COURSE OUTCOMES (COS)

Course Name: C211 Effective Technical Communication in English Year: II-I Sem A.Y: 2021-22

C211.1	Apply technical communication effectively
C211.2	Compile different types of professional correspondence
C211.3	Compose various techniques of report writing
C211.4	Acquire adequate skills of manual writing
C211.5	Enhance skills of information transfer and presentations

Course Name: C212 Finance and Accounting Year: II-I Sem A.Y: 2021-22

C212.1	Evaluate the financial performance of the business unit.
C212.2	Analyze decisions on selection of projects.
C212.3	Take decisions on procurement of finances.
C212.4	Analyze the liquidity, solvency and profitability of the business unit.
C212.5	Evaluate the overall financial functioning of an enterprise.

Course Name: C213 Mathematics-III Year: II-I Sem A.Y: 2021-22

C213.1	Solve field problems in engineering involving first order PDEs.
C213.2	Solve field problems in engineering involving higher order PDEs.
C213.3	Apply the concepts of probability, distributions and moments, kurtosis and skewness in different fields
C213.4	Determine the coefficient of correlation, regression and obtain the knowledge of sampling theory with context to test of hypothesis.
C213.5	Analyze and check the validity of statement using testing of hypothesis for various parameters and goodness of fit.

Course Name: C214 Engineering Mechanics-I Year: II-I Sem A.Y: 2021-22

C214.1	Apply the fundamental concepts of stress and strain in the analysis and design of axially loaded members.
C214.2	Analyze determinate beams to determine shear forces, bending moments and determine the bending stress distribution in beams.
C214.3	Determine the shear stress distribution in a beam and also the stresses in beams subjected to combined axial and bending loads.
C214.4	Evaluate the stresses and strains of circular members subjected to torsion and calculate the power required for torsional revolutions of shafts
C214.5	Analyze the combined stresses at a point to evaluate principal stresses, and their applications in evaluating failure criteria in various materials and pressure vessels
C214.6	Evaluate the stresses of circular members subjected to torsion and analyze different types of springs.

C215.1	Obtain the V-I characteristics of diode and analyze various diode applications like rectifiers and regulators.
C215.2	Analyze the construction & working of active devices like BJT & FET in various modes.
C215.3	Recognize the type of feedback and analyze its effect on amplifier characteristics and calculate the frequency of oscillation for different types of oscillator circuits.
C215.4	Analyze and design different circuits using Ideal Op Amps; Design simple digital circuits using logic gates.
C215.5	Analyze different data acquisition systems and data converters.

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COURSE OUTCOMES (COS)

Course Name: C311 Fluid Mechanics and Hydraulic Machinery Year: III-I Sem A.Y: 2021-22

C311.1	Distinguish the properties of fluids along with pressure measurement techniques.
C311.2	Identify different types of fluid flow patterns and analyze the continuity equation for one and three dimensional differential forms.
C311.3	Apply fundamental laws of fluid mechanics and Bernoulli's principle to analyze the practical applications.
C311.4	Analyze the flow between parallel plates and circular tubes, and determine the major and minor losses in different pipes and drag - lift coefficients.
C311.5	Evaluate the performance characteristics of hydraulic turbines.
C311.6	Evaluate the performance characteristics of a given Centrifugal and Reciprocating pumps.

Course Name: C312 Design of Machine Elements Year: III-I Sem A.Y: 2021-22

C312.1	Understand fundamentals of design of machine elements, and behavior of members subjected to various types of complex loads, and criteria of failure to satisfy the applications.
C312.2	Understand the Principles involved in evaluating the shape and dimensions of a component, when subjected to various types of fatigue loading, and methods to reduce the stress concentration.
C312.3	Design the machine components joined by Riveted, Welded and bolted joints, and to analyze the different ways in which riveted and welded joints can fail.
C312.4	Demonstrate the design, development and use of knuckle joint, spigot cotter joint, gib and cotter joint, strap end of a connecting rod and use of different keyways in engineering applications.
C312.5	Design the shafts composed of gears and belt pulley.
C312.6	Map out and design the different Couplings used in different industrial applications.

Course Name: C313 Dynamics of Machines Year: III-I Sem A.Y: 2021-22

C313.1	Analyze the gyroscopic effect on aero-plane, ships, two-wheeler vehicles & four-wheeler vehicles, and the static & dynamic force analyses of planar mechanisms.
C313.2	Construct the turning moment diagram for IC engines, and analyze the engine forces, and flywheel.
C313.3	Analyze the power loss in bearing due to friction, power transmitted by clutch, and operation of dynamometers.
C313.4	Understand the function of governors to analyze sensitiveness, stability of the governor.
C313.5	Evaluate the frequency of vibration to determine the critical speed of the shaft.
C313.6	Balance rotating & reciprocating masses.

Course Name: C314 Metal Cutting and Machine Tools Year: III-I Sem A.Y: 2021-22

C314.1	Analyze the cutting tool geometry, mechanism of chip removal and orthogonal cutting mechanics.
C314.2	Understand the thermal aspects of metal cutting, analyze the influence of tool wearon tool life and machinability.
C314.3	Identify the basic part and operation of machine tools and apply indexing methods for machining.
C314.4	Understand various finishing and super finishing operations, screws and gear manufacturing processes.
C314.5	Apply principles for location and clamping of jigs and fixtures and its applications.
C314.6	Understand the various unconventional machining processes and their applications.

Course Name: C315 Heat Transfer Year: III-I Sem A.Y: 2021-22

C315.1	Analyze the different modes of HT, derivations related to cylindrical, spherical and Cartesian coordinates.
C315.2	Evaluate the 1-D steady state conduction , overall heat transfer coefficient andcritical radius of insulation
C315.3	Analyze the differences between forced convection and natural convection
C315.4	Evaluate the different classifications of boiling and condensation and also ofradiation heat transfer, heat exchangers and its classification
C315.5	Analyze practical applications of heat transfer and its importance in the field of mechanical engineering in practical life

Course Name: C316 Thermal Engineering Lab-2 Year: III-I Sem A.Y: 2021-22

C316.1	Calculate thermal conductivity of solids, heat transfer coefficient subjected to natural and forced convection environment, emissivity and Stefan Boltzmann constant value of thermal radiation
C316.2	Predicting efficiency of Pin-fin subject to natural and forced convection and LMTD and effectiveness of parallel and counter flow heat exchangers
C316.3	Interpret the link between refrigeration effects, work done and COP of the system Refrigeration and Air conditioning systems
C316.4	Identify the different Psychometric processes on Psychometric chart and describe how those processes can be maintained
C316.5	Determine overall efficiency of Centrifugal blower and Axial fan
C316.6	Measurement of pressure distribution, lift and drag force on specimen in Wind Tunnel

Course Name: C317 Dynamics of Machines Lab Year: III-I Sem A.Y: 2021-22

C317.1	Understand the working of governors to perform Experiments on Performance Characteristics Curves.
C317.2	Analyze the effect of gyroscopic couples for different motions.
C317.3	Balance masses statistically and dynamically.
C317.4	Predict the motion of the follower for given profile of cam.
C317.5	Determine the time period, amplitude and natural frequency of the vibrating system.
C317.6	Determine the critical speed of the shaft for different ri-conditions.

Course Name: C318 Fluid Mechanics and Hydraulic Machinery Lab Year: III-I Sem A.Y: 2021-22

C318.1	Investigate through experimentation different types of pump models and estimate their performance under different working conditions.
C318.2	Determine the coefficient of impact of jet on vanes at different flow rates.
C318.3	Estimate the performance of hydraulic turbines at constant speed and constant head.
C318.4	Calibrate flow measuring devices such as venturi meter and orifice meter
C318.5	Develop the hydraulic circuits to cater the needs of the industry.

Course Name: C216 Metallurgy and Material Science Year: II-I Sem A.Y: 2021-22

C216.1	Understand the concept of different crystal structures along with its defects and mechanical properties of materials.
C216.2	Understand fracture mechanics and develop fatigue curve.
C216.3	Construct iron-iron carbide phase diagram and interpret different types of steels.
C216.4	Analyze different heat treatment processes.
C216.5	Explain the concept of non-ferrous alloys and their properties.
C216.6	Summarize the structure and composition of ceramics, polymers and composites.

Course Name: C217 Thermo dynamics Year: II-I Sem A.Y: 2021-22

C217.1	Understand the basic concepts of thermodynamics system, properties, equilibrium, pressure, specific volume, temperature, quasi static processes and apply for solving thermodynamic problems.
C217.2	Understand the zeroth law of thermodynamics and apply for temperature measurement, temperature scales and ideal gas equations.
C217.3	Apply the first law of thermodynamics for closed and open systems undergoing different thermodynamic processes.
C217.4	Apply the second law of thermodynamics for refrigerators, heat engines, heat pumps, compressors and nozzles.
C217.5	Describe the properties of pure substances, gases and their mixtures, and apply the property relations to thermodynamic problems.
C217.6	Analyze the Power Cycle, Vapour Cycles and Refrigeration Cycle

Course Name: C218 Metallurgy and Material Testing Lab Year: III-I Sem A.Y: 2021-22

C218.1	Study of Metallurgical Microscope, Iron-Iron Carbide diagram, Procedure for specimen preparation
C218.2	Prepare and study microstructure of low carbon steel, medium carbon steel, high carbon steel
C218.3	Prepare and study microstructure of copper, Brass and Bronze
C218.4	Prepare and study microstructure of cast iron.
C218.5	Prepare and study microstructure of white cast iron,
C218.6	Test the hardenability on Jominy End quench Test

Course Name: C219 Machine Drawing and Modeling Lab Year: II-I Sem A.Y: 2021-22

C219.1	Understanding and suitable application of dimensioning, drawing sheet format, angleof projection, type of projection such as orthogonal, isometric, etc., & sectional views.
C219.2	Make free hand sketches of various mechanical components.
C219.3	Obtain the knowledge of conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs etc.
C219.4	Understand and evaluate different types of joints such as cotter joints, riveted joints, welded joints & amp; couplings and make their drawings.
C219.5	Extract data from the drawing such as type of projection (first angle / second angle, etc.,), type of view (front / top / side), dimensions, etc., and utilize them for conversion from isometric to orthographic & amp; vice versa and from part drawing to assembly drawing & amp; vice versa.
C219.6	Evaluate and develop assembly drawings using part drawings and to analyze the functions of different parts in assembly, in future machine drawing standards can be used for safe design of assemblies.

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COURSE OUTCOMES (COS)

Course Name: C411 Refrigeration & Air Conditioning Year: IV-I Sem A.Y: 2021-22

C411.1	Acquire knowledge about different methods of Refrigeration and about Air Conditioning
C411.2	Gain knowledge and comprehension about Bell Coleman cycle in Air Refrigeration systems, Joule Cycle used in vapour compression refrigeration system and vapour absorption refrigeration system, Steam Jet Refrigeration system, Thermoelectric refrigerator, Vortex tube or Hilsch tube.
C411.3	Distinguish between gas power cycles and Vapour cycles and related to refrigeration systems, components of refrigeration system and Refrigerants used in the systems.
C411.4	Interpret and apply tables and charts for solving problems related to design of refrigeration system and air conditioning.
C411.5	Comprehend and design major components and complete refrigeration and Air Conditioning systems.

Course Name: C412 Additive Manufacturing Year: IV-I Sem A.Y: 2021-22

C412.1	Interpret the prototyping fundamentals and RP Processes.
C412.2	Recognize liquid and solid based RP Systems.
C412.3	Recognize different types of Powder based RP System and Rapid Tooling.
C412.4	Identify STL formats, STL files and its problem.
C412.5	Describe the differences and applications of AMT.
C412.6	Explain and summarize typical rapid tooling processes for quick batch production of plastic and metal parts.

Course Name: C413 Power Plant Engineering Year: IV-I Sem A.Y: 2021-22

C413.1	Understand the sources of energy , layout , working of different circuits
C413.2	Discuss the types, construction and plant layout with auxiliaries.
C413.3	Classify and principles of working of closed and open cycle gas turbines.
C413.4	Classify the hydroelectric power plant, dams and spillways.
C413.5	Analyze the different forms of non-conventional energy sources
C413.6	Determine the effluents from the power plants and input on environment pollutions.

Course Name: C414 Fluid Power Systems **Year: IV-I Sem A.Y: 2021-22**

C414.1	Analyze the basic concepts of fluid power system, properties of fluids, Fluids for hydraulic systems, characteristics of curves of pumps, ISO symbols for hydraulic systems.
C414.2	Analyze types of actuators and valves, concept of series and parallel pressure compensation flow control valve, design and analysis of flapper valve.
C414.3	Design and analysis of typical hydraulic circuits. Regenerative circuits, high low circuits, Synchronization circuits, and accumulator sizing.
C414.4	Analyze the Components of pneumatic systems, Direction, flow and pressure control valves in pneumatic systems, Development of single and multiple actuator circuits.
C414.5	Evaluate typical circuits of hydraulics.
C414.6	Evaluate typical circuits of Pneumatics.

Course Name: C415 Utilization of Electrical Energy **Year: IV-I Sem A.Y: 2021-22**

C415.1	Acquire knowledge on, electric drives characteristics and their applicability inindustry based on the nature of different types of loads and their characteristic
C415.2	Understands the concepts and methods of electric heating, welding, illumination and electric traction
C415.3	Apply the concepts to real-world electrical and electronics problems and applications
C415.4	Design and Calculations of tractive effort, power, specific energy
C415.5	Apply Knowledge for System of electric traction and track electrification
C415.6	Apply Speed-time curves for different services

Course Name: C416 Industrial oriented mini–Project **Year: IV-I Sem A.Y: 2021-22**

C416.1	Use knowledge within the chosen area of technology for project development.
C416.2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
C416.3	Reproduce, improve and refine technical aspects for engineering projects.
C416.4	Work as an individual or in a team in development of technical projects.
C416.5	Communicate and report effectively project related activities and findings.

Course Name: C417 Seminar **Year: IV-I Sem A.Y: 2021-22**

C417.1	Engaged in the integral activities of reading, discussion and composition around a particular topic.
C417.2	Develop presentation skills.
C417.3	Apply confidence to face the interviews.
C417.4	Investigate the advancements in the particular topic.
C417.5	Distinguish opinions from researched claims.

Course Name: C418 Project Phase- I **Year: IV-I Sem A.Y: 2021-22**

C418.1	Identify a topic in advanced areas of Mechanical Engineering.
C418.2	Analyze and discuss the results to draw valid conclusions.
C418.3	Review literature to identify gaps and define objectives & scope of the work.
C418.4	Generate and implement innovative ideas for social benefit.
C418.5	Discuss complete process of a project – designing, programming, module development.