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3rd Semester Subjects

Subject: Advanced Engineering Mathematics-I **Code**: 3ME2-01

CO-1	To use the numerical methods for Interpolation, numerical differentiations, Integration , Ordinary differential equations and Polynomial
CO-2	To define Laplace Transform and apply it to solve Ordinary differential equations
CO-3	To understand the concept of Fourier Transform and apply it to solve one dimensional heat and wave equation
CO-4	To apply the Z-Transform techniques on difference equation

Subject: Managerial Economics and Financial Accounting **Code**: 3ME1-03

CO-1	To understand the basic concepts of economics
CO-2	To understand the relation between demand and supply
CO-3	To learn the concepts of production and cost analysis
CO-4	To understand financial statement analysis

Subject: Engineering Mechanics **Code**: 3ME3-04

CO-1	To describe fundamental laws of forces, FBD, Trusses and virtual work.
CO-2	To identify problem associated with Centre of gravity and Moment of Inertia and lifting machines.
CO-3	To understand the basic concept of Friction with belt and rope drive.
CO-4	To Understand the Kinematics, Dynamics and Vibration.

Subject: Engineering Thermodynamics **Code**: 3ME4-05

CO-1	To state the basic concept and law of Engineering Thermodynamics.
CO-2	To calculate the properties of substance by using property tables, thermodynamics relationship.
CO-3	To illustrate the Thermodynamics Cycles.

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Subject: Material Science and Engineering **Code**: 3ME4-06

CO-1	To enumerate the basic understanding of atomic structure, bonding and crystal structure
CO-2	To classify the different type of materials with their mechanical properties and strengthening mechanism
CO-3	To explain the concept of phase diagram, phase transformation and thermal processing of metal alloys.
CO-4	To Impart the knowledge of various nonmetal martials such as polymers, composites their application and processing.

Subject: Mechanics Of Solids **Code**: 3ME4-07

CO-1	To classify stress /strain in structural members subjected to different types loading condition.
CO-2	To construct SF & BM for various types of loads/beams.
CO-3	To solve problems on torsion member ,structural member and pressure vessels

Subject: Machine drawing practice **Code**: 3ME4-21

CO-1	To recall basics of engineering drawing and apply the concepts on various connections of machine parts and assembly.
CO-2	To Make 2D/3D model of different mechanical parts using different CADD software

Subject: Materials Testing Lab **Code**: 3ME4-22

CO-1	To determine strength, hardness of various materials by testing
CO-2	To identify crystal structure of various materials, examine microstructures and improve material properties by using appropriate heat treatment process

Subject: Basic Mechanical Engineering Lab **Code**: 3ME4-23

CO-1	To analyze the mechanism of bicycle, sewing machine
CO-2	To compare the working of pump, engine and air conditioners

Subject: Programming using MATLAB **Code**: 3ME4-24

CO-1	To become familiar with fundamental operations in MATLAB

CO-2	To perform statistical data analysis, data interpolation by MATLAB, solve differentiation equation with MATLAB

Subject: Industrial Training **Code**: 3ME7-30

CO-1	To provide comprehensive learning platform to students where they can enhance their employ ability skills and become job ready along with real corporate exposure.
CO-2	To provide learners hands on practice within a real job situation.

4th Semester Subjects

Subject: Data analytics **Code**: 4ME2-01

CO-1	To discuss the process of Multivariate Analysis by identifying missing data, outliers, normality and homoscedasticity.
CO-2	To describe various Multivariate techniques appropriately and draw appropriate conclusions.

Subject: Technical Communications **Code**: 4ME1-02

CO-1	To express themselves better in technical writing by understanding the concept style and methodology used in technical communication
CO-2	To pursue higher studies by working on all aspects English Language and also develop a better understanding of process and design of technical texts
CO-3	To get an in depth knowledge of technical communication used in professional life by getting to know all the forms and aspect of technical communication.

Subject: Digital Electronics **Code**: 4ME3-04

CO-1	To understand the semiconductor devices and its application.
CO-2	To understand the op-amp characteristics and its applications.
CO-3	To design the various combinational & sequential circuits using Boolean algebra.
CO-4	To understand the real time communication system.

Subject: Fluid Mechanics and Fluid Machines **Code**: 4ME4-05

CO-1	To describe fundamental concepts of Fluid Mechanics.
CO-2	To apply Fluid flow concepts for pipe flow.

CO-3	To determine the appropriate units and predict formulas.
CO-4	To estimate the efficiency of various Hydraulic Turbines, pumps and other hydraulic system.

Subject: Manufacturing Processes **Code**: 4ME4-06

CO-1	To describe various type of casting processes.
CO-2	To memorize different forming & joining processes in manufacturing.
CO-3	To explain additive manufacturing process.
CO-4	To classify plastic & Nano technologies in manufacturing and their relevance to industry.

Subject: Theory of machines **Code**: 4ME4-07

CO-1	To Determine velocity and acceleration of various planar mechanisms using the concept of link, pair, and mechanism.
CO-2	To Demonstrate the working of clutches and brakes.
CO-3	To Identify different type of gears and gear trains.
CO-4	To Apply the concept of gyroscope, cams, and cam followers in machines.
CO-5	To Explain the effect of disturbing mass on higher speed of automobiles.

Subject: Digital Electronics lab **Code**: 4ME3-21

CO-1	To Evaluate truth table of basic gates
CO-2	To Analyze and design various combinational circuits
CO-3	To Analyze and design various sequential circuits

Subject: Fluid Mechanics lab **Code**: 4ME4-22

CO-1	To apply Basic fluid mechanics principle in practical application.
CO-2	To study flow characteristics, measure flow rates and related parameters.

Subject: Production practice lab **Code**: 4ME4-23

CO-1	To recognize about various machining processes and effect of machining parameters on quality of work piece.

CO-2	To prepare tools and jobs by developing a manufacturing-centric knowledge.

Subject: Theory of machines Lab **Code**: 4ME4-24

CO-1	To express a good understanding of the principles of mechanisms and machines, and their practical applications in Mechanical Engineering.
CO-2	To apply the concepts of power transmission by the application of friction.
CO-3	To balance the wheel of automobiles.

5th Semester Subjects

Subject:HEAT TRANSFER **Code**: 5ME1A

CO-1	To calculate conductive heat transfer rate
CO-2	To analyze the basic concept of convection and vaporization phenomena
CO-3	To choose appropriate heat exchanger according to application
CO-4	To discuss the concept of radiation and impact of energy systems on the global environment.

Subject: DYNAMICS OF MACHINES **Code**: 5ME2A

CO-1	To explain the basics of Mechatronics and to relate Mechanical Engineering with Electronics Engineering.
CO-2	To analyze fabrication and designing of MEMS.
CO-3	To examine real time systems and to learn Data Acquisition and their related system.
CO-4	To design mechatronics system for day to day life and for industrial purpose

Subject: Measurement & Metrology **Code**: 5ME3A

CO-1	To classify the basic concept of measurement and calibration.
CO-2	To identify different measuring instruments for different application.
CO-3	To explain working principle of advanced measuring devices for precise measurement.
CO-4	To select appropriate method and instrument for inspection of different geometrical parameters of a component.

CO-5	To define tolerance and fits for selected product quality.

Subject: Quality Assurance & Reliability **Code**: 5ME4A

CO-1	To discuss the various aspects of quality
CO-2	To maximize the basic concept of applied statics
CO-3	To practice of statistical quality control tools
CO-4	To illustrate the quality assurances concept
CO-5	To explain the concept of reliability and quality loss function.

Subject: Sociology and Economics for Engineers **Code**: 5ME5A

CO-1	To identify various sociological concepts and apply them for different social issues.
CO-2	To explain Monetary and Financial/Fiscal Policy and system.
CO-3	To recognize and comprehend contemporary socio-economic issues in India.

Subject: Automobile Engineering **Code**: 5ME6.2

CO-1	To interpret the function, constructional features of chassis and working of clutches and brakes.
CO-2	To describe the working of transmission system with their necessity and application
CO-3	To analyze tyre, steering system and geometry with utility of suspension system.
CO-4	To identify automotive electrical system, ignition system and requirement of automotive lighting , air conditioning and safety

Subject:HEAT TRANSFER LAB **Code**: 5ME7A

CO-1	To analyze the conduction and convection processes that occurs in multiple aspects of daily life.
CO-2	To examine the process of radiation and relate its properties to design of thermal systems.

Subject: Dynamics of Machines LAB **Code**: 5ME8A

CO-1	To analyze the principles of mechanisms and machines, and their practical applications in Mechanical Engineering.
CO-2	To determine the functions different mechanisms of an automobiles.

Subject:PRODUCTION ENGINEERING LAB. **Code**: 5ME9A

CO-1	To analyze the basic measurement units and able to calibrate various measuring devices.
CO-2	To determine error and correction factors of various measuring devices.

Subject: Professional Ethics and Disaster Management **Code**: 5ME10A

CO-1	To implement professional ethics and human values in practical scenario.
CO-2	To integrate the situation of natural and manmade disaster and to identify how to manage disaster.

6th Semester Subjects

Subject: Design of Machine Elements - II **Code**: 6ME1A

CO-1	To determine the finite and infinite life of mechanical components due to fluctuating loads
CO-2	To analyse the various automobile parts under different service conditions
CO-3	To design the different types of gears due to gear forces
CO-4	To identify the different types of bearing under various loads

Subject: Newer Machining Methods **Code**: 6ME2A

CO-1	To identify the best machining process for machining of particular material among the conventional and unconventional machining process.
CO-2	To describe the mechanism of metal removal of various unconventional machining processes.

CO-3	To explain the effect of unconventional machining condition on MRR and surface roughness.
CO-4	To categories Nano and micromachining processes and their industrial applications.

Subject: Mechatronics **Code**: 6ME3A

CO-1	To explain the basics of Mechatronics and to relate Mechanical Engineering with Electronics Engineering
CO-2	To learn about sensors and actuators. To analyze and design fabrication and designing of MEMS
CO-3	To design mechatronics system for day to day life and for industrial purpose.

Subject: Vibration Engineering **Code**: 6ME4A

CO-1	To explain the propagation of sound, noise sources and need of vibration analysis machine parts.
CO-2	To formulate mathematical models of problems in vibrations
CO-3	To determine vibratory responses of single and multi-degree of freedom system
CO-4	To analyze the parameters of vibration isolation system

Subject: Steam Engineering **Code**: 6ME5A

CO-1	To identify components of boilers and their role in the efficiency and safely operation of the boilers.
CO-2	To analyze the performance of nozzles and turbines by applying concepts and laws of thermodynamics and fluid mechanics.
CO-3	To explain the working of rankine cycle and its efficiency improvement methods.

Subject: Maintenance Management **Code**: 6ME6.3A

CO-1	TO relate the role of maintenance in environment conservation challenges/issues.
CO-2	TO develop and implement an effective maintenance strategy considering different factors including tribological aspect.
CO-3	To discriminate and apply different condition monitoring techniques and related Instruments.
CO-4	To develop the relationship of key concepts in reliability, availability and maintainability, and application to deciding suitable maintenance strategies in a manufacturing environment

Subject: Machine Design Sessional -II **Code**: 6ME7A

CO-1	To analyse an existing problem or by modifying design to certain given specifications for mechanical elements
CO-2	To categorize the separate and distinct phases that define the decision making process as applied to machine Design

Subject: Industrial Engineering Lab-I **Code**: 6ME8A

CO-1	To implement various concepts involved in statistical process controlas an Industrial Engineer in industry
CO-2	To understand and verify probability distributions and solve the problems using statistical process control software in lab.

Subject: Mechatronics Lab **Code**: 6ME9A

CO-1	To apply knowledge of instruments for effective use & identify various transducers for measurement of strain, temperature, displacement.
CO-2	To Understanding of mobile robot through programming
CO-3	To apply knowledge of PLC programming using Logic gates ,Timers & counters, Traffic light
CO-4	To understanding of MATLAB programming

Subject: Vibration Engineering Lab **Code**: 6ME10A

CO-1	To determine the natural frequency of vibration problems that contain single and multi-degree of freedom systems.
CO-2	To calculate the damping coefficient of single and multi-degree of freedom systems.

7th Semester Subjects

Subject: Finite Element Methods **Code**: 7ME1A

CO-1	To interpret the philosophy behind principles, design and modeling considerations in using finite element analysis.
CO-2	To apply the concept of direct equilibrium method and potential energy method for structural mechanics problems
CO-3	To Analyze1-D Heat transfer, Solid mechanics, fluid Mechanics problems using different integration and vibrational formulation.

Subject: Refrigeration And Air Conditioning **Code**: 7ME2A

CO-1	To apply the fundamentals of sciences and engineering for understanding the working of different types of refrigeration systems.
CO-2	To analyze the effect of different refrigeration conditions on the performance of refrigerator and environment.
CO-3	To identify best refrigeration system and component of refrigeration system according to need of customers.
CO-4	To design air condition unit according to the specific need of customers.

Subject: Operations Research **Code**: 7ME3A

CO-1	TO Formulate the linear problems of real world and obtain their optimal solutions with certain techniques.
CO-2	TO Make policy and implementation for replacement of items that deteriorate under consideration of various factors.
CO-3	TO Solve the problems of waiting line and understand the theory of decisions.
CO-4	TO Understand Inventory Process and Simulation & its applications to solve certain problems of industry.

Subject: Turbomachines **Code**: 7ME4A

CO-1	To explain the working principles of turbo machines and apply it to various types of machine.
CO-2	To calculate work done and efficiency of turbo machines operating at design and off design conditions
CO-3	To apply working principle of various type of gas turbine and know their application range.
CO-4	To identify different type of turbines.

Subject: Operations Management **Code**: 7ME5A

CO-1	To describe the basic concepts of operations management and production systems
CO-2	To analyze and solve the problems of production planning, scheduling & control
CO-3	To understand the concepts of MRP, JIT and SCM
CO-4	To Solve the problems using project management & reliability.

Subject: Micro and Nano Manufacturing **Code**: 7ME6.1A

CO-1	To identify the different techniques used in micro and nano manufacturing.
CO-2	To tell about non-conventional micro-Nano manufacturing and finishing approaches.
CO-3	To understand techniques and other processing routes in micro and Nano manufacturing.
CO-4	To summarize techniques used in micro joining and the metrology tools in micro and Nano manufacturing.

Subject: Thermal Engineering Lab-II **Code**: 7ME7A

CO-1	To analyze the performance measures of thermal systems.
CO-2	To calculate performance characteristics of turbo machines.

Subject: Finite Element METHOD Lab. **Code**: 7ME8A

CO-1	To Implement and conduct the finite element analysis on different types of engineering problem i.e. structural, Thermal, Buckling and frequency analysis using FEA packages
CO-2	To propose the safe design limits for engineering problems through the analysis of real-world problems.

Subject: Practical Training & Industrial Visit **Code**: 7METR

CO-1	To Co-relate the concepts learnt in classrooms to industrial application.
CO-2	To identify sources of hazards, and assess/identify appropriate health & safety measures.
CO-3	To attain thoughts and views into technical presentation form.

Subject: Project-1 **Code**: 7MEPR

CO-1	To identify the given problem and acquire the system integration skills.
CO-2	To prepare handle project with overall safety concern.
CO-3	To relate the documentation and communication skills.
CO-4	To analyze and integrate the project with managerial skills.

8th Semester Subjects

Subject: Computer Integrated Manufacturing Systems **Code**: 8ME1A

CO-1	To identify the main elements in Computer Integrated Manufacturing Systems.
CO-2	To apply the knowledge of Computer Aided Process Planning (CAPP), features, Group Technology and data exchange in Manufacturing Processes.
CO-3	To analyze the process product models with CAM tools and CNC machines with Collaborative Engineering

Subject: Laws for Engineers **Code**: 8ME2A

CO-1	To recognize of their rights and also aware that to settle disputes in industry with leads to better human relation.
CO-2	To identify various acts set by GOI, this will make them aware and conscious regarding the consequences in case of laws violation and punishment to be mattered.
CO-3	To discuss about the election provision in India.

Subject: Power Generation **Code**: 8ME3A

CO-1	To explain the fundamental concepts of electricity generation
CO-2	To analyse the steam power plant with different conditions.
CO-3	To compare the function of hydroelectric ,diesel and gas power plant
CO-4	To identify the basic renewable energy resources and implement them in electricity generation

Subject: Product Development and Launching **Code**: 8ME4.1A

CO-1	To explain the fundamental concepts of electricity generation
CO-2	To analyze the steam power plant with different conditions
CO-3	To compare the function of hydroelectric ,diesel and gas power plant
CO-4	To identify the basic renewable energy resources and implement them in electricity generation

Subject: CAM Lab **Code**: 8ME5A

CO-1	To prepare program and execute it on Computer Numerical Control (CNC) Lathe Machine.
CO-2	To prepare program and execute it on Computer Numerical Control (CNC) Milling Machine.

Subject: CAD Lab **Code**: 8ME6A

CO-1	To design different parts of mechanical components.
CO-2	To prepare models of various designing and Manufacturing Industries.

Subject: IE Lab-II **Code**: 8ME7A

CO-1	To apply concepts of industrial engineering in industrial setup.
CO-2	To apply tools of statistical process control in an industry

Subject: Project-2 **Code**: 8MEPR

CO-1	To generate the solution of given problem and acquire the system integration skills.
CO-2	To prepare project with overall safety concern.
CO-3	To relate the documentation and communication skills.
CO-4	To develop, formulate and integrate the project with managerial skills.

Subject: Seminar **Code**: 8MESM

CO-1	To analyse the real technical problems
CO-2	To develop advance knowledge and leadership skills
CO-3	To manage communication skills and presentation skills