational corporations and Corporate Social Responsibility.**

Course Code:C307 Course Name: ME6511 Dynamics Laboratory

C307.1	**Review the various types of gears, gear trains, kinematic mechanisms, and universal joints.**
C307.2	**Estimate the mass moment of inertia of axisymmetric objects using Turn table apparatus, bi-filar suspension, compound pendulum and natural frequency for single and double rotor systems, equivalent spring mass system and transverse**
C307.3	**Inspect the critical speed of shaft under the given load conditions and the gyroscopic effect and couple on motorized gyroscope.**
C307.4	**Sketch the characteristic curves of Watt, Porter, Proell and Hartnell governors and motion curves for the given cam follower setup.**
C307.5	**Examine the balancing of rotating masses in dynamic balancing machine.**

Course Code:C308 Course Name: ME6512 Thermal Engineering Laboratory-II

C308.1	**Conduct a test to find thermal conductivity of various engineering materials.**
C308.2	**Measure heat transfer rate in free and forced convection environment.**
C308.3	**Measure emissivity of grey surface.**
C308.4	**Measure the effectiveness of parallel and counter flow heat exchanger.**
C308.5	**Measure COP of refrigeration and air conditioning system and performance of air compressor and fluidized bed cooling tower.**

Course Code:C309 Course Name: ME6513 Metrology and Measurements Laboratory

C309.1	**Check the dimensions and the dimensional deviations of given parts.**
C309.2	**Inspect the dimensions, angularity and parallelism of a given component.**
C309.3	**Construct the torque characteristic curves to various loads at various distances.**
C309.4	**Evaluate the straightness of surfaces and determine size of irregularities on a machined surface.**
C309.5	**Measure the vertical distances or height of objects, taper angle of slope for a given component, various parameters of threads and gear wheel.**

Course Code:C310 Course Name: ME6601 Design of Transmission systems

C310.1	**Design belt drives (flat belt, V-belt), chain drives, rope drives, belt drive pulleys & chain sprockets.**
C310.2	**Design spur and straight helical gears based on strength and wear consideration.**
C310.3	**Design straight bevel gear, worm gear pair and cross helical gear.**
C310.4	**Design various gear boxes (sliding mesh, constant mesh, multispeed) through geometric progression, standard step ratio, ray diagram, kinematics layout.**
C310.5	**Design various cams, clutches, internal and external shoe brakes using basic knowledge acquired from earlier studies.**

Course Code:C311 Course Name: MG6851Principles of Management

C311.1	**Explain the purpose of management & managerial roles in local and global organization.**
C311.2	**Prescribe the decision making model under different conditions.**
C311.3	**Explain the process of staff selection and career development.**
C311.4	**Demonstrate creativity and innovation, and explain the motivational theories.**
C311.5	**Explain the process of different types of control, and planning operations in management.**

Course Code:C312 Course Name:ME6602Automobile Engineering

C312.1	**Explain the various types of chassis, frame and functions of IC engine parts.**
C312.2	**Describe the engine auxiliary system used in SI and CI engine.**
C312.3	**Distinguish between the manual transmission systems with automatic transmission systems.**

C312.4	Demonstrate how the steering, brakes and the suspension system operate.
C312.5	Justify the importance of alternative fuels.

Course Code:C313 Course Name: ME6603 Finite Element Analysis

C313.1	Explain the steps involved in FEA and also the types of weight residual methods.
C313.2	Formulate FE equation for structural, heat transfer and vibration problems.
C313.3	Predict finite element equations for two dimensional thermal and torsion problems.
C313.4	Predict finite element equations for axisymmetric bodies, plate and shell.
C313.5	Apply matrix solution techniques to dynamic problems.

Course Code:C314 Course Name: ME6604 Gas Dynamics and Jet Propulsion

C314.1	Discuss the basic difference between incompressible flow and compressible flow and the effect of Mach number on compressible flow.
C314.2	Compare Fanno flow and Rayleigh flow and calculate the flow properties in Fanno flow and Rayleigh flow.
C314.3	Compute the PrandtlMeyer equation for shock waves.
C314.4	Compare the working of various jet engines and calculate thrust & efficiency in jet propulsion using gas dynamics principles.
C314.5	Classify rocket engines and calculate efficiency in rocket propulsion.

Course Code:C315 Course Name: ME6004 Unconventional Machining Processes

C315.1	Justify the needs of unconventional machining processes.
C315.2	Explain the working principles of Mechanical Energy Based Processes and various process parameters influence on their performance.
C315.3	Differentiate between Electric discharge machining and Wire cut Electric discharge machining.
C315.4	Compare the chemical machining process with electro-chemical machining process.
C315.5	Explain the working principles of thermal energy based processes.

Course Code:C316 Course Name: ME6611 C.A.D. / C.A.M. Laboratory

C316.1	Create 2D and 3D models using modeling software.
C316.2	Understand the CNC control in modern manufacturing system.
C316.3	Prepare CNC part programming and perform manufacturing.
C316.4	Create the CL Data and Post process generation using CAM packages.
C316.5	Apply CAPP in Machining and Turning Centre.

Course Code:C317 Course Name: ME6612 Design and Fabrication Project

C317.1	Develop conceptual and engineering design of any mechanical components and also to fabricate them using different manufacturing tools.

Course Code :C318 Course Name: GE6563 Communication Skills – Laboratory Based

C318.1	Apply appropriate communication skills across settings, purposes, and audiences.
C318.2	Demonstrate knowledge of communication theory and application.
C318.3	Practice critical thinking to develop innovative and well-founded perspectives related to the students' emphases.
C318.4	Build and maintain healthy and effective relationships. Use technology to communicate effectively in various settings and contexts.
C318.5	Demonstrate appropriate and professional ethical behavior.

Course Code:C401 Course Name: ME6701 Power Plant Engineering

C401.1	Explain the layout, construction and working of the components inside a thermal power plant
C401.2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants
C401.3	Explain the layout, construction and working of the components inside nuclear power plants
C401.4	Explain the layout, construction and working of the components inside Renewable energy power plants
C401.5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy product

Course Code:C402 Course Name: ME6702 Mechatronics

C402.1	State the specifications of sensors and choose the suitable sensors for real time applications.
C402.2	Combine the real time control systems with peripheral devices through programmable interface techniques.
C402.3	Test the input output terminals of PLC based control system by interfacing technique.
C402.4	Construct the ladder logic circuits for simple automation system.
C402.5	Design Mechatronics system with the help of microprocessor, PLC and other electrical and electronic Circuits.

Course Code:C403 Course Name:ME6703Computer Integrated Manufacturing Systems

C403.1	Describe the elements of CIM system & an automated system, Production system and mathematical models of production performance & manufacturing control.
C403.2	Discuss the use of computers in process planning, different aspects of planning system and control systems.
C403.3	Solve the simple problems in part coding system in Group Technology and quantitative analysis in cellular manufacturing.
C403.4	Discuss the flexible manufacturing system components, planning & control and Automated Guided Vehicle System.
C403.5	Discuss the Robot anatomy, related attributes, and classification of robots, robot control systems and robot part programming.

Course Code:C404 Course Name: GE6757 Total Quality Management

C404.1	Students will be able to gain basic knowledge in total quality management relevant to both manufacturing and service industry including IT sector
C404.2	Students will be able to implement the basic principles of TQM in manufacturing and service based organization.
C404.3	The student would be able to apply the traditional tools and techniques of quality management to
C404.4	The student would be able to apply the new tools and techniques of quality management to manufacturing and services processes.
C404.5	Students will gain knowledge on Quality systems and International standards

Course Code:C405 Course Name: ME6005Process Planning and Cost Estimation

C405.1	Explain the methods of process planning and the various steps involved in process selection.
C405.2	Examine the various steps involved in process planning activities.
C405.3	Explain the procedure of cost estimation.
C405.4	Estimate the production cost of a given component produced in foundry shop, forging shop & welding shop.
C405.5	Calculate the machining time for different operations performed in lathe, milling, shaping, planning, drilling, boring & grinding.

Course Code:C406 Course Name: ME6012 Maintenance Engineering

C406.1	Ability to understand the principles and objectives of Maintenance Engineering.
C406.2	Ability to describe the various categories of maintenance.
C406.3	Ability to discuss various condition monitoring techniques.
C406.4	Ability to explain the repair methods of beds and slide ways.
C406.5	Ability to explain the repair methods of material handling equipment's.

Course Code:C407 Course Name: ME6711Simulation and Analysis Laboratory

C407.1	Simulate simple problems in vibrations and simple mechanisms using simulation software.
C407.2	Perform analysis of stress, truss/beam and dynamic analysis of mechanical members.
C407.3	Perform two dimensional stress analysis in plate and asymmetric shells.
C407.4	Analyze the temperature distribution in one dimensional heat transfer problems (walls and fins).
C407.5	Analyze the temperature distribution in two dimensional heat transfer problems (plates and shell).

Course Code:C408 Course Name:ME6712Mechatronics Laboratory

C408.1	Ability to create the program for arithmetic functions and the program for sorting, code conversion functions.
C408.2	Ability to formulate the program codes to interface with traffic light controller and stepper motor.
C408.3	Ability to compare the set speed with actual speed of DC motor by interfacing suitable speed sensors.
C408.4	Ability to integrate all the hydraulic, pneumatic and electro pneumatic circuits by using simulation software.
C408.5	Ability to create the program for arithmetic functions and the program for sorting, code conversion functions.

Course Code:C409 Course Name: ME6713 Comprehension

C409.1	Understand and comprehend any given problem related to mechanical engineering field.

Course Code:C410 Course Name: MG6863 Engineering Economics

C410.1	Learn basics of Engineering Economics and optimum costing.
C410.2	Understand Value Engineering and Time Value of Money.
C410.3	Differentiate Cash Dominated and Revenue Dominated Cash flow.
C410.4	Apply suitable cash flow methods for different Situations.
C410.5	Apply Depreciation methods for Individual/Industrial/Public Alternatives.

Course Code:C411 Course Name: IE6605 Production Planning and Control

C411.1	Describe the functions of production control, various production system, different aspects of product development and break even analysis.
C411.2	Describe the concept of Method study, Motion study and work measurement techniques.
C411.3	Perform the analysis of problems in lack of product planning, quantity determination in batch production and analysis of process capabilities in a multi product system.
C411.4	Discuss about production scheduling, production control systems, progress reporting & expediting and techniques for aligning completion times & due dates.
C411.5	Calculate the economic order quantity & economic lot size in inventory control.

Course Code:C412 Course Name: ME6016 Advanced I.C. Engines

C412.1	Explain fuel injection systems in SI engine, types of combustion chamber and combustion process.
C412.2	Explain different types of fuel injection system and combustion chambers of CI engine.
C412.3	Explain the mechanism of pollution formation and the evolution of emission norms.
C412.4	Describe the properties of various alternative fuels, engine modification required and emission characteristic of alternative fuels.
C412.5	Discuss various ignition methods used in I.C engine and electronic engine management system.

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C413.1	Develop the ability to solve a specific problem right from its identification and literature review till finding the successful solution of the same