

Course Outcomes (II Year) 2020-2021 I Sem		
CO.NO	COURSE OUTCOMES	Taxonomy
Specific learning outcomes – Complex Variables, Transforms and PDE (19A54301)		
C211.1	Find the analytic functions using C-R equations, the image using conformal mapping and bi-linear transformation.	Apply
C211.2	Use Cauchy's theorem, Cauchy's integral formula and Cauchy's residues theorem to evaluate complex integrations and expansion of complex functions using Taylor's and Laurent's series.	Apply
C211.3	Define Laplace and inverse Laplace transforms of various functions and solve ordinary differential equations using Laplace transform.	Apply
C211.4	Determine Fourier series of periodic functions in a given interval and Parseval's formula- Complex form of Fourier series.	Apply
C211.5	Construct the partial differential equations and solve first order and second order PDEs by Lagrange's method and method of separation of variables respectively	Apply
C211.6	Solve one dimensional wave, heat and Laplace equations.	Apply
Specific Learning Outcomes – Python Programming (19A05304T)		
C212.1	Interpret the basic concepts, modular approaches to solve the problems.	Understand
C212.2	Apply the concepts of conditional execution, recursion, built in functions, turtle to solve the problems	Apply
C212.3	Define and demonstrate the use of built-in String functions	Remember
C212.4	Apply python programs to read and write data from/to files.	Apply
C212.5	Summarize various data structures like Lists, Dictionaries, Tuples and its applications.	Understand
C212.6	Identify Python classes, objects, inheritance, goodies	Apply
Specific Learning Outcomes – Manufacturing Processes (19A03301T)		
C213.1	Differentiate various metal casting processes by understanding its defects and remedies.	Understand
C213.2	Describe the nature of various plastic deformation techniques used in hot and cold working of metals.	Understand
C213.3	Explain the different welding processes for defect free joints.	Understand
C213.4	Explain the steps involved in making of ceramics, processing of plastics.	Understand
C213.5	Describe the principle and steps involved in powder metallurgy.	Understand
C213.6	Demonstrate the principle and working of unconventional machining processes.	Understand
Specific Learning Outcomes – Engineering Mechanics (19A03302)		
C214.1	Analyze free body diagrams and concurrent and non concurrent forces at equilibrium condition.	Analyze
C214.2	Solve different types of friction problems.	Apply
C214.3	Analyze the perfect frames and concepts of virtual work	Analyze
C214.4	Determine the centroid, centre of gravity of composite figures and mass moment of inertia for solid bodies.	Apply
C214.5	Apply the principles of kinematics to rigid bodies.	Apply
C214.6	Apply the principles of kinetics to rigid bodies.	Apply
Specific Learning Outcomes – Material Science and Engineering (19A03303T)		
C215.1	Describe the physical metallurgy of metals	Understand

C215.2	Explain the Alloying and phase diagrams of metals.	Understand
C215.3	Explain Structure and properties of Ferrous and Non-ferrous metals	Understand
C215.4	Explain the methods to change the properties of materials through heat treatment processes	Understand
C215.5	Describe properties and applications of ceramics, polymers and composite materials.	Understand
C215.6	Explain the fundamental properties of Nano- materials and their applications.	Understand
Specific Learning Outcomes – Design Thinking & Product Innovation (19A99303T)		
C216.1	Summarize the importance of basic sciences in product development	Understand
C216.2	Explain the historical developments in mechanical, electrical, communications and computational engineering	Understand
C216.3	Apply systematic approach to innovative designs	Understand
C216.4	Identify new materials and manufacturing methods in design	Understand
C216.5	Develop simple electrical gadgets.	Understand
C216.6	Understand reverse engineering methods in product development.	Understand
Specific Learning Outcomes – Design Thinking & Product Innovation Lab (19A99303P)		
C217.1	Develop 3D models using 3D printing	Create
C217.2	Design the system with measuring devices	Apply
C217.3	Design hydraulic / pneumatic circuits	Apply
C217.4	Design and simulate hydraulic systems	Apply
C217.5	Apply electronic sensors for automation	Apply
C217.6	Design farm products.	Create
Specific Learning Outcomes – Manufacturing Processes Lab (19A03301P)		
C218.1	To calculate the pouring and solidification time during casting process.	Apply
C218.2	To illustrate the strength and permeability of sand used in moulding process.	Apply
C218.3	To produce defect free joints by applying TIG & MIG welding process.	Apply
C218.4	To produce defect free joints by applying special welding process.	Apply
C218.5	To model press working operations by using simple dies.	Apply
C218.6	To demonstrate the working principle of non-traditional manufacturing processes.	Understand
Specific Learning Outcomes – Material Science and Engineering Lab (19A03303P)		
C219.1	Identify the microstructures of Pure metals- Iron, copper and aluminium.	Apply
C219.2	Illustrate the microstructures of ferrous and non-ferrous metals and its alloys.	Apply
C219.3	Understand the Hardenability of steels by Jominy End Quench Test.	Apply
C219.4	Evaluate hardness of treated and untreated steels.	Apply
C219.5	Study of microstructure of ceramics, polymeric materials, super alloy and Nano-materials.	Apply
C219.6	Evaluate hardness of ceramics, super alloys, Nano-materials and polymeric materials	Apply
Specific Learning Outcomes – Universal Human Values (19A99302)		
C2110.1	Discuss the concept value-education in individual's life for happiness & prosperity	Understand

C2110.2	Explain the term self-exploration and its application for self-evaluation and development.	Understand
C2110.3	Discuss the importance of values in human relationships	Understand
C2110.4	Explain the holistic perception of harmony at level of self, family, society and nature.	Understand
C2110.5	Outline the co-existence of nature and human being	Analyze
C2110.6	Use professional ethics in their future profession for making a value-based society	Apply

Course Outcomes (III Year) 2020-2021 I Sem

CO.NO	COURSE OUTCOMES	Taxonomy
Specific learning outcomes – Fluid Mechanics & Hydraulic Machines (15A01510)		
C311.1	Describe the importance of various fluid properties which are at rest and in motion.	Understand
C311.2	Apply the governing equations to estimate flow quantities.	Apply
C311.3	Design the pipe line network based on frictional loss estimate.	Apply
C311.4	Explain the Hydroelectric Power plant with the available water resources and requirement of power.	Understand
C311.5	Evaluate the performance characteristics of hydraulic turbines.	Evaluate
C311.6	Evaluate the performance characteristics of Centrifugal Pumps.	Evaluate
Specific Learning Outcomes – Thermal Engineering-II (15A03501)		
C312.1	Quantify the performance of Rankine cycles and combined cycles based on thermodynamic analysis.	Apply
C312.2	strate the selection of boilers used in power plants.	Understand
C312.3	Design a chimney required for a power plant using systematic approach.	Apply
C312.4	Analyze the nozzles and condensers for different steam flow conditions. (Understand)	Understand
C312.5	Estimate the performance of steam turbines using flow velocity triangles.	Apply
C312.6	e the gas turbines based on cycles.	Analyse
Specific Learning Outcomes – Dynamics of Machinery (15A03502)		
C313.1	Explain the concepts of friction and its pivotal role in the functioning of collars, pivots, brakes, clutches and dynamometers.	Understand

C313.2	Apply gyroscopic principles on the motion of aeroplane, ship, four wheel and two wheel vehicles.	Apply
C313.3	Design a flywheel and also develop turning moment diagram for an IC engine.	Apply
C313.4	Describe the constructional and working characteristics of distinguished governors.	Understand
C313.5	Explain the means of balancing of rotating and reciprocating masses, in an IC engine, V-engine, multi cylinder engine and locomotives.	Understand
C313.6	Evaluate the response of a vibratory system instigated from either one or more of free, forced and damped vibrations with diverse nature.	Evaluate
Specific Learning Outcomes – Machine Tools (15A03503)		
C314.1	Interpret the tool geometry on chip formation and cutting processes.	Evaluate
C314.2	Identify the basic parts and operations performed on conventional machine tools.	Understand
C314.3	Estimate the machining parameters for machine tools.	Apply
C314.4	Select the type of machine tool and corresponding cutting tool required for a given geometry.	Understand
C314.5	Demonstrate the design features of jigs and fixtures.	Understand
C314.6	Use most advanced machine tools used in industrial automation.	Apply
Specific Learning Outcomes – Design of Machine Members – I (15A03504)		
C315.1	Design the machine elements using theories of failure.	Apply
C315.2	Design simple components under cyclic loading using Goodman's and Soderberg equation.	Apply
C315.3	Design riveted joints with different configuration, boiler shell joint design and eccentric loading design of riveted joints.	Apply
C315.4	Design bolted joints with direct loading and eccentric loading	Apply
C315.5	Design cotter joint, knuckle joint and shafts	Apply
C315.6	Design various types of keys, rigid and flexible shaft couplings.	Apply
Specific Learning Outcomes – Entrepreneurship (15A03505)		
C316.1	Explain the role and responsibilities of an entrepreneur in modern business scenario.	Understand
C316.2	Model and start the new venture.	Apply
C316.3	Prepare and implement the business plan.	Create
C316.4	Discuss the sources of finance and managing the venture.	Understand
C316.5	Demonstrate the new venture expansion strategies and issues.	Apply

C316.6	Discuss production and marketing aspects of entrepreneurship.	Understand
Specific Learning Outcomes – FM & HM Laboratory (15A01511)		
C317.1	Demonstrate the knowledge on various flow measuring instruments.	Apply
C317.2	Evaluate the coefficient of discharge of flow through pipes.	Evaluate
C317.3	Evaluate the major and minor losses for conduit flows.	Evaluate
C317.4	Analyze the performance characteristics of hydraulic turbines.	Analyze
C317.5	Analyze the performance characteristics of hydraulic pumps.	Analyze
C317.6	Analyze the percentage of error in discharge in flow through pipes.	Analyze
Specific Learning Outcomes – Machine Tools Laboratory (15A03508)		
C318.1	Explain the working of various parts of machine tools.	Evaluate
C318.2	Operate step turning, thread cutting and Knurling operations on lathe.	Apply
C318.3	Operate drilling and tapping operations using drilling machine.	Apply
C318.4	Operate keyway cut using Slotting Machines.	Apply
C318.5	Operate gear cutting using milling machine.	Apply
C318.6	Model the tool angles on single point cutting tool.	Apply
Specific Learning Outcomes – Audit course- Social Values & Ethics (15A99501)		
C319.1	Assess their own ethical values and social context of problems.	Evaluate
C319.2	Determine the professional ethics which includes moral issues and virtues, social responsibilities of an engineer, right, and qualities of Moral Leadership.	Apply
C319.3	Explain about philosophy of Life and Individual qualities.	Understand
C319.4	Identify the core values that shape the ethical behaviour of an engineer and to create awareness on Engineers responsibilities and rights.	Remember
C319.5	Describe appropriate technologies and management patterns to create harmony in professional and personal life.	Understand
C319.6	Explain their learning's about environment conservation, enrichment and Sustainability.	Understand

Course Outcomes (IV Year) 2020-2021 I Sem		
S.NO	COURSE OUTCOMES	Taxonomy
Specific learning outcomes – Management Science (15A52601)		
C411.1	Explain the basic concepts of management in modern contexts.	Understand
C411.2	Define organization structures and principles.	Understand
C411.3	Demonstrate production and marketing aspects.	Understand
C411.4	Outline the roles and responsibilities of Human Resource Manager.	Understand
C411.5	Formulate strategies in the modern management.	Apply
C411.6	Compare the modern management practices based on the requirement of the projects.	Understand
Specific Learning Outcomes – Automobile Engineering (15A03701)		
C412.1	Describe the functions of components in automobile.	Understand
C412.2	Demonstrate the working of transmission system use in automobile	Understand
C412.3	Explain the methods of steering system and their applications.	Understand
C412.4	Demonstrate the suspension systems in automobile.	Understand
C412.5	Summarize the functions of automobile breaking systems.	Understand
C412.6	Explain emission control techniques and electrical systems adopted in automobiles.	Understand
Specific Learning Outcomes – CAD/CAM (15A03702)		
C413.1	Describe the cycles in CAD, CAM and CAD/CAM systems which are used in the real time industry.	Understand
C413.2	Describe the tools used in Geometric modelling and various computer aided design considerations.	Understand
C413.3	Describe the NC tools, process held in the manufacturing units	Understand
C413.4	Demonstrate the Numerical Control programming in turning milling machines.	Understand
C413.5	Assess the quality of products using group technology technique.	Apply
C413.6	Describe the various process plans held in the industry and learning about MRP.	Understand
Specific Learning Outcomes – Metrology & Measurements (15A03703)		

C414.1	Explain the concept of limits, fits and jigs.	Understand
C414.2	Demonstrate the concept of measuring standard measurements using comparators. (Understand
C414.3	Demonstrate the measurement of surface profiles.	Understand
C414.4	Use the machine tool alignment test to prepare the acceptance charts.	Apply
C414.5	Calibrate the dynamic quantities using transducers.	Apply
C414.6	Calibrate the mechanical quantities using transducers.	Apply
Specific Learning Outcomes – Modern Manufacturing Methods (15A03706)		
C415.1	Understand the principles of a range of modern manufacturing technologies, apply subtractive and additive manufacturing for rapid prototyping.	Understand
C415.2	Describe the specific process characteristics of various modern manufacturing technologies and identify their possible applications and metal removal rate	Understand
C415.3	Students can able to know the fundamentals of electrochemical machining, its economical concepts and basics of chemical marching.	Understand
C415.4	Able to study the principles of EDM, EDG, PM, its applications	Understand
C415.5	Able to know the applications and limitations of Electron Beam machining and laser Beam Marching.	Understand
C415.6	Understand the fusion deposition modeling and solid ground curing	Understand
Specific Learning Outcomes – Automation and Robotics(15A03708)		
C416.1	Understand the importance of automation systems	Understand
C416.2	Explain about storage systems and flow lines	Understand
C416.3	Demonstrate working of robot components	Apply
C416.4	List the application of industrial robots	Remember
C416.5	Demonstrate the usage of robot accessories	Apply
C416.6	Analyze the dynamics characteristics of manipulator	Analyze
Specific Learning Outcomes – CAD/CAM Laboratory (15A03710)		
C417.1	Use CAD tools for 2D & 3D drawings of Mechanical Components.	Apply
C417.2	Show the 3D solid models into 2D drawing and orthographic views.	Apply
C417.3	Model the simple machine parts and assemble from part drawings using standard CAD packages.	Apply

C417.4	Describe the CNC control in modern manufacturing system.	Apply
C417.5	Describe CNC part programming and apply in manufacturing on CNC Turning machine.	Apply
C417.6	Demonstrate the NC Codes for CNC Machine.	Apply
Specific Learning Outcomes – Metrology & Measurements Laboratory (15A03711)		
C418.1	Demonstrate and measure the linear, angular and gear profiles.	Understand
C418.2	Conduct the alignment test on machine tools.	Apply
C418.3	Measure the flatness of the surface by using leveling tools.	Apply
C418.4	Measure the temperature & displacement by using transducers.	Apply
C418.5	Measure the speed, pressure, and strain by using transducers.	Apply
C418.6	Measure the angular measurement & flow measurement by using transducers.	Apply