Karnatak Law Society's

Vishwanathrao Deshpande Institute of Technology, Haliyal

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Udyog Vidya Nagar, Haliyal – 581329, Dist: Uttar Kannada
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Department of Mechanical Engineering (2016-20 Batch)

Subject Code	Subject Name	CO	CO Statements
15MAT31	Engineering Mathematics-III	CO1	To know the use of periodic signals and to calculate Fourier series of periodic as well as non-periodic functions.
		CO2	To find the infinite Fourier transform and Z-transform of various functions and its applications to solve difference equations.
		CO3	To employ appropriate numerical methods to solve algebraic and transcendental equations
		CO4	To calculate the values of unknowns by various numerical methods and solve the definite integrals by various numerical methods.
		CO5	To apply vector integral theorems to solve the integrals and to find the extremal of the functional
Subject Code	Subject Name	CO	
15ME32	Material Science	CO1	Will be able to classify the different crystal structure and relate the different properties of material by making use of stress strain diagram
		CO2	Will be able to illustrate Slip and Twinning, Fracture, Creep and Fatigue under different loading conditions
		CO3	Will be able to compare the different solidification mechanism and construct the different types of phase diagram
		CO4	Will be able to analyze the Iron Carbon diagram and compare the microstructure for various kinds heat treatment.
		CO5	Will be able to classify Ferrous Nonferrous and Composite materials.
Subject Code	Subject Name	CO	CO Statements
15ME33	BASIC THERMODYNAMICS	CO1	Explain thermodynamic systems, properties, Zeroth law of thermodynamics, temperature scales and energy interactions.
		CO2	Determine heat, work, internal energy, Enthalpy for flow and non flow process using First Second Law of Thermodynamics.

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Subject Code	Subject Name	CO	CO Statements
		CO3	Interpret behavior of pure substances and its applications to practical problems.
		CO4	Determine change in internal energy, change in enthalpy and change in entropy using T-S relations for ideal gases.
		CO5	Calculate thermodynamic properties of real gases at all range of pressure and temperatures using modified equation of state including Vander Waal's equation Redlich Wong equation and Beattie-Bridgeman equation.
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME34	MECHANICS OF MATERIALS	CO1	Understand simple ,compound,thermal stresses and strains ,their relations Poisson's ratio Hooke's law ,mechanical properties
		CO2	Formulation of stress intencity for bars,compound sections, beams with various constraints
		CO3	Able to apply formulation to various structural members
		CO4	Able to analyse different machine components using MSS and MNS theory and strain energy
		CO5	
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME35A	METAL CASTING AND WELDING	CO1	Student will be able to recognize the basic casting process and compare the different types of moulding techniques
		CO2	Student will be able to identify different types of furnaces used in foundry
		CO3	Student will be able to identify different types of welding processes.
		CO4	Ability to recognize the Heat affected Zone(HAZ) and different welding defects.
		CO5	Ability to inspect the soldering, Brazing and welding joints using appropriate inspection methods.
		CO6	To provide adequate knowledge of quality test methods conducted on welded and casted components.
Subject Code	**Subject Name**	**CO**	**CO Statements**

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Subject Code	Subject Name	CO	CO Statements
15ME35B	MACHINE TOOLS AND OPERATIONS	CO1	Explain the construction and specification of various machine tools
		CO2	Describe various machining processes pertaining to relative motions between tool and work piece
		CO3	Explain the significance and functions of different tool materials, tool nomenclature, cutting fluids and surface finish
		CO4	Apply mechanics of machining process to evaluate machining forces and machining time
		CO5	Analyse tool wear mechanisms and equations to enhance tool life and minimize machining cost

Subject Code	Subject Name	CO	CO Statements
15ME36A	COMPUTER AIDED MACHINE DRAWING	CO1	Improve visualization skill, understand theory of projection
		CO2	Produce components , assembly drawing
		CO3	Recognize modern engineering tools, software environment to create engineering drawing
		CO4	Engage in lifelong learning using sketching and drawing as communication tool

Subject Code	Subject Name	CO	CO Statements
15ME36B	MECHANICAL MEASUREMENTS AND METROLOGY	CO1	Understand the objectives of metrology, methods of measurement, selection of measuring instruments, standards of measurement and calibration of end bars.

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Subject Code	Subject Name	CO	CO Statements
		CO2	Explain tolerance, limits of size, fits, geometric and position tolerances, gauges and their design and different comparators with their functional requirement.
		CO3	Describe the Terminology of screw threads, Measurements by 2-wire and 3-wire methods, Gear terminology, use of gear tooth Vernier Caliper.
		CO4	Explain measurement systems, transducers, intermediate modifying devices and terminating devices.
		CO5	Describe the Measurement of Force, Pressure Torque, Temperature and Strain measuring devices
Subject Code	**Subject Name**	**CO**	**CO Statements**
15MEL37A	MATERIALS TESTING LAB	CO1	Acquire experimentation skills in the field of material testing
		CO2	Develop theoretical understanding of the mechanical properties of materials by performing experiments
		CO3	Apply the knowledge to analyze a material failure and determine the failure inducing agent/s
		CO4	Apply the knowledge of testing methods in related areas
		CO5	Know how to improve structure/behavior of materials for various industrial applications
Subject Code	**Subject Name**	**CO**	**CO Statements**
15MEL37B	MECHANICAL MEASUREMENTS AND METROLOGY LAB	CO1	Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometre.
		CO2	Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set.

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Subject Code	Subject Name	CO	CO Statements
		CO3	Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats.
		CO4	Analyse Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometre.
		CO5	Understand the concepts of measurement of surface roughness.
Subject Code	**Subject Name**	**CO**	**CO Statements**
15MEL38A	FOUNDRY AND FORGING LAB	CO1	Identify the different tools required for the foundry and forging process.
		CO2	Ability to prepare the mould cavity for different shapes
		CO3	Apply the knowledge of forging to prepare different forging models
		CO4	Able to determine different properties of sand through proper sand testing methods
Subject Code	**Subject Name**	**CO**	**CO Statements**
15MEL38 B	MACHINE SHOP	C01	to provide an insight to different machine tools, accessories and attachments
		C02	to train students in to machining operations to enrich thier practice skills
		C03	to train the students team qualities and expose them to shoop floor activities
Subject Code	**Subject Name**	**CO**	**CO Statements**
15MAT41	**Engineering Mathematics-IV**	CO1	To solve higher order differential equation by various numerical techniques

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Subject Code	Subject Name	CO	CO Statements
		CO2	To solve the ordinary and partial differential equation by using special functions.
		CO3	To interpret the analyticity, calculate potential field residues and poles of complex potentials.
		CO4	To calculate and analyze the probability distribution of the given statistical data
		CO5	To analyze statistical inference based on the sampling distribution
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME42	**KINEMATICS OF MACHINES**	CO1	Identify mechanisms with basic understanding of motion.
		CO2	Comprehend motion analysis of planar mechanisms, gears, gear trains and cams. Carry out motion analysis of planar mechanisms, gears, gear trains and cams.
		CO3	Carry out motion analysis of planar mechanisms, gears, gear trains and cams.
		CO4	
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME43	**APPLIED THERMODYNAMICS**	CO1	Understand the concept and principles of heat engines, heat pumps, refrigerators, air conditioners, reciprocating compressor and steam nozzles.
		CO2	Understand the combustion phenomenon and exhaust gas analysis of fuels.
		CO3	Apply the concept of thermodynamics for gas power cycles, jet propulsion, vapour power cycles, IC engines, refrigerators, air conditioner and compressors.
		CO4	Analyze the performance of gas/vapour power cycles, refrigeration cycles, I.C.Engines, air conditioners, compressors and steam nozzles.

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Subject Code	Subject Name	CO	CO Statements
15ME44	**FLUID MECHANICS**	CO1	Able to identify and define the fluid properties used in the analysis of fluid behavior,
		CO2	Able to understand and apply the principles of pressure, buoyancy,flotation , laminar turbulence, and energy cinsideration in pipe flow
		CO3	Able to apply the knowledge of fluid statics, kinematics and dynamics while addressing problems of mechanical engineering
		CO4	Able to understand and apply the concept of boundary layer and dimensional analysis for input output variables, compressible flow and cfd.
15ME45A	**Metal Casting and Welding**	**CO**	
		CO1	Ability to recognize the basic casting process and compare the different types of moulding techniques
		CO2	Identify different types of furnaces used in foundry
		CO3	Ablility to identify different types of welding processes.
		CO4	Recognize the Heat affected Zone(HAZ) and different welding defects.
		CO5	Ability to inspect the soldering, Brazing and welding joints using appropriate inspection methods.
		-	
		-	
15ME45B	**Machine Tools and Operations**	**CO**	**CO Statements**
		CO1	Explain the construction and specification of various machine tools
		CO2	Describe various machining processes pertaining to relative motions between tool and work piece
		CO3	Explain the significance and functions of different tool materials, tool nomenclature, cutting fluids and surface finish
		CO4	Apply mechanics of machining process to evaluate machining forces and machining time

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		CO5	Analyse tool wear mechanisms and equations to enhance tool life and minimize machining cost
15ME46A	COMPUTER AIDED MACHINE DRAWING	**CO**	**CO Statements**
		CO1	Improve visualization skill, understand theory of projection
		CO2	Produce components , assembly drawing
		CO3	Recognize modern engineering tools, software environment to create engineering drawing
		CO4	Engage in lifelong learning using sketching and drawing as communication tool
		-	
15ME46B	MECHANICAL MEASUREMENTS AND METROLOGY	**CO**	**CO Statements**
		CO1	Understand the objectives of metrology, methods of measurement, selection of measuring instruments, standards of measurement and calibration of end bars.
		CO2	Explain tolerance, limits of size, fits, geometric and position tolerances, gauges and their design and different comparators with their functional requirement.
		CO3	Describe the Terminology of screw threads, Measurements by 2-wire and 3-wire methods, Gear terminology, use of gear tooth Vernier Caliper.
		CO4	Explain measurement systems, transducers, intermediate modifying devices and terminating devices.
		CO5	Describe the Measurement of Force, Pressure Torque, Temperature and Strain measuring devices
15MEL45B	Mechanical Measurements and Metrology Lab	**CO**	**CO Statements**
		CO1	Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometre.
		CO2	Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set.
		CO3	Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats.

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		CO4	Analyse Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometre.
		CO5	Understand the concepts of measurement of surface roughness.
15MEL47A	MATERIAL TESTING LAB	**CO**	**CO Statements**
		CO1	Acquire experimentation skills in the field of material testing
		CO2	Develop theoretical understanding of the mechanical properties of materials by performing experiments
		CO3	Apply the knowledge to analyze a material failure and determine the failure inducing agent/s
		CO4	Apply the knowledge of testing methods in related areas
		CO5	Know how to improve structure/behavior of materials for various industrial applications
15MEL48A	FOUNDRY AND FORGING Lab	**CO**	**CO Statements**
		CO1	Identify the different tools required for the foundry and forging process.
		CO2	Ability to prepare the mould cavity for different shapes
		CO3	Apply the knowledge of forging to prepare different forging models
		CO4	Able to determine different properties of sand through proper sand testing methods
15MEL48B	Machine Shop LAB	**CO**	**CO Statements**
		CO1	to provide an insight to different machine tools, accessories and attachments
		CO2	to train students in to machining operations to enrich thier practice skills
		CO3	to train the students team qualities and expose them to shoop floor activities

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		Subject Name	CO	CO Statements
15ME51		Management And Engineering Economics	CO1	Understand needs, functions, roles, scope and evolution of Management
			CO2	Understand importance, purpose of Planning and hierarchy of planning and also analyze
			CO3	Discuss Decision making, Organizing, Staffing, Directing and Controlling
			CO4	Select the best economic model from various available alternatives
			CO5	Understand various interest rate methods and implement the suitable one.
			CO6	Estimate various depreciation values of commodities
Subject Code	**Subject Name**		**CO**	**CO Statements**
15ME52	Dynamics Of Machines		CO1	Determine the forces and couples for static and dynamic conditions of four bar and slider crank mechanisms to keep the system in equilibrium. and Determine magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes.
			CO2	Determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine.
			CO3	Determine sensitiveness, isochronism, effort and power of porter and hartnell governorsn and Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aeroplanes.
			CO4	Understand types of vibration, SHM and methods of finding natural frequencies of simple mechanicalsystems & Determine equation of motion, natural frequency, damping factor, logarithmic decrement of damped free vibration (SDOF) systems.

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		CO5	Determine the natural frequency, force and motion transmissibility of single degree freedom systems.
		CO6	Determine equation of motion of rotating and reciprocating unbalance systems, magnification factor, and transmissibility of forced vibration (SDOF) systems.
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME53	Turbomachines	CO1	Concept of turbomachines and comparison with Positive displacement machine, Model analysis.
		CO2	Analyze the performance characteristics of turbomachines through dimensional analyses by applying geometric ,flow and fluid properties..
		CO3	Explain the various components of energy transfer in turbo machines and velocity triangles.
		CO4	Analyze the performance characteristics of Steam turbine and Hydraulic turbine.
		CO5	Analyze the performance characteristics of Pump ,Blower and Compressor.
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME54	Design Of Machine Elements - I	CO1	Apply the concepts of selection of materials for given mechanical components. List the functions and uses of machine elements used in mechanical systems,Apply codes and standards in the design of machine elements
		CO2	Analyse the performance and failure modes of mechanical components subjected to combined loading and fatigue loading using the concepts of theories of failure
		CO3	Demonstrate the application of engineering design tools to the design of machine components like shafts, keys and couplings.
		CO4	Demonstrate the application of engineering design tools to the design of machine components like welded and riveted joint
		CO5	Demonstrate the application of engineering design tools to the design of machine components like temporary joints:Threaded fasteners and Power Screws
Subject Code	**Subject Name**	**CO**	**CO Statements**

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Subject Code	Subject Name	CO	CO Statements
15ME554	Non Traditional Machining	CO1	Understand and compare traditional and non-traditional machining process and recognize the need for Non- traditional machining process
		CO2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM
		CO3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations
		CO4	Understand the constructional features of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM
		CO5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME564	Project Manaement	CO1	To define a project, types, characteristics, measures, identify project roles, strategic planning and portfolio Management, select and prioritize projects with scoring models
		CO2	To enumerate, describe, and prioritize, set scope for a project. Integrating Coding the Work Breakdown Structure (WBS). Identify ways for project Scheduling, methods, potential problems, and Gantt chart
		CO3	Create a Human Resources Management Plan, define project cost terms, estimating project Cost, cost control. Plan for risk management, Prioritize, project quality, tools, project management plan, kick-off the project, baseline, and plan.
		CO4	To identify the role of supply chain management, plan, conduct, control, partnering and collaborations. Create project progress report. Describe process for terminating a project, Secure customer feedback and acceptance, create transition plan, sharing lessons learned.
		CO5	Understand the basic rules of network construction, Analyze Activity on Node (AON) and Activity on Arrow (AOA), Solve Program (Project) Management and Review Technique (PERT) and Critical Path Method
Subject Code	**Subject Name**	**CO**	**CO Statements**

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Subject Code	Subject Name	CO	CO Statements
15ME562	Energy and Environment	CO1	understand energy scenario,energy sources and their utilization
		CO2	learn about methods of energy storage, energy management and economic analysis
		CO3	to have proper awareness about environment and eco system
		CO4	understand the environment pollutionalong with social issues and acts
Subject Code	Subject Name	CO	CO Statements
15MEL57	Fluid Mechanics & Machinery Lab	CO1	Able to understand, analysis and conclude the experiments of flow measuring devices like V-notch, orifice meter and venturimeter.
		CO2	Able to measure the minor and malor losses, also analysis and conclude the experiments.
		CO3	Able to understand, analysis the operating chractertic of pumps
		CO4	Able to understand, analysis the operating chractertic of Turbines
Subject Code	Subject Name	CO	CO Statements
15MEL58	Energy Lab	CO1	Perform experiments to determine the properties of fuels and oils.
		CO2	Test basic performance parameters of I.C. Engine and implement the knowledge in industry.
		CO3	Identify exhaust emission, factors affecting them and report the remedies.
		CO4	Demonstration of valve/port timing diagram and assembly of IC engines
Subject Code	Subject Name	CO	CO Statements
15ME61	Finite Element Analysis	CO1	Understand the concepts behind formulation methods in FEM
		CO2	Identify the application and characteristics of FEA elements such as bars ,beams ,plane and isoparametric elements
		CO3	Develop element characteristic equation and generation of global equation

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Subject Code	Subject Name	CO	CO Statements
		CO4	Able to apply suitable boundary condition to global equation for bars,trusses,beams,circular shafts,heat transfer,fluid flow,axisymmetric and dynamic problems and solve them displacements,stress and strains
Subject Code	Subject Name	CO	CO Statements
15ME62	Computer Integrated Manufacturing	CO1	Able to define Automation, CIM, CAD, CAM and explain the differences between these concepts. Solve simple problems of transformations of entities on computer screen.
		CO2	Explain the basics of automated manufacturing industries through mathematical models and analyze different types of automated flow lines.
		CO3	Analyze the automated flow lines to reduce down time and enhance productivity.
		CO4	Explain the use of different computer applications in manufacturing, and able to prepare part programs for simple jobs on CNC machine tools and robot programming.
		CO5	Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of Things leading to Smart Manufacturing.
Subject Code	Subject Name	CO	CO Statements
15ME63	Heat Transfer	CO1	Understand the basic modes of heat transfer and laws governing.
		CO2	Compute temperature distribution in steady and unsteady state heat conduction by using thermal resistance concepts and numerical methods.
		CO3	Understand and interpret heat transfer through extended surfaces
		CO4	Interpret and compute forced,free convection by using correlations and radiation heat transfer
		CO5	Design and analyse heat exchanges using LMTD and NTU methods
Subject Code	Subject Name	CO	

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15ME64	Design of Machine Elements-II	CO1	To understand various types of springs used in mechanical systems and design different types of springs helical coil springs of circular and non-circular cross sections. Tension and compression springs, concentric springs; springs under fluctuating loads. Leaf Springs etc.
		CO2	To select and design transmission elements like belts, pulleys, wire ropes etc.
		CO3	To select and design gear drives like spur gear, helical gear, bevel gear and worm gear.
		CO4	To understand and design different types of clutches and brakes used in mechanical and automobile systems.
		CO5	To understand the concept of lubrication and different types of lubrication. Design of different types of bearings
Subject Code	Subject Name	CO	CO Statements
15ME655	Automobile Engineering	CO1	Identify the different parts of an automobile and it's working.
		CO2	Understand the working of transmission and braking systems.
		CO3	Understand the working of steering and suspension systems and their applications.
		CO4	Selection and applications of various types of fuels and injection systems.
		CO5	Analyse the cause of automobile emissions, its effects on environment and methods to reduce the emissions.
Subject Code	Subject Name	CO	CO Statements
15ME664	Total Quality Management	CO1	Explain the various approaches of TQM
		CO2	Infer the customer perception of quality
		CO3	Analyze customer needs and perceptions to design feedback systems.
		CO4	Apply statistical tools for continuous improvement of systems
		CO5	Apply the tools and technique for effective implementation of TQM.
Subject Code	Subject Name	CO	CO Statements

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15MEL67	Heat Transfer Lab	CO1	Apply one dimensional steady and unsteady state conduction heat transfer through cylinder, composite slab and cylindrical pin fin.
		CO2	Evaluate the Stefan Boltzmann constant and Emissivity for thermal radiation.
		CO3	Compute average heat transfer coefficient for free ,forced convection, film wise and drop wise condensation
		CO4	Analyse the performance of heat exchanger, vapour compression refrigeration and Air-conditioning system.
Subject Code	Subject Name	CO	CO Statements
15MEL68	Modeling and Analysis Lab(FEA)	CO1	Did you acquire basic understanding of Modeling and Analysis software
		CO2	Understanding the different kinds of analysis and application of basic principles to find out the stress and other related parameters of bars, beams loaded with loading conditions.
		CO3	Understanding the thermal analysis of 1D and 2D problems with conduction and convection boundary conditions
		CO4	Applying the basic principles to carry out dynamic analysis to know the natural frequency of different kind of beams.

Subject Code	Subject Name	CO	CO Statements
15ME71	Energy Engineering	CO1	Understand energy scenario, energy sources and their utilization
		CO2	understand and apply energy conversion methods and their analysis
		CO3	understand and apply principles of renewable energy conversion systems
		CO4	understand the concept of green energy and zero energy
Subject Code	Subject Name	CO	CO Statements
15ME72	Fluid Power System	CO1	Identify and analyse the functional requirements of a fluid power transmission system for a given application

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Department of Mechanical Engineering (2016-20 Batch)

Subject Code	Subject Name	CO	CO Statements
		CO2	Visualize how a hydraulic/pneumatic circuit will work to accomplish the function
		CO3	Design and Develop appropriate hydraulic or pneumatic circuit or combination circuit like electro-hydraulics, electro- pneumatics for a given application.
		CO4	Select and size the different components of the circuit, develop a comprehensive circut diadgram for given Application.
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME73	Control Engineering	CO1	Recognize control system and its types , control actions.
		CO2	Determine the system governing equations for physical models(Electrical, Thermal,Mechanical, Electro Mechanical)
		CO3	Calculate the gain of the system using block diagram and signal flow graph
		CO4	Illustrate the response of 1st and 2nd order systems
		CO5	Determine the stability of transfer functions in complex domain and frequency domain
		CO6	Employ state equations to study the controllability and observability
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME742	Tribology	CO1	Understand the fundamentals of tribology and associated parameters.
		CO2	Apply concepts of tribology for the performance analysis and design of components experiencing relative motion.
		CO3	Analyse the requirements and design hydrodynamic journal and plane slider bearings for a given application.
		CO4	Select proper bearing materials and lubricants for a given tribological application.
		CO5	Apply the principles of surface engineering for different applications of tribology.
Subject Code	**Subject Name**	**CO**	**CO Statements**

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15ME753	Mechatronics	CO1	Illustrate various components of Mechatronics systems.
		CO2	Assess various control systems used in automation.
		CO3	Develop mechanical, hydraulic, pneumatic and electrical control systems.
Subject Code	Subject Name	CO	CO Statements
15MEL76	Design Lab	CO1	To understand the natural frequency, logarithmic decrement, damping ratio and damping.
		CO2	To understand the balancing of rotating masses and critical speed of a rotating shaft
		CO3	To understand the concept of stress concentration using photo elasticity an principles of pressure development in an oil film of a hydrodynamic journal bearing.
		CO4	To understand the equilibrium speed, sensitiveness, power and effort of governor.
Subject Code	Subject Name	CO	CO Statements
15MEL77	CIM Lab	CO1	Able to recognize & handle design problem in systematic manner
		CO2	To gain practical experience in 2D drafting and 3D modelling using software
		CO3	Able to apply CIM in real life applications
		CO4	To recognize the concepts of G and M codes for part programming
		CO5	To expose students to advanced control systems like Fanuc etc
		CO6	To know the various applications of CNC machine and exposure to CNC machine
Subject Code	Subject Name	CO	CO Statements
15MEP78	Project Phase – I	CO1	Ability to consolidate the literature search to identify and formulate engineering problem.
		CO2	Ability to identify the community that shall benefit through the solution to the identified engineering problem and also demonstrate concern for environment.

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		CO3	Ability to engage in groups to identify the mathematical, engineering, management principles necessary to solve the identified engineering problem.
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME81	Operations Research	CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method.
		CO2	Formulation of Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems
		CO3	Formulation and solve problems on game theory for pure and mixed strategy under competitive environment, waiting line problems for M/M/1 and M/M/K queuing models.
		CO4	Construct network diagrams and determine critical path, determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3machines, n jobs-m machinesand2 jobs-n machines using Johnson's algorithm.
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME82	Additive Manufacturing	CO1	Understand the different process of Additive Manufacturing. using Polymer, Powder and Nano materials manufacturing
		CO2	Analyze the different characterization techniques
		CO3	Describe the various NC, CNC machine programing and Automation techniques
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME835	Product life cycle management	CO1	Understand the various strategies of PLM and PDM
		CO2	Understand decomposition of product design and model simulation

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		CO3	Apply the concept of new product development and its structuring
		CO4	Analyze technological forecasting and tools in used Industry
			Apply virtual product development and model analysis
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME84	Internship / Professional Practice	CO1	Able to acquire knowledge pertaining to best practices in the industry and correlate with the courses learnt
		CO2	Able to identify industrial activities and to some extent related problems
		CO3	Able to communicate with people, coordinate for performing the task and build rapport with the people maintaining ethics
		CO4	Able to comprehend and present the report
Subject Code	**Subject Name**	**CO**	**CO Statements**
15ME85	Project Phase – II	CO1	Ability to apply the identified concepts and modern engineering tools to arrive at design solutions for the identified engineering problems.
		CO2	Ability to demonstrate compliance to the prescribed standards / safety norms through implementation for the identified engineering problem.
		CO3	Ability to engage in effective oral communication through presentation of the project work.
Subject Code	**Subject Name**	**CO**	**CO Statements**
15MES86	Seminar	CO1	Prepare comprehensive report based on literature survey related to recent engineering development
		CO2	Comprehend the engineering activities with effectivepresentation
		CO3	Able to summarize, technical societal information through various resources
		CO4	Justify the presentation content individually to a group