

**Terna Engineering College, Nerul, Navi Mumbai**  
**Mechanical Engineering Department**

	SUBJECT CODE	SUBJECT	CO Statement
SEM I	FEC101	Applied Mathematics-I	CO1 Student will be able to solve complex and hyperbolic functions.
			CO2 Students will be able to learn log of complex number and successive differentiation.
			CO3 Students will be able to solve and apply matrices.
			CO4 Students will be able to solve partial differentiation.
			CO5 Students will be able to apply partial differentiation and expansion of functions.
			CO6 Students will be able to solve algebraic equations and transcendental equations.
	FEC102	Applied Physics-I	CO1 Understand the concept of crystallography and its application in different crystal structure.
			CO2 To gain the knowledge of basic theoretical physics and understanding quantum phenomenon using mathematics
			CO3 To understand the electron behavior in metals, semiconductor and insulator and further apply it to electronic devices.
			CO4 Understanding of Superconducting property and their applications
			CO5 Applying the concept of ultrasonics in various applications
			CO6 Understand the principle of acoustics in designing the auditorium Hall.
	FEC103	Applied Chemistry -I	CO1 Apply the knowledge of types of hardness of water and its estimation.
			CO2 Apply the knowledge of various softening and disinfecting methods.
			CO3 Apply the knowledge of various polymers, their synthesis, properties and uses along with their fabrication techniques.
			CO4 Apply the knowledge of thermodynamics in studying different chemical systems in equilibrium obeying Gibb's phase rule.
			CO5 Apply the knowledge of lubricants, types, properties and mechanisms to avoid frictional resistance.
			CO6 Demonstrate the knowledge of Portland cement and carbon nanomaterials.
	FEC104	Engineering Mechanics	CO1 Construct free body diagram and calculate the reactions for static equilibrium.
			CO2 Determine the centroid of plane lamina.
			CO3 Calculate the internal forces, moments and distributed loads in members.
			CO4 Evaluate the velocity, acceleration, time force and energy of the particle as well as rigid bodies.
			CO5 Locate instantaneous centre of rotation for rigid bodies having plane motion.
			CO6
FEC105	Basic Electrical Engineering	CO1 Student will be able to understand fundamentals of DC circuits and apply knowledge for analysing network theorems in DC circuits.	
		CO2 Students will be able to learn the fundamentals and analyse single phase AC circuits.	
		CO3 Students will be able to learn the fundamentals and analyse three phase AC circuits.	
		CO4 Students will be able to learn the basic operation and analyse the performance of single phase transformer.	
		CO5 Students will be able to understand the construction and basic operation of DC motors and generators.	
		CO6	
FEC106	Environmental studies	CO1 Illustrate Depleting Nature of Environmental Resources, Global Environmental Crisis, Ecosystem concept	
		CO2 Adapt to 3R (Reuse, Recovery, Recycle)	
		CO3 Study different control measures related to Environmental Pollution.	
		CO4 Illustrate and analyse various Case Studies related to Environmental Legislation.	
		CO5 Demonstrate the working of Renewable energy sources & Equipments	
		CO6 Illustrate the Techniques of Disaster Management and Green Building.	
FEL101	Basic Workshop Practice-I	CO1 Identify different fitting tools.	
		CO2 Use tools, setting of tools and perform operations.	
		CO3 Identify different forging tools.	
		CO4 Understand forging process.	
		CO5 Identify different Welding Tools.	
		CO6 Set welding tools and perform different operations.	
SEM II	FEC201	Applied Mathematics-II	CO1 Student will be able to solve complex and hyperbolic functions.
			CO2 Students will be able to learn log of complex number and successive differentiation.
			CO3 Students will be able to solve and apply matrices.
			CO4 Students will be able to solve partial differential equations.
			CO5 Students will be able to apply partial differential equation and expansion of functions.
			CO6 Students will be able to solve algebraic equations and transcendental equations.
	FEC202	Applied Physics-II	CO1 Understanding the wave properties of light
			CO2 Understand the concept of spontaneous & stimulated emission, construction and working of various Laser and applications
			CO3 Understand the concept of optical fibres and its applications
			CO4 Comprehend the concept of electrodynamics and Maxwell's equations for understanding communication system
			CO5 Understand the electron behavior in electric and magnetic field with special focus on focussing system & CRO
			CO6 Comprehend the significance of Nanoscience and nanotechnology and applications
	FEC203	Applied Chemistry-2	CO1 Identify types of corrosion and factors affecting it related to problems affecting all industries.
			CO2 Identify different types of corrosion control methods to study corrosion control in various industries.
			CO3 Apply the knowledge of different types of fuels, including their production and refining methods and combustion mechanisms.
			CO4 Illustrate composition and properties of different types of alloys and the process of powder metallurgy.
			CO5 Illustrate principles of green chemistry.
			CO6 Illustrate properties and applications of different types of composite materials.
	FEC204	Engineering Drawing	CO1 Apply the basic principles of projections in 2D drawings.
			CO2 Apply the basic principles of projections in converting 3D view to 2D drawing.
			CO3 Read a given drawing.
			CO4 Visualize an object from the given two views.
			CO5 Use CAD tool to draw different views of a 3D object.
			CO6 Use CAD tool to draw an object in 3D.
FEC205	Structured Programming Approach	CO1 Students will be able to explain the basic terminologies used in computer programming and able to develop and analyse algorithm for a given problem	
		CO2 Students will be able to use different data types, operators in a computer program and handle the input output process.	
		CO3 Students will be able to develop conditional and iterative statements to write c programs.	
		CO4 Students will be able to exercise user defined functions to solve real time problems.	
		CO5 Students will be able to use derived and user defined data types like arrays, strings, structure and union.	
		CO6 Students will be able to inscribe c programs using files and pointers.	
FEC206	Communication Skills	CO1 Identify, interpret and construct appropriate messages for a variety of contexts.	
		CO2 Display oral and written skills in the English language in different scenarios of business communication.	
		CO3 Enhance the proficiency to use appropriate language for technical writing.	
		CO4 Demonstrate good comprehension, inference making, vocabulary building, paraphrasing and summarizing.	
		CO5	
		CO6	
FEL201	Basic Workshop Practice -II	CO1 Identify different Carpentry tools.	
		CO2 Use carpentry tools, setting of tools and perform operations.	
		CO3 Understand different parts of lathe machine.	
		CO4 Understand different operations performed on lathe machine.	
		CO5 understand different electrical wiring diagrams.	
		CO6 Connect different connections on electrical board	
MEC301	AM-III Abhishek Jadhav	CO1 Demonstrate the ability of using Laplace Transform in solving the Ordinary Differential Equations and Partial Differential Equations	
		CO2 Demonstrate the ability of using Fourier Series in solving the Ordinary Differential Equations and Partial Differential Equations	
		CO3 Solve initial and boundary value problems involving ordinary differential equations	
		CO4 Identify the analytic function, harmonic function, orthogonal trajectories	
		CO5 Apply bilinear transformations and conformal mappings	
		CO6 Identify the applicability of theorems and evaluate the contour integrals.	
			CO1 Demonstrate application of the laws of thermodynamics to wide range of systems.
			CO2 Write steady flow energy equation for various flow and non-flow thermodynamic systems.

SEM III	MEC302	THERMODYNAMICS	C03	Compute Heat ,Work and Entropy interactions in thermodynamics systems
			C04	Demonstrate the interrelations between thermodynamic functions and use steam table and mollier chart to solve practical problems.
			C05	Demonstrate working principle of Rotary and Reciprocating Compressors.
			C06	Compute efficiencies of heat engines, power cycles etc.
	MEC303	SOM	C01	Demonstrate fundamental knowledge about various types of loading, stresses ,strain & deformation induced in mechanical components.
			C02	Analyse the SFD and BMD for different types of loads and support conditions.
			C03	Analyse direct,bending and shear stresses in beams and other mechanical components.
			C04	Evaluate the torsion & strain energy in mechanical elements.
			C05	Analyse the deflection in beams
			C06	Analyse buckling phenomenon in columns and struts.
	MEC304	PP-I	C01	Demonstrate understanding of casting process
			C02	Illustrate principles of joining processes
			C03	Illustrate principles of forming processes
			C04	Illustrate the concept of producing polymer components and ceramic components
	MEC305	MT	C05	Differentiate chip forming processes such as turning, milling, drilling, etc.
			C06	Distinguish between the conventional and modern machine Tools
			C01	Identify various crystal imperfections, deformation mechanisms, and strengthening mechanisms
			C02	Demonstrate understanding of various failure mechanisms of materials.
			C03	Interpret Iron-iron carbide phase diagram, and different phases in microstructures of materials at different conditions.
			C04	Select appropriate heat treatment process for specific applications.
	MEL301	CAMD	C05	Identify effect of alloying elements on properties of steels
			C06	Illustrate basics of composite materials, Nano- materials and smart materials
			L01	Visualize and prepare detail drawing of a given object.
			L02	Read and interpret the drawing
L03			Draw details and assembly of different mechanical systems.	
L04			Convert detailed drawing into assembly drawing using modelling software	
MEL302	SOM	L05	Convert assembly drawing into detailed drawing using modelling software	
		L06	Prepare detailed drawing of any given physical object/machine element with actual measurements	
		L01	Tension test on mild steel bar (stress - strain behavior, modulus determination)	
		L02	Torsion test on mild steel bar/cast iron bar	
		L03	Brinell hardness test	
		L04	Rockwell hardness test	
MEL303	MT	L05	Izod impact test / Charpy test	
		L06	Flexural test on beam (central point load)	
		L01	Demonstrate the understanding of the procedure to prepare samples for studying microstructure using microscope (metallography)	
		L02	Interpret different phases present in different plain carbon steels and cast irons.	
		L03	Perform different heat treatment processes for a steel and observe microstructures in these conditions	
		L04	Identify effects of Annealing, Normalizing and Hardening on microstructure of medium carbon steel	
MEL304	MSP I	L05	Determine hardenability of steel using Jominy end Quench test	
		L06	Determine S-N curve by Fatigue Test.	
		L01	Operate various machines like lathe, shaper etc	
		L02	Perform plain turning, taper turning, and screw cutting etc. on lathe machine.	
		L03	Perform machining operations on shaper.	
		L04	Demonstrate metal joining process like compressive welding.	
SEM -IV	MEC401	AM-IV	L05	Perform forging operations
			L06	
			C01	Mathematics Fundamental necessary to formulate, Solve & analyze Engineering Problems.
			C02	An ability to relate Engineering Problems to Mathematical Contacts.
			C03	Provide a Solid Foundation in Mathematical Fundamentals required to solve Engineering Problems.
			C04	An Understanding of Linear Algebra through Matrices.
	MEC402	FM	C05	Basic Principles of Vector Analysis, Sampling Theory & Probability.
			C06	Basic Principles of Probability & Probability Distribution.
			C01	Define properties of fluids and classification of fluids Evaluate hydrostatic forces on various surfaces and predict stability of floating bodies
			C02	Apply fundamentals of kinematics for different flow patterns
			C03	Formulate and solve equations of the control volume for fluid flow systems by applying Bernoullis equation.
			C04	Calculate resistance to flow of incompressible fluids through closed conduits
	MEC403	IE	C05	Calculate resistance to flow of incompressible fluids over surfaces considering boundary layer phenomenon.
			C06	Apply fundamentals of compressible fluid flows to relevant systems
			C01	Illustrate construction, working principles and applications of power electronic switches
			C02	Identify rectifiers and inverters for dc and ac motor speed control
			C03	Develop circuits using OPAMP and timer IC555
			C04	Identify digital circuits for industrial applications
	MEC404	PP-II	C05	Illustrate the knowledge of basic functioning of microcontroller
			C06	Analyse speed-torque characteristics of electrical machines for speed control Module
			C01	Demonstrare understanding of metal cutting principles and mechanisms
			C02	Identify cutting tool geometry of single point and multipoint cutting tool
			C03	Demonstrate various concepts of sheet metal forming operations
			C04	Demonstrate concepts and use of jigs and fixtures
MEC405	KOM	C05	Illustrate various non traditional machining techniques	
		C06	Illustrate concepts and applications of additive manufacturing.	
		C01	Define various components of mechanisms and its inversions	
		C02	Develop mechanisms to provide specific motion	
		C03	Analysise velocity and acceleration of various mechanisms	
		C04	Draw Cam profile for the specific follower motion	
MEL401	DBIRS	C05	Select appropriate power transmission for specific application	
		C06	Analyse forces in various gears and select appropriate gear train based on power transmission.	
		L01	Identify data models and schemes in DBMS	
		L02	Demonstrate the features of database management systems and Relational database	
		L03	Use SQL- the standard language of relational databases	
		L04	Demonstrate understanding of functional dependencies and design of the database	
MEL402	FM	L05	Design graphical user Interface for specific application	
		L06	Create visual software entities	
		L01	Read manometers,different gauges and maintain them.	
		L02	Verify the conditions of equilibrium of floating body	
		L03	Calibrate Venturimeter, Orificemeter and Pitot tube	
		L04	Verify the Bernoulli's Principle	
MEL403	IE	L05	Calculate major and minor losses in pipe system	
		L06	Read manometers and maintain them.	
		L01	Demonstrate characteristics of various electrical and electronics components	
		L02	Develop simple applications built around these components	
		L03	Identify use of different basic gates	
		L04	Identify and use digital circuits for industrial applications	
MEL404	KOM	L05	Built and demonstrate basic parameter measurement using microcontroller	
		L06	Test and Analyse speed-torque characteristics of electrical machines for speed control.	
		L01	Draw velocity diagram by instantaneous center method	
		L02	Draw velocity and acceleration diagrams for four bar mechanism by relative method.	
			L03	Draw velocity and acceleration diagrams for Slider crank mechanism by relative method
			L04	Draw Cam profile for the specific follower motion

MEL405	MSP II	LO5	Plot displacement-time, velocity-time, acceleration-time cam profiles
		LO6	Develop and build mechanisms to provide specific motion
		LO1	Operate lathe machine,
		LO2	Perform shaping operations
		LO3	Perform finishing operations on grinding machine
		LO4	Perform milling operations.
MEC501	IC ENGINE	LO5	Perform precision turning
		LO6	Perform drilling and threading operations.
		CO1	To Understand overall basic of IC Engine
		CO2	Demonstrate the working of different systems and processes of S.I. engines
		CO3	Demonstrate the working of different systems and processes of C.I. engines
		CO4	Illustrate the working of lubrication, cooling and supercharging systems.
MEC502	MMC	CO5	Analyse engine performance
		CO6	Illustrate the emission norms , control AND comprehensive different technological advances in engines and alternate fuels
		CO1	Classify various types of static characteristics and types of errors occurring in the system.
		CO2	Classify and select proper measuring instrument for linear and angular displacement
		CO3	Classify and select proper measuring instrument for pressure and temperature measurement
		CO4	Design mathematical model of system/process for standard input responses
MEC503	HEAT TRANSFER	CO5	Analyse error and differentiate various types of control systems and time domain specifications
		CO6	Analyse the problems associated with stability
		CO1	Identify the three modes of heat transfer (conduction, convection and radiation).
		CO2	Illustrate basic modes of heat transfer
		CO3	Develop mathematical model for each mode of heat transfer
		CO4	Develop mathematical model for transient heat transfer
MEC504	DOM	CO5	Demonstrate and explain mechanism of boiling and condensation
		CO6	Analyse different heat exchangers and quantify their performance
		CO1	Demonstrate working Principles of different types of governors and Gyroscopic effects on the mechanical systems
		CO2	Illustrate basic of static and dynamic forces in slider crank mechanism, engine and turning moment on crank shaft.
		CO3	Determine natural frequency of element/system
		CO4	Determine vibration response of mechanical element / system
MEDLO501X	PTD	CO5	Design vibration isolation system for a specific application
		CO6	Understand the basic concepts of rotor dynamics, balancing of forces and couples
		CO1	Demonstrate various press working operations for mass production of sheet metal parts
		CO2	Prepare working drawings and setup for economic production of sheet metal components
		CO3	Select suitable materials for different elements of press tools
		CO4	Illustrate the principles and blank development in bend and drawn components
MEL501	IC ENGINE	CO5	Identify press tool requirements to build concepts pertaining to design of press tools
		CO6	Elaborate failure mechanisms of pressed components, safety aspects and automation in press working
		LO1	Dismantle engine assembly
		LO2	Overhaul and Assemble engine components
		LO3	Perform load test/speed test on engine setup
		LO4	Calculate performance of multi cylinder engine
MEL502	MMC	LO5	Analyse engine performance and draw heat balance sheet
		LO6	Perform exhaust gas analysis
		LO1	calibrate displacement sensors
		LO2	Calibrate pressure and vacuum gauges
		LO3	Measure torque using strain gauge
		LO4	Identify system/process characteristics for standard input process
MEL503	HT	LO5	Identify various types of control systems and time domain specification
		LO6	Analyse problem associated with stability
		LO1	Estimate thermal conductivity of metals/non metals/liquids
		LO2	Compute heat transfer coefficient in natural as well forced convection
		LO3	Measure emissivity of grey body
		LO4	Quantify fin effectiveness/efficiency
MEL504	DOM	LO5	Analyse heat exchanger performance
		LO6	Demonstrate energy balance for heat exchanger
		LO1	Plot and analyse governor characteristics
		LO2	Analyse gyroscopic effect on laboratory model
		LO3	Estimate natural frequency of mechanical systems
		LO4	Analyse vibration response of mechanical systems
MEL505	MS LAB	LO5	Determine damping coefficient of a system
		LO6	Balance rotating mass in different plane
		LO1	To acquaint with the concepts pertaining to planning and sequencing of operations.
		LO2	To prepare for designing of simple productive and cost effective jigs and fixtures.
		LO3	To acquaint with the various press working operations for mass production of sheet metal components and sheet metal working techniques for design of press tools.
		LO4	To familiarize with methods of force measurement during machining.
MEL506	BCE	LO5	To familiarize with methods of temperature measurement during machining.
		LO6	To familiarize with the design procedures for cutting tools.
		LO1	Design a technical document using precise language, suitable vocabulary and apt style.
		LO2	Develop the life skills/ interpersonal skills to progress professionally by building stronger relationships.
		LO3	Demonstrate awareness of contemporary issues knowledge of professional and ethical responsibilities.
		LO4	Apply the traits of a suitable candidate for a job/higher education, upon being trained in the techniques of holding a group discussion, facing interviews and writing resume/SOP.
MEC601	MQE	LO5	Deliver formal presentations effectively implementing the verbal and non-verbal skills
		LO6	Apply codes of ethical conduct, personal integrity and norms of organizational behaviour.
		CO1	Demonstrate inspection methods and different gauges
		CO2	Illustrate working principle of measuring instruments and calibration methodology
		CO3	Demonstrate characteristics of screw threads, gear profile, and tool profile
		CO4	Illustrate basic concepts and statistical methods in quality control
MEC602	MD-I	CO5	Illustrate the different sampling techniques in quality control
		CO6	Illustrate different nondestructive techniques used for quality evaluation
		CO1	Demonstrate understanding of various design considerations
		CO2	Apply basic principles of machine design
		CO3	Design machine elements on the basis of strength and standardization
		CO4	Use design data books and various standard codes of practices
MEC603	FEA	CO5	Acquire skill in preparing production drawings of various components designed
		CO6	To understand criteria of failure of mechanical components
		CO1	Solve differential equations using weighted residual methods
		CO2	Develop the finite element equations to model engineering problems governed by second order differential equations
		CO3	Apply the basic finite element formulation techniques to solve engineering problems by using one dimensional elements
		CO4	Apply the basic finite element formulation techniques to solve engineering problems by using two dimensional elements
		CO5	Apply the basic finite element formulation techniques to find natural frequency of single degree of vibration system

SEM-V	MEC604	RAC	CO6	Use commercial FEA software, to solve problems related to mechanical engineering
			CO1	Understand fundamental refrigeration and air conditioning principles
			CO2	Identify and locate various important components of the refrigeration system
			CO3	Identify and locate various important components of the air conditioning system
			CO4	Illustrate various refrigeration processes using psychometric chart
			CO5	Illustrate various air conditioning processes using psychometric chart
	MEDLO602X	DEPARTMENT LEVEL ELECTIVE MTRX	CO6	Design and analyze complete air conditioning system
			CO1	Demonstrate mechatronics system into a block diagram
			CO2	Identify the suitable sensor and actuator for a mechatronics system
			CO3	Demonstrate understanding of data acquisition, signal conditioning and microcontroller system theory
			CO4	Design hydraulic/pneumatic circuits
			CO5	Select suitable logic controls and analyse continuous control logics for standard input conditions
	MEL601	MQE	CO6	Develop ladder logic programming
			LO1	Measure linear and angular dimensions
			LO2	Measure surface roughness
			LO3	Measure various parameters of gear tooth profile
			LO4	Use optical profile projector for measurement
			LO5	Use floating carriage micrometer for measurement of screw threads
	MEL602	MD-I	LO6	Measure flatness by Interferometry method
			LO1	Design shaft under various conditions
			LO2	Design Knuckle Joint / cotter joint
			LO3	Design Screw Jack/C-clamp along with frame
			LO4	Design Flexible flange couplings/ Leaf spring
			LO5	Convert design dimensions into working/manufacturing drawing
	MEL603	FEA	LO6	Use design data book/standard codes to standardise the designed dimensions
			LO1	Select appropriate element for given problem
			LO2	Select suitable meshing and perform convergence test
LO3			Select appropriate solver for given problem	
LO4			Interpret the result	
LO5			Apply basic aspects of FEA to solve engineering problems	
MEL604	RAC	LO6	Validate FEA solution	
		LO1	Demonstrate fundamental principles of refrigeration and air conditioning	
		LO2	Identify and locate various important components of the refrigeration and air conditioning system	
		LO3	Represent various refrigeration and air conditioning processes using psychometric chart	
		LO4	Operate and maintain refrigeration system	
		LO5	Operate and maintain air conditioning system	
MEL605	DEPARTMENTA LEVEL ELECTIVE MTRX	LO6	Simulate VCRS	
		LO1	Demonstrate implementation of interfacing sensors and actuators using microcontrollers	
		LO2	Demonstrate of interfacing various utilities with microcontrollers	
		LO3	Demonstrate discrete control system using PLC microcontroller	
		LO4	Design and develop a control system for specific use	
		LO5	Implement program to PLC system and demonstrate its application	
SEM VI	MEC701	MD II	LO6	Develop pneumatic circuits for a specific system
			CO1	Select appropriate gears for power transmission on the basis of given load and speed
			CO2	Design gears based on the given conditions
			CO3	Select bearings for a given applications from the manufacturers catalogue.
			CO4	Select and/or design belts and flywheel for given applications
			CO5	Design cam and follower mechanisms.
	MEC702	CAD/CAM/CAE	CO6	Design clutches and brakes
			CO1	Identify proper computer graphics techniques for geometric modelling.
			CO2	Transform, manipulate objects & store and manage data.
			CO3	CAM Toolpath Creation and NC- G code output.
			CO4	Identify the tools for Analysis of a complex engineering component
			CO5	UNDERSTAND ROLE OF CAD/CAM IN CIM
	MEC703	PPC	CO6	Use rapid prototyping and tooling concepts in any real life applications.
			CO1	Illustrate production planning functions and manage manufacturing functions in a better way
			CO4	Develop competency in scheduling and sequencing of manufacturing operations
			CO2	Forecast the demand of the product and prepare an aggregate plan
			CO3	Develop the skills of Inventory Management and cost effectiveness
			CO5	Create a logical approach to Line Balancing in various production systems
	MEDLO7032	Automobile Engineering (Department level elective)	CO6	Implement techniques of manufacturing planning and control
			CO1	Illustrate the types and working of clutch and transmission system.
			CO2	Demonstrate the working of different types of final drives, steering gears and braking systems.
			CO3	Illustrate the constructional features of wheels, tyres and suspension systems
			CO4	Demonstrate the understanding of types of storage, charging and starting systems
			CO5	Identify the type of body and chassis of an automobile
	ILO7015	Operation Research (Institute level elective)	CO6	Comprehend the different technological advances in automobile
			CO1	Understand the theoretical workings of the simplex method, the relationship between a linear program and its dual, including strong duality and complementary slackness.
			CO2	Perform sensitivity analysis to determine the direction and magnitude of change of a model's optimal solution as the data change.
CO3			Solve specialized linear programming problems like the transportation and assignment problems, solve network models like the shortest path, minimum spanning tree, and maximum flow problems.	
CO4			Understand the applications of integer programming and a queuing model and compute important performance measures	
CO5			Solve Game theory problems to formulate competitive strategy	
MEL701	MD II	CO6	Solve Inventory control problems to optimize the order quantity of parts	
		LO1	Design gears based on the given conditions	
		LO2	Design gearbox for a given application	
		LO3	Design cam & followers for a given condition	
		LO4	Design clutches for a given application	
		LO5	Design brakes for given condition	
MEL702	CAD/CAM/CAE	LO6	Select bearings for a given applications from the manufacturers catalogue	
		LO1	Identify proper computer graphics techniques for geometric modelling	
		LO2	Transform, manipulate objects as well as store and manage data	
		LO3	Create CAM Toolpath and prepare NC- G code	
		LO4	Apply rapid prototyping and tooling concepts in any real life applications	
		LO5	Identify the tools for Analysis of a complex engineering component	
MEL703	PPC	LO6		
		LO1	To prepare a process sheet	
		LO2	To prepare a Gantt Chart	
		LO3	To forecast the demand of the product and prepare an aggregate plan.	
		LO4	To perform ABC analysis of a given problem	
		LO5	To develop the skills of Inventory Management and cost effectiveness.	
MEL704	PROJECT I	LO6	To create a logical approach to line Balancing for various production systems	
		LO1	Do literature survey/industrial visit and identify the problem	
		LO2	Apply basic engineering fundamental in the domain of practical applications	
		LO3	Cultivate the habit of working in a team	
		LO4	Attempt a problem solution in a right approach	
		LO5	Correlate the theoretical and experimental/simulations results and draw the proper inferences	

SEM VII	MEC801	DMS	LO6	Prepare report as per the standard guidelines.
			CO1	Understand and apply methodology and morphology of design
			CO2	Design material handling systems such as hoisting mechanism of EOT crane
			CO3	Design material handling systems such as hoisting mechanism of belt Conveyer
			CO4	Design engine componnets such as cylinder, piston, connecting rod and crankshaft from system design point of view
			CO5	Design pump for the given applications
	MEC802	IEM	CO6	Prepare layout of machine tool gear box and select number of teeth on each gear
			CO1	Illustrate the need for optimization of resources and its significance in manufacturing industries, in order to enhance overall productivity.
			CO2	Develop capability in integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products.
			CO3	Demonstrate the concept of value analysis and its relevance.
			CO4	Manage and implement different concepts involved in methods study and understanding of work content in different situations.
			CO5	Describe different aspects of work system design and facilities design pertinent to manufacturing industries.
	MEC803	POWER ENGINEERING	CO6	Identify various cost accounting and financial management practices widely applied in industries.
			CO1	Compute heat interactions in combustion of reactive mixtures
			CO2	Differentiate steam generators and steam turbines and calculate boiler/turbine efficiency and performance.
			CO3	Demonstrate working cycles of gas turbines
			CO4	Demonstrate working of jet propulsion engines
			CO5	Draw velocity triangles of impulse/reaction turbines and calculate performance parameters/efficiency
	MEDLO8043	Renewable Energy Systems (DEPARTMENT ELECTIVE)	CO6	Demonstrate basic working of pumps
			CO1	Demonstrate need of different renewable energy sources and their importance
			CO2	Calculate and analyse utilization of solar and wind energy
			CO3	Illustrate design of biogas plant
			CO4	Estimate alternate energy sources India
			CO5	Understand Energy Management
	ILO8029	Environmental Management (Institute Elective)	CO6	Understand Energy conservation
			CO1	Understand the concept of environmental management
			CO2	Understand ecosystem and interdependence, food chain etc.
			CO3	Understand and interpret environment related legislations
			CO4	
			CO5	
	MEL801	DMS	CO6	
			LO1	Apply the concept of System design
			LO2	Design of hoisting mechanism of EOT crane
			LO3	Design of belt conveyer system
			LO4	Design of pumps for the given specifications
			LO5	Design of engine components such as cylinder, piston, connecting rod and crankshaft
	MEL802	POWER ENGINEERING	LO6	Design of machine tool gearbox
			LO1	Differentiate boilers
			LO2	Differentiate boiler mountings and accessories
			LO3	Conduct a trial on impulse turbine and analyse its performance
			LO4	Conduct a trial on reaction turbine and analyse its performance
			LO5	Conduct a trial on Centrifugal pump and analyse its performance
	MEL803	PROJECT-II	LO6	Conduct a trial on Reciprocating pump and analyse its performance
			LO1	Do literature survey/industrial visit and identify the problem
			LO2	Apply basic engineering fundamental in the domain of practical applications
			LO3	Cultivate the habit of working in a team
			LO4	Attempt a problem solution in a right approach
			LO5	Correlate the theoretical and experimental/simulations results and draw the proper inferences
		LO6	Prepare report as per the standard guidelines.	