R2013 – Course Outcome

S.No	Course Outcome
C101/TECHNICAL ENGLISH-I	
C101.1	Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using communicative strategies.
C101.2	Write coherently and flawlessly using a wide diction.
C101.3	Read different genres of texts adopting various reading strategies.
C101.4	Comprehend different spoken discourses in different accents.
C101.5	Communicate in group and to larger audience appropriately.
C101.6	Enable to understand process descriptions and present it in the relevant field.
C102/MATHEMEATICS-1	
C102.1	Find the eigen values and eigen vectors to diagonalise and reduce a matrix to quadratic form.
C102.2	Check the converges, diverges of infinite series
C102.3	find the solutions of algebraic equations solved by iterative methods gets close to the required solution.
C102.4	Obtain the evaluate and envelopes of a given curves by means of radius and centre of curvature
C102.5	Calculate the maxima and minima value functions of two variables
C102.6	Find the area of plain curves and volume of solid using double and triple integrals
C103/ENGINEERING PHYSICS-I	
C103.1	Discuss various crystal structures and different crystal growth techniques
C103.2	Demonstrate the properties of elasticity and heat transfer through objects
C103.3	Explain black body radiation, properties of matter waves and Schrodinger wave equations
C103.4	Illustrate the acoustic requirements, production and application of ultrasonics.
C103.5	Examine the characteristics of laser and optical fiber
C103.6	Improve the property of the materials for the application of commercial devices

C104/ENGINEERING CHEMISTRY-I	
C104.1	Classify polymers and their utility in the industries and describe the techniques of polymerization and properties of polymers
C104.2	Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance and equilibrium constant and its significance
C104.3	Explain the photophysical processes such as fluorescence and phosphorescence and various components of UV and IR spectrophotometer
C104.4	Illustrate the phase transitions of one component and two component systems and the types of alloys and their applications in industries
C104.5	Outline the synthesis, characteristics and the applications of nano materials
C104.6	Knowing the various applications related to photophysical laws
C105 /COMPUTER PROGRAMMING	
C105.1	Demonstrate algorithm, flowchart for various programs
C105.2	Do simple programs using C programming basics
C105.3	Illustrate programs by using arrays and string functions
C105.4	Develop simple programs using functions and pointers
C105.5	Design mini projects with structures.
C105.6	Develop applications using C Programming Language
C106 /ENGINEERING GRAPHICS	
C106.1	Construct engineering curves
C106.2	Sketch all the views of engineering objects in free hand.
C106.3	Draw the projection of points, lines and planes.
C106.4	Draw the projection of solids in any orientation.
C106.5	Develop the section and lateral surfaces of sectioned solids
C106.6	Sketch the solids in perspective and isometric approaches
C107 /COMPUTER PRACTICES LABORATORY	
C107.1	Prepare data using MS office for Presentation and Visualization
C107.2	Design Flow-chart for various problems.
C107.3	Solve Problems using decision making and looping Statements.

C107.4	Develop programs using Arrays, Structures & Unions.
C107.5	Design simple programs using Recursive Functions.
C107.6	Develop mini project using C programs
C108 /ENGINEERING PRACTICES LABORATORY	
C108.1	Learn basic engineering concepts
C108.2	Students will get exposure regarding plumbing pipe connections for motor pump, Houses and turbines.
C108.3	Students will study the joints used in roofs, doors, windows and furnitures.
C108.4	Students will get exposure regarding latest welding operations such as TIG,MIG and Spot welding etc. And basic welding techniques.
C108.5	Students will get hands on experience on basic machining techniques and sheet metal working.
C108.6	Students will get hands basic machining operation in turning. (Lathe).
C109/PHYSICS AND CHEMISTRY LABORATORY	
C109.1	The student will be able to analyze the physical principle involved in the various instruments, also relate the principle to new application.
C109.2	The various experiments in the areas of elasticity, optics, mechanics and thermal physics will nurture the students in all branches of Engineering.
C109.3	The students will be able to think innovatively and also improve the creative skills that are essential for engineering.
C110 /TECHNICAL ENGLISH-II	
C110.1	Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using communicative strategies.
C110.2	Write coherently and flawlessly using a wide diction.
C110.3	Read different genres of texts adopting various reading strategies.
C110.4	Comprehend different spoken discourses in different accents.
C110.5	Communicate in group and to larger audience appropriately.
C110.6	Enable to understand process descriptions and present it in the relevant field.
C111 /MATHEMATICS-II	

C111.1	Apply the vector concepts of vector calculus in engineering disciplines
C111.2	Apply the knowledge of mathematics in solving higher order differential equations with constant coefficients.
C111.3	To have the basic knowledge of differential equation in typical mechanical fields.
C111.4	Understand and apply the knowledge of Laplace transform in solving ordinary differential equation.
C111.5	Understand the standard techniques of complex variable theory and use them to solve core engineering problems.
C111.6	Evaluate real integrals by applying concept of complex integration.
C112 /ENGINEERING PHYSICS-II	
C112.1	Illustrate Classical and Quantum free electron theory & calculate carrier concentration in metals.
C112.2	Describe the carrier concentration in semiconductors and identify the P-type & N-type semiconductor using Hall effect
C112.3	Classify the different types of magnetic and superconducting materials
C112.4	Explain the dielectrics, types of polarization, losses and breakdowns
C112.5	Discuss the properties, preparation and applications of Metallic Alloys, SMA, Nanomaterials, NLO,Biomaterials
C112.6	New Engineering materials can be prepared for the purpose of development of modern devices
C113/ENGINEERING CHEMISTRY-II	
C113.1	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost
C113.2	Substitute metals with conducting polymers and also produce cheaper biodegradable poylmers to reduce environmental pollution

C113.3	Design economically and new methods to synthesize nano materials
C113.4	Apply their knowledge for protection of different metals from corrosion
C113.5	Have the knowledge of converting solar energy into most needy electrical energy efficiently to reduce the environmental pollution
C114 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	
C114.1	Fundamentals of semiconductor and basic theorems used in Electrical circuits
C114.2	Design amplifier circuits under CB, CE, CC Configurations.
C114.3	Design the Adders – Flip-Flops – Registers and Counters with logic gates.
C114.4	Discuss the Principles of Amplitude and Frequency Modulations and various blocks Communication Systems
C114.5	Demonstrate the working of Television systems, FAX machines and micro wave systems.
C115/ENGINEERING MECHANICS	
C115.1	Determine the vector and scalar representation of forces and moments
C115.2	Resolve the rigid body in equilibrium conditions
C115.3	Understand the concept of moment of inertia in different surfaces and solids
C115.4	Calculate the dynamic forces developed in elastic bodies
C115.5	Recognize the effect of friction on general plane motions
C115.6	Understand the general equations of equilibrium conditions
C116/COMPUTER AIDED DRAFTING AND MODELING LABORATORY	
C116.1	Follow the drawing standards, Fits and Tolerances
C116.2	Familiarize in curves, surfaces modeling.
C116.3	Create detailed drawing for structural and machine components for manicuring of a product.
C116.4	Re-create part drawings, sectional views and assembly drawings as per standards.
C116.5	Create 2D and 3D models of Engineering Components
C116.6	Use the software packers for drafting and modelling.
C117 /PHYSICS AND CHEMISTRY LABORATORY - II	
C117.1	The student will be able to analyze the Science concept involved in the various instruments related to the impact of new application.
C117.2	The various experiments in the areas of optics, mechanics and thermal physics will nurture the students in all branches of Engineering.

C117.3	The students will be able to think innovatively and also improve the creative skills that are essential for engineering.
C201 /TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	
C201.1	Analyze Partial Differential Equations in various methods .
C201.2	Solving Fourier Series for different types of functions.
C201.3	Computing the solutions of the heat equation, wave equation and the Laplace equation subject to boundary conditions
C201.4	Deduce the Gaussian function in Self reciprocal form using Fourier Transforms.
C201.5	Formation of finite difference method in Z-transforms.
C202/STRENGTH OF MATERIALS	
C202.1	Understand the concept of deformation due to different loading conditions.
C202.2	Understand the fundamentals of various stresses and strains in the structural member.
C202.3	Construct the shear force and bending moment diagram for load transferring mechanism in different beams.
C202.4	Apply the basic equations to design the shaft and helical springs.
C202.5	Determine the slope and deflection in beams using different methods.
C202.6	Design thin and thick cylinders subjected to internal and external pressures
C203/ENGINEERING THERMODYNAMICS	
C203.1	Apply the basic concepts of thermodynamics for energy conversion phenomenon.
C203.2	Calculate thermal efficiency and coefficient of performance for heat engines, refrigerators and heat pumps.
C203.3	Evaluate the performance of steam power cycles.
C203.4	Derive simple thermodynamic relations of ideal and real gases.
C203.5	Calculate the properties of air vapor mixtures using psychrometrics
C203.6	Explain the performance of refrigeration systems and its environmental impacts.
C204/FLUID MECHANICS AND MACHINERY	
C204.1	Apply the concept of fluid properties with their effects on fluid flow.
C204.2	Apply the concepts of general energy equations in fluid flow problems.
C204.3	Calculate the major and minor losses in flow through pipes.
C204.4	Apply the mathematical knowledge in boundary layer concepts.
C204.5	Understand the working principle of pumps and turbines.

C204.6	Analyze the various performance characteristics of pumps and turbines.
C205 /MANUFACTURING TECHNOLOGY - I	
C205.1	Understand the fundamentals of casting, Welding, Forging and Sheet metal process
C205.2	Understand the basic concepts of Fusion and Non-Fusion Welding process
C205.3	Identify the different defects which occur in welding and casting process.
C205.4	Explain the various forming operations can performed in sheet metal process
C205.5	Compute the casting allowances and time taken for solidification in the process
C205.6	Understand the concepts of thermo and thermo setting plastics used in plastic manufacturing components
C206 /ELECTRICAL DRIVES AND CONTROLS	
C206.1	Select the rating and classes of duty of machines for particular application.
C206.2	Explain the mechanical and braking characteristics of dc and ac machines.
C206.3	Describe the starting methods of both dc and ac machines.
C206.4	Clarify conventional and solid state speed control of dc drives.
C206.5	Enlighten the speed control of dc and ac drive by conventional and solid state methods.
C206.6	Select the rating and classes of duty of machines for particular application.
C207/ MANUFACTURING TECHNOLOGY LABORATORY - I	
C207.1	Perform the taper turning operation in conventional lathe machine
C207.2	Perform the various thread operations for the given specification.
C207.3	Estimate the taper angle and machining time calculations in various machining operations.
C207.4	Perform the hexagonal bolts and square studs using shaper machine
C207.5	Calculate the eccentricity value to produce eccentric components
C207.6	Perform knurling operation to produce simple components in lathe.
C208 /FLUID MECHANICS AND MACHINERY LABORATORY	
C208.1	Recognize the minor losses in the pipes.
C208.2	Calculate the friction factor in pipes
C208.3	Determine the discharge coefficients for venture meter & Orifice meter
C208.4	Analyze the flow measurement by using flow measuring equipment
C208.5	Evaluate the performance of hydraulic turbines & pumps under different working conditions.
C208.6	Justify the fluid properties.

C209/ELECTRICAL ENGINEERING LABORATORY	
C209.1	Perform the load test, OCC, load characteristics and speed control of DC shunt and DC series motor
C209.2	Perform the load test, OC and SC test on a single phase transformer
C209.3	Examine the regulation of an alternator by EMF and MMF methods
C209.4	Conduct the load test, speed control on various phase of induction motor
C209.5	Explore the DC and AC starters
C210 /STATISTICS AND NUMERICAL METHODS	
C210.1	Define null and alternative hypothesis, Apply test statistic, level of significance and decision rule, Distinguish between Type I error and Type II errors to Explain the difference between one and two sided tailed of hypothesis.
C210.2	Explain the concept of analysis of variance to Distinguish between one and two factor analysis of variance tests.
C210.3	Solve Algebraic and Transcendental equations by various methods, Simultaneous linear equations using Direct and Indirect methods. Compute Eigen value of a matrix by power method.
C210.4	Interpret the data for Interpolation using various methods and compute the Numerical differentiation for Equal & Unequal intervals. Using Trapezoidal and Simpsons method for Numerical Integration solution.
C210.5	Solving first order differential equations using various types of single and multi step methods.
C210.6	Applying finite difference methods for solving II order differential equations.
C211/KINEMATICS OF MACHINERY	
C211.1	Understand the various kinematic concepts in different mechanisms.
C211.2	Analyze the velocity and acceleration of links at any point in various mechanisms.
C211.3	Construct the various cam profiles with follower motion.
C211.4	Solve the problems on gear and gear trains
C211.5	Recognize the effect of friction in different friction drives.
C211.6	Design the various motion transmission elements with their relative movements.

C212/MANUFACTURING TECHNOLOGY– II	
C212.1	Understand the constructional features of lathe and special machines
C212.2	Explain the various mechanism used in special machines
C212.3	Develop the part program in CNC milling and turning centers.
C212.4	Compute the tool nomenclature and tool life calculation in metal cutting process
C212.5	Select the suitable grinding wheels used in different grinding process
C212.6	Identify the suitable process to manufacture simple engineering components
C213 /ENGINEERING MATERIALS AND METALLURGY	
C213.1	Describe the various phase diagram for engineering metals
C213.2	Identify the different types of engineering materials in industrial applications
C213.3	Understand the various isothermal transformation in heat treatment process
C213.4	Understand the effects of alloying elements on Ferrous and Non-Ferrous materials.
C213.5	Discuss the properties and applications of Polymers, Ceramics and Composite materials
C213.6	Identify the mechanical properties and deformation using various mechanical testing methods.
C214 /ENVIRONMENTAL SCIENCE AND ENGINEERING	
C214.1	Realize the importance of ecosystems and the importance of biodiversity.
C214.2	Describe about Environmental pollution and their effects.
C214.3	Design the techniques which require optimum use of natural resources in future.
C214.4	Understand that Environmental Pollution / problems cannot be solved by mere laws.
C214.5	Explain importance of women and child education and HIV /AIDS.
C214.6	establish the social awareness and to recreate the polluted environment to a blissful and harmless environment to the human beings
C215 /THERMAL ENGINEERING	
C215.1	Calculate the efficiency of various gas power cycles.
C215.2	Compute the performance test on IC engines
C215.3	Estimate the concert of single and multi stage steam turbines
C215.4	Apply the thermodynamic concepts in various thermal systems.

C215.5	Calculate the properties of air vapor mixtures using psychrometrics
C215.6	Explain the importance of efficient energy utilization in engineering practices and its impact on the environment
C216 /MANUFACTURING TECHNOLOGY LABORATORY–II	
C216.1	Calculate the various cutting forces using tool dynamometers.
C216.2	Generate gears using gear hobbing machines
C216.3	Perform surface finish operations using surface grinding and cylindrical grinding machines.
C216.4	Develop CNC part programming for turning and milling operations
C216.5	Perform contour milling operation in various milling machine.
C216.6	Perform gear cutting operation using milling machine.
C217 /THERMAL ENGINEERING LABORATORY - I	
C217.1	Sketch the valve timing and port timing diagram for single cylinder four stroke diesel engines 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 and predict actual diagram
C217.4	Evaluate the performance of steam generator and steam turbines.
C217.5	Determine the flash and fire point of various fuels and lubricants
C217.6	Determine the fuel properties using redwood / saybolt viscometer
C218 /STRENGTH OF MATERIALS LABORATORY	
C218.1	Determine the elastic constants by using tensile and torsion test machine for mild steel (MS) specimen
C218.2	Conduct hardness test for different metals and carry out impact test for MS specimen
C218.3	Determine deflection in beams
C218.4	Identify modes of failure in components
C218.5	Determine safe working stresses for components
C218.6	Calculate the property of springs.
C301 /COMPUTER AIDED DESIGN	
C301.1	Understand the concept of 2D and 3D transformations and clipping algorithm.
C301.2	Understand the fundamentals of parametric curves, surfaces and Solids

C301.3	Apply the visual realism by using different algorithm
C301.4	Apply the mass property calculations on different parts
C301.5	Understand the different types of CAD Standards.
C301.6	Apply the various CAD algorithms in the area of product design and development.
C302 / HEAT AND MASS TRANSFER	
C302.1	Understand the basic laws of heat transfer in the engineering systems.
C302.2	Compute the temperature distribution in steady and unsteady state heat conduction.
C302.3	Evaluate the heat transfer coefficient for convection
C302.4	Calculate the phase change properties and the heat exchanger performance by varying the methods
C302.5	Calculate radiation heat transfer between black and gray body surfaces.
C302.6	Analyze the diffusion and convective mass transfer occurring in different applications
C303 /DESIGN OF MACHINE ELEMENTS	
C303.1	Understand the basic design parameters of various machine elements
C303.2	Understand the various stresses induce due to different loading conditions.
C303.3	Apply the basic design procedure to design the shafts, bearing and couplings.
C303.4	Apply the basic design steps to design the temporary and permanent joints.
C303.5	Design the various energy storing elements and engine components.
C303.6	Design the various machine members as per standard design catalogues.
C304 /METROLOGY AND MEASUREMENTS	
C304.1	Discuss the concepts of measurements in metrological instruments.
C304.2	Explain the principles of linear and angular measuring instruments for industrial applications.
C304.3	Understand the concepts of various computer aided inspection tools.
C304.4	Explain the different form measurements in industry.
C304.5	Understand the basic concepts of interchangeability and selective assembly.
C304.6	Understand the working principle of measuring equipments to measure intensive and extensive properties.
C305/DYNAMICS OF MACHINES	
C305.1	Understand the various force-motion relationships in different mechanisms
C305.2	Apply the principles of statics and dynamics to machinery

C305.3	Analyze the balancing masses in the rotating and reciprocating machines
C305.4	Solve the free vibration problems in longitudinal, transverse and torsional systems
C305.5	Apply the basic principles to reduce the undesirable effects of forced vibrations
C305.6	Apply the principles in mechanisms used for speed control and stability control
C306/PROFESSIONAL ETHICS IN ENGINEERING	
C306.1	Understand the core values that shape the ethical behavior of an engineer.
C306.2	Recognize the awareness on professional ethics with stress management.
C306.3	Understand the basic perception of various moral issues in ethical theories.
C306.4	Manipulate the various social issues in engineering field.
C306.5	Discover the professional responsibilities of an engineering safety issues.
C306.6	Solve the several of global issues by ethical principles.
C307 / DYNAMICS LABORATORY	
C307.1	Understand the concept of differential gear trains and kinematic links
C307.2	Evaluate the frequency of the vibrating system
C307.3	Analyze the controlling mechanisms
C307.4	Analyze the balancing masses in the rotating and reciprocating machines
C307.5	Determination of mass moment of inertia for different component
C307.6	Use the measuring devices for dynamic testing
C308 / THERMAL ENGINEERING LABORATORY-II	
C308.1	Conduct a test to find thermal conductivity of various engineering materials
C308.2	Measure the heat transfer rate in natural and forced convection environment
C308.3	Evaluate radiation heat transfer between black body surfaces and grey body surfaces
C308.4	Analyze the effectiveness of parallel and counter flow heat exchanger
C308.5	Compare the performance of theoretical and experimental refrigeration and air conditioning systems.
C308.6	Evaluate the performance of air compressors.
C309/ METROLOGY AND MEASUREMENTS LABORATORY	
C309.1	Ability to handle different measurement tools and perform measurements in quality impulsion
C309.2	Identify various gauges for measurement.
C309.3	Demonstrate linear and angular measurement using precision instruments.

C309.4	Apply the load cell to measure the force and torque
C309.5	Use thermocouple and comparator for taking measurement.
C309.6	Measure bore diameter using Bore gauge, telescope gauge and surface roughness using Surface Finish Measuring Equipment
C310 /DESIGN OF TRANSMISSION SYSTEMS	
C310.1	Select the materials for mechanical transmission system.
C310.2	Apply the design knowledge to design the various flexible drives.
C310.3	Apply the design concepts to design the parallel axis mating gear.
C310.4	Apply the basic design steps to design the perpendicular and oblique axis mating gear.
C310.5	Apply the design procedure to design the gear box.
C310.6	Apply the design principles to design the various friction drives.
C311/PRINCIPLES OF MANAGEMENT	
C311.1	Identifies the global context for taking managerial organization.
C311.2	Predict the global opportunity that will impact the management of an organization.
C311.3	Prepare the management principles into management practices.
C311.4	Analyze the managerial problem with ethical practice standards.
C311.5	Breakdown the managerial task executed in the variety of circumstances.
C311.6	Identify the most effective Action to take in the specific situation of addressing issues.
C312 /AUTOMOBILE ENGINEERING	
C312.1	Understand the automobile components and its function
C312.2	Understand the auxiliary systems
C312.3	Understand the vehicle structure
C312.4	Understand the recent trends in alternate fuels and automobile safety system.
C312.5	Understand the future developments in the automobile industry
C312.6	Understand the environmental implications of automobile emissions
C313/FINITE ELEMENT ANALYSIS	
C313.1	Solve Boundary value problems in structural and non-structural application.
C313 .2	Apply finite element methods in one dimensional Problem.
C313 .3	Solve dynamic problem by using finite element procedure.
C313 .4	Apply finite element technique in two dimensional scalar Problems.
C313 .5	Apply finite element method in two dimensional Vector problems.

C313 .6	Apply finite element procedure to solve problems on iso-parametric element
C314 /GAS DYNAMICS AND JET PROPULSION	
C314.1	Understand the one - dimensional steady compressible fluid flow
C314.2	Calculate the adiabatic and isentropic properties in various regions of flow
C314.3	Calculate the adiabatic and isentropic properties in various conditions of flows during friction and heat transfer
C314.4	Analyze the flow properties on shock waves in various flow regions
C314.5	Apply the gas dynamics principles in the jet and space propulsion
C314.6	Interpret the differences in Pressure, Temperature and Mach number in various regions of fluid flow
C315 / UNCONVENTIONAL MACHINING PROCESSES	
C315.1	Summarize the needs and classification of unconventional machining process.
C315.2	Understand the various input and output parameters that influence in the performance.
C315.3	Explain the working principle of energy based machining process.
C315.4	Compare the merits, demerits and applications of unconventional machining process
C315.5	Identify the electric discharge machining and wire cut electric discharge machining process.
C315.6	Select the material and tool with respect to the process.
C316 /C.A.D. / C.A.M. LABORATORY	
C316.1	Construct the machine drawing as per standards, Fits and Tolerances
C316.2	Identify proper computer graphics techniques for 2D drawing and 3D model.
C316.3	Develop the part model for any machine components by using modeling software.
C316.4	Develop the assembly model for machine components by using modeling software.
C316.5	Develop the program code for CNC machines for simulation
C316.1	Machine the components by using CNC machine
C317 /DESIGN AND FABRICATION PROJECT	
C317.1	Identify problems with their technical skills
C317.2	Design a product as per requirement
C317.3	Develop the detailed drawing for fabrication product with latest tool
C317.4	Create prototype of a working model
C317.5	Contribute effectively as an individual and as a member in a team

C317.6	Develop detailed report for new product
C318 / COMMUNICATION SKILLS - LABORATORY BASED	
C318.1	Take international examination such as IELTS and TOEFL
C318.2	Participate in Group Discussion.
C318.3	Successfully answer questions in Interviews.
C318.4	Make effective Presentations.
C318.5	Participate confidently and appropriately in conversations both formal and informal
C401/POWER PLANT ENGINEERING	
C401.1	Understand the layout and components of various power plants
C401.2	Understand different types of cycles and it's efficiencies in various power plants.
C401.3	Understand the sources and concepts of renewable energy
C401.4	Calculate the factors associated with power plant economics.
C401.5	Select the suitability of site for a power plant.
C401.6	Identify safety aspects of power plants
C402/MECHATRONICS	
C402.1	Explain mechatronics design process
C402.2	Choose sensors based on their working principle.
C402.3	Discuss the working of various actuators.
C402.4	Discuss the architecture of microprocessors and microcontroller.
C402.5	Explain the architecture of PLC and contrast it from PC and relay systems.
C402.6	Discuss the various case studies.
C403 /COMPUTER INTEGRATED MANUFACTURING SYSTEMS	
C403.1	Understand the basic concepts of CAD,CAM and Production systems
C403.2	Compute the production performance in different mathematical models.
C403.3	Explain the various aspects of planning and control systems in industry.
C403.4	Understand the concepts of part classification and coding system in cellular manufacturing.
C403.5	Describe the components of automated material handling and storage system.
C403.6	Explain the various robot configurations, motion and industrial applications.
C404 /TOTAL QUALITY MANAGEMENT	
C404.1	Describe the dimensional barrier regarding Quality.
C404.2	Summarize the Total quality principles.

C404.3	Demonstrate the tools utilization for quality improvement.
C404.4	Discover the new decision of principle in real time projects.
C404.5	Analyze the various types of techniques are used to measure quality.
C404.6	Apply the various quality systems in implementation of Total quality management.
C405 /PROCESS PLANNING AND COST ESTIMATION	
C404.1	Introduce the process planning concepts to make cost estimation for various products after process planning
C404.2	Identify the documents required for the process planning
C404.3	Calculate the material cost of a product.
C404.4	Explain the various associated in manufacturing shops.
C404.5	Calculate the machining time for various machining operations.
C404.6	Analyzing and approving subcontractor's capabilities and their quality plans.
C406/ROBOTICS	
C406.1	Evaluate the difference between various robot drives systems and grippers.
C406.2	Apply the basic concepts of industrial robots and their applications in industries.
C406.3	Summarize and compare various robot sensors with its perception principles.
C406.4	Explain the implementations of robots in industries.
C406.5	Identify the position of end effector and joint angles using Direct and Inverese kinematics.
C406.6	Recognize the responsibility of engineers for the safety issues.
C407 /SIMULATION AND ANALYSIS LABORATORY	
C407.1	Simulate the dynamic system by using MATlab software.
C407.2	Simulate the mechanism by using multi-body dynamic software
C407.3	Analyze the stresses for trusses and beams using analysis software
C407.4	Analyze the stresses for axi-symmetric components by using analysis software
C407.5	Analyze the response of vibrating system analysis software
C407.6	Analyze the Thermal stress and heat transfer analysis of plates and cylindrical shells analysis software
C408 / MECHATRONICS LABORATORY	
C408.1	Simulate Hydraulic, Pneumatic circuit using software tool.
C408.2	Simulate Electro pneumatic circuits using trainer kits.
C408.3	Design and test various fluid power circuits using software tool

C408.4	Interface stepper motor with 8051micro controller
C408.5	Conduct experiments using servo controller and stepper motor.
C408.6	Conduct experiments PID Controller interfacing
C409 / COMPREHENSION	
C409.1	Apply the knowledge in multi-disciplinary areas of Mechanical Engineering
C409.2	Solve all problems related to core subjects and concepts.
C409.3	Interpret on analytical problem solving methods.
C409.4	Obtain the concept of group dynamics and participative learning.
C409.5	Create or Design a solution for an innovative engineering problem.
C409.6	Obtain leadership qualities in turn may turn out into socially responsible personality.
C410/ ENGINEERING ECONOMICS	
C410.1	Apply the basic concepts of economics in the cost associated problems.
C410.2	Analyze make or buy decisions considering the value of the product in process control.
C410.3	Identify the time value of money based on the concept of value engineering.
C410.4	Apply the formulas of interest, Depreciation, Inflation calculations using cash flow diagrams in real time problems.
C410.5	Estimate the economic life of an asset for replacement or buying a new product.
C410.6	Evaluate economically the alternatives to select the best alternative.
C411 /ADVANCED I.C. ENGINES	
C411.1	Understand the various types of I.C. Engines and its Cycles of operation
C411.2	Understand the performance parameters in IC Engines
C411.3	Recognize the causes of emission
C411.4	Estimate the engines performance with alternative fuels
C411.5	Understand the environmental and social impact of IC Engines
C411.6	Understand the methods for reduction of exhaust emissions
C412 /PRODUCTION PLANNING AND CONTROL	
C402.1	Understand the production planning processes to convert the raw material into finished product.
C402.2	Prepare the production planning activities chart for work study to reduce the production time.
C402.3	Improve the market sale of existing product by changing the product planning

C402.4	Select the suitable process planning for manufacturing of a product.
C402.5	Analyze the production schedule for the given product.
C402.6	Analyze the inventory for a new product with help of latest software.
C413/PROJECT WORK	
C413.1	Identify real world problems of core engineering and related systems
C413.2	Formulate new set of problems
C413.3	Take on with industrial changes
C413.4	Evaluate to obtain solution for problems in mechanical engineering systems
C413.5	Adapt to work as a team for the successful completion of the project
C413.6	Document preparation and communication very clearly