						SEMESTER 3

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
FLUID MECHANICS (011307)	CO1	To understand the fundamentals and applications of fluid mechanics	PO1,PSO1	U	C,P	4
	CO2	To Evaluate the forces on submerged plane and curve surfaces.	PO1,PO2, PSO1	E	C,P	6
	CO3	To Apply hydrostatic law, principle of buoyancy, stability of a floating body and conservation law in fluid mechanics	PO1, PO2, PSO1	Ap	C, P	9
	CO4	To Evaluate the discharge through fluid flow measurement devices	PO1,PO2, PSO1	E	C, P	10
	CO5	To evaluate the losses in a pipe flow network using Darcy- Weisbach, Moody's diagram and minor losses using hardy- cross method.	PO1,PO2,PSO1	E	C,P	9
	CO6	To Understand the flow separation, boundary layer flow and flow over immersed bodies	PO1,PSO1	U	C	8
						46

	CO No.	Course outcomes	POs/PSOs	CL	KC	Lab session
FLUID MECHANICS LAB (011307P)	CO1	To evaluate the metacentric height of floating body.	PO1,PO2,PSO1	An	C,p	3
	CO2	To Calculate the rate of discharge through notches.	PO1,PO2, PSO1	An	C,P	3
	CO3	To Apply the Bernoulli's theorem in a pipe flow	PO1, PO2, PSO1	Ap	C, P	3
	CO4	To Calculate the coefficient of discharge, contraction and velocity through an Orifice and Venturimeter.	PO1,PO2, PSO1	An	C, P	6
	CO5	To evaluate the Reynolds number a pipe flow.	PO1,PO2,PSO1	E	C,P	3
	CO6	To evaluate the coefficient of discharge through external mouthpiece.	PO1,PO2,PSO1	An	C,P	3
		Total				21

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
MATERIAL SCIENCE (021305)	CO1	To Analyze engineering materials on the basis of structure and properties for engineering applications	PO1, PSO1	An	C,P	5
	CO2	To Analyze the binary phase diagrams of alloys	PO1, PO2 PSO1	An	C, P	8
	CO3	To Understand the phase transformationreactions of Fe-Fe3C system.	PO1, PSO1	U	C	5
	CO4	To Apply the heat treatment processes that will produce a specified microstructure using isothermal transformation diagram for iron-carbon alloy	PO1, PO3, PSO1	Ap	C, P	6
	CO5	To Understand the properties of cast irons, steels and non-ferrous alloys	PO1, PSO1	U	F,C	9

	CO6	To Evaluate longitudinal and Transverse modulus for an aligned and continuous fiber reinforced composite	PO1, PO2, PSO1	E	C, P	9
						42
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
	CO1	Understand the Free Body Diagrams and establish equilibrium equations.	PO1, POS1	U, Ap	C, P	4
	CO2	Calculate forces, deflections, moments, stresses, and strains in the components subjected to tension, compression, torsion and bending, individually and in the combination of any of these.	PO1, PO2, PO3,POS1	E	C, P	6
STRENGTH OF MATERIALS (021306)	**CO3**	Understand the concepts of stress & strain at a point and the stress-strain relationships for linear, elastic, homogeneous & isotropic material.	PO1, POS1	U	C	10
	CO4	Determine the principal stresses, maximum shearing stresses, and the stresses acting on any arbitrary plane within a structural element.	PO1, PO2, POS1	E	C, P	15
	CO5	Predict the failure of the mechanical components using theories of failure	PO1, POS1	E, Ap, An	C, P	10
	CO6	Determine the stresses and strain involved in thin and thick cylinder	PO1, PO2, PSO1	E	C, P	5
						45
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Lab session**
	CO1	To Understand the procedure to perform an experiment	PO1, PPOS1	U, Ap	C, P	6
	CO2	To Calculate forces, deflections, and strains in the component by appropriate instruments.	PO1, PO2, POS1	E	C, P	6
STRENGTH OF MATERIALS LAB (021306P)	**CO3**	To Apply the concepts of stress& strain at a pointto plot the stress-strain relationship curve.	PO1, POS1	U	C	3
	CO4	To Determine the hardness of the different materials.	PO1, PO2, POS1	E	C, P	6
	CO5	To Evaluate the amount of the error in the different experiments	PO1, POS1	E, Ap, An	C, P	6
						27
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
	CO1	To Understand the behaviour affecting the organizations.	PO8,PO9,PSO2	U	C	5
	CO2	To Analyze the factors that contribute to the individual behavior.	PO8,PO9,PO10,PSO2	An	C,P	10
ORGANISATIONAL BEHAVIOR AND INDUSTRIAL PHSYCOLOGY (241301)	**CO3**	To Analyze the factors that contribute to the dynamics and effectiveness of a group and team.	PO9,PO10,PSO2	An	C,P	6
	CO4	To Understand the approaches in the leadership to manage power and politics of an organization.	PO8,PO11,PSO2	U	C	5
	CO5	. To Understand the structure and culture prevalent in an organization.	PO6,PSO2	U	C	7
	CO6	To Apply the changes for effectiveness and continuous development of an organization	PO12,PSO2	Ap	C,P	8
						41

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
THERMODYNAMICS(021307)	CO1	To Understand the thermodynamic systems and its boundaries	PO1,PSO1	U	C	3
	CO2	To Apply the first law of thermodynamics for steady and unsteady flow processes	PO1,PO2, PSO1	Ap	C,P	5
	CO3	To Analyze the second law of thermodynamics and principle of entropy	PO1,P02, PSO1	An	C,P	11
	CO4	To Determine and Analyze properties of ideal gases and properties of steam using steam table	PO1,PO2, PSO1	An	C,P	6
	CO5	To Analyze the performance of air standard cycles and vapour cycles	PO1,PO2,P03, PSO1	An	C,P	12
	CO6	To Understand psychrometric processes using psychrometric chart	PO1, PSO1	U	C	5
						42

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
MATHEMATICS III(211303)	CO1:	To Understand the application of partial differential equations in engineering like heat equation, wave equation and Laplace equation.	PO1, PO2, PO3, PO4,PSO2	U, E	C	11
	CO2:	To Able to apply the concept of correlation, moments, skewness, kurtosis , curve fitting and probability distribution.	PO1, PO3, PO5,PSO2	Ap, E	P	7
	CO3:	Able to describe and analyze the probability and statistic in engineering application.	PO1, PO2, PO5,PSO2	U, An	C	7
	CO4:	Able to apply applications of partial differential equations and probability in various fields of Mathematics and Physics.	PO1, PO2, PO3, PO4,PSO2	Ap, E	P	7
	CO5:	Able to understand the concept of Algebraic Structures like Group Theory and Graph Theory.	PO1, PO2, PO3, PO5,PSO2	U	C, P	7
	CO6:	Able to create mathematical modeling of natural problems in the different Engineering applications by using special functions like Legendre's and Bessel's functions.	PO1, PO2, PO3, PO4,PSO2	C, E	C,P	5
						44

SEMESTER 4						
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
BASIC ELECTRONICS(041401)	CO1	To understand the basics of semiconductor devices.	PO1, PSO2	U	C	10
	CO2	To analyze different diode circuits.	PO1, PSO2	An	C,P	7
	CO3	To analyze biasing techniques of BJT.	PO1, PSO2	An	C,P	10
	CO4	To understand principle of operation and different parameters of FET.	PO1, PSO2	U	C	7
	CO5	To analyze OPAMP circuits.	PO1, PSO2	An	C,P	5
	CO6	To understand the working principle and application of SCR and UJT.	PO1, PSO2	U	C	3
						42
	CO No.	Course outcomes	POs/PSOs	CL	KC	Lab session

	CO No.	Course outcomes	POs/PSOs	CL	KC	
BASIC ELECTRONICS LAB(041401)	CO1	To understand different instruments.	PO1,PSO2	U	C	2
	CO2	To analyze the characteristics of different semiconductor diodes.	PO1,PSO2	An	C	2
	CO3	To analyze the different diode circuits.	PO1,PSO2	An, E	C	2
	CO4	To analyze the characteristics of BJT.	PO1,PSO2	An	C	2
	CO5	To analyze the characteristics of JFET.	PO1,PSO2	An	C	2
	CO6	To analyze OPAMP circuits.	PO1,PSO2	An	C	2
						12

	CO No.	Course outcomes	POs/PSOs	CL	KC	LAB
KINEMATICS OF MACHINARY (021408)	CO1	To Analyse the inversion of mechanism and different types of motion when corresponding link is fixed.	PO1,PSO1	An	C	6
	CO2	To Understand the different types of mechanism with lower pairs and higher pairs and its application.	PO1,PSO1	U	C	6
	CO3	To Analyse position, velocity and acceleration of links of different mechanisms	PO1,PO2,PSO1	An	C,P	7
	CO4	To Analyse the gear profiles and gear trains.	PO1,PSO1	An	C,P	5
	CO5	To Understand the braking system; power Transmission through clutches and balancing of Revolving mass.	PO1,PO2, PSO1	U	C	8
	CO6	To Analyse the working of governors and its application.	PO1,PSO1	An	C,P	8
						40

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
MANUFACTURING BY SHAPING AND JOINING (021409)	CO1	To Analyze the specific casting processes for engineering materials	PO1, PSO1	An	C	9
	CO2	To Design the casting mold,sprue, riser and gates for casting of engineering materials	PO1, PO2, PSO1	An, Ap	C, P	6
	CO3	To Understand the forming processes of materialsfor industrial applications	PO1, PSO1	U	C	8
	CO4	To Understand the manufacturing of components using powder metallurgy	PO1, PSO1	U	C	4
	CO5	To Understand the conventional and non-conventional welding processes	PO1, PSO1	U	C	6
	CO6	To Apply the suitable welding process for engineering materials	PO1, PO2, PSO1	Ap	C,P	9
						42

	CO No.	Course outcomes	POs/PSOs	CL	KC	Lab session
MANUFACTURING BY SHAPING AND JOINING (021409P)	CO1	To create butt and lap joint using arc welding	PO1,PSO1	C	C,P	12
	CO2	To apply sheet metal techniques for box formation	PO1,PSO1	Ap	C,P	6
	CO3	To apply moulding techniques for patterns	PO1,PSO1	Ap	C,P	6
	CO4	To Create a gear using millimg machine	PO1,PSO1	C	C,P	6
	CO5	To apply machining processes on mild steel rod.	PO1,PSO1	Ap	C,P	6
						36
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
NUMERICAL METHODS AND COMPUTATION TECHNIQUES(211404)	**CO1:**	Able to apply machine language, computer algorithm, C/C++ programming in NMCT.	PO1, PO2, PO3, PO4,PSO2	Ap,	C, P	6
	CO2:	Able to Evaluate the solution of algebraic and transcendental equations using iterative approximations techniques.	PO1, PO3, PO4 ,PSO2	A, C, E	C, P	4
	CO3:	To Understand the concept of finite difference methods with different operators on equal and unequal intervals.	PO1, PO3, PO5,PSO2	U, E	P	3
	CO4:	Able to analyze the concept of data analysis by various interpolation methods.	PO1, PO2, PO3,PSO2	An, E	P	4
	CO5:	Able to apply Numerical differentiation and various numerical integration methods to find the solutions of complex problems.	PO1, PO2, PO3, PO4,PSO2	Ap, E	C, P	6
	CO6:	Able to determine the solution for ordinary/ partial differential equations with initial and boundary conditions.	PO1, PO2,PO3,[PSO2	An, E	C, P	4
						27
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
NUMERICAL METHODS AND COMPUTATION TECHNIQUES LAB(211404)	CO1:	Able to apply machine language, computer algorithm and flowchart C/C++ programming in NMCT.	PO1, PO2, PO3	Ap, U	F,C	3
	CO2:	Understand fundamentals and concepts of statistical and optimization in particular, with programming should include numerical as well as non-numeric applications, matrix operations, searching , sorting.	PO1, PO4	U,An	C, P	6
	CO3:	Analyze problems and solve theory of probability, linear programming problems, transportation, assignment.	PO1, PO4, PO5	An, E	P	3
	CO4:	Determine Important theorems, different formulae and practical applications of these statistical and optimization methods in the field of computer Sciences and Applications.	PO2, PO3,PO4,	An, E	C, P	8
						20
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
OBJECT ORIENTED PROGRAMING(051401)	**CO1**	To Analyze object-oriented paradigm with concepts of streams, classes, functions, data and objects.	PO1,PO2,PO3,PO4,PO5,PSO2	U	C,P	8
	CO2	To Understand dynamic memory management techniques using pointers, constructors, destructors, etc	PO1,PO2,PO3,PO4,PSO2	U	C	6
	CO3	To Apply the concept of function overloading, operator overloading, virtual functions and polymorphism.	PO1,PO2,PO4,PO5,PSO2	Ap	C,P	8
		To Analyze inheritance with the understanding of early and late binding,	PO1,PO2,PO4,PO	E	C,P	6

	CO4	usage of exception handling, generic programming.	5,PSO2		C,P	
	CO5	Demonstrate the use of various OOPs concepts with the help of programs.	PO1,PO2,PO4,PO5,PSO2	Ap	C,P	8
	CO6	Analyze problems and solve them using Object Oriented Programming approach.	PO1,PO2,PO4,PO5,PO12,PSO2	An	C.P	6
						42

	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
	CO1:	To understand the features of C++ supporting object-oriented programming	PO1,PO2,PO3,PO4,PO5,PSO2	U	C,P	4
OBJECT ORIENTED PROGRAMING(051401P)	**CO2:**	TO apply simple program based on object-oriented concept using Classes	PO1,PO2,PO3,PO4,PSO2	Ap	C,P	2
	CO3:	To apply advanced concept of encapsulation, inheritance and polymorphism in C++	PO1,PO2,PO4,PO5,PSO2	Ap	C,P	2
	CO4:	TO create template classes for generalized solution of problems	PO1,PO2,PO4,PSO2	C	C,P	2
						10

Semester 5						
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
	CO1	To Understand dynamics of plane motion of a rigid body, correction torque and forced in mechanism and machines	PO1, PSO1	U	C	3
DYNAMICS OF MACHINERY (021513)	**CO2**	To Analyse the turning moment diagram of crank shaft and flywheel.	PO1,PO2,PSO1	AP,AN	C, P	3
	CO3	To Analyze the follower motions and draw cam profiles.	PO1,PO2,PSO1	AP, AN	C,P	8
	CO4	To Analyze stabilization of sea vehicles, aircrafts and automobile.	PO1,PO2,PSO1	AP, AN	C,P	8
	CO5	To Determine the unbalanced forces in a multi-cylinder reciprocating engine	PO1,PO2,PSO1	E	C,P	10
	CO6	To Analysis of vibration systems with desired Conditions using the general equation of displacement.	PO1, PO2,PO3,PSO1	AP, AN	C,P	14
						46

	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Lab Session**
	CO1	To analyze the static and dynamic balancing of revolving masses	PO1,PO2, PSO1	AP,AN	C, P	3
DYNAMICS OF MACHINERY LAB (021513P)	**CO2**	To analyze the motorised gyroscope and coriolis component	PO1,PO2,PSO1	AP,AN	C, P	6
	CO3	To analyze the motion and profiles of cam.	PO1,PO2,PSO1	AP, AN	C,P	3
	CO4	To evaluate the natural frequency of a system	PO1,PO2,PO3,PSO1	E	C,P	3
	CO5	To analyze the working of governers	PO1,PO2,PSO1	AP, AN	C,P	3

	CO6	To evaluate critical speed for different arrangement of shafts	PO1, PO2,PO3,PSO1	E	C,P	3
						21
FLUID MACHINERY (021510)	**CO No.**	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
	CO1	To Understand various types of turbo machinery	PO1	An	C	5
	CO2	To Apply the Euler's equation for turbomachinery to analyze energy transfer in turbomachines	PO1, PSO1	Ap, An	C, P	2
	CO3	To Apply the preliminary design of turbomachines (pumps, rotary compressors and turbines) and visualize dimensional analysis.	PO1, PO3, PSO1	U,Ap	C, P	3
	CO4	To analyze the working of Pelton, Francis and Kaplan turbines along with their performance parameters.	PO1, PSO1	U,An	C, P	5
	CO5	To analyze the operation and performance parameters of Positive displacement pumps, Rotodynamic pumps and air compressors	PO1, PSO1	U,An	C, P	22
	CO6	To design and plan hydroelectric power plant with the available water resources and requirement of power	PO1, PO3, PSO1	E, C	C, P	5
						42
FLUID MACHINERY LAB (021510P)	**CO No.**	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Lab Session**
	CO1	To Understand various types of turbo machinery	PO1	An	C	3
	CO2	To analyze the working of Pelton, Francis and Kaplan turbines along with their performance parameters.	PO1, PSO1	U,An	C, P	9
	CO3	To analyze the operation and performance parameters of Positive displacement pumps, Rotodynamic pumps and air compressors	PO1, PSO1	U,An	C, P	9
						21
MACHINE TOOLS AND MACHINERY (021514)	**CO No.**	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
	CO1	To Evaluate the cutting forces and power required for orthogonal cutting by using Merchant's circle diagram.	PO1, PO2, PSO1	E	CP	6
	CO2	To Determine the cutting parameters for improving tool life and reducing tool wear used for orthogonal cutting.	PO1, PO3, PSO1	E	CP	6
	CO3	To Understand machining operations and corresponding machine tools for specific application in real time.	PO1, PSO1	U	C	12
	CO4	To Understand the part programming for CNC machining	PO1, PO5, PSO1, PSO3	U	C	10
	CO5	To Determine the dimensional and geometrical features of a given component.	PO1, PO2, PSO1	E	CP	4
	CO6	To Understand the locating, clamping and designing principle of jigs and fixtures	PO1, PSO1	U	C	4
						42
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
PERSONAL MANAGEMENT & INDUSTRIAL RELATIONS (241502)	CO1	To Understand the PM system at various levels in general and in certain specific industries or organizations.	PO6,PSO2	U	F	6
	CO2	To Analyse the issues and strategies required to select and develop manpower resources	PO1,PSO2	An	C,P	9
	CO3	To Develop the relevant skills necessary for application in PMIR related issues	PO1,PSO2	U,Ap,	C	9
	CO4	Enable the students to integrate the PM understanding of various concepts along with the domain concept in order to take correct business decisions	PO1,PSO2	An	F	6
	CO5	To Apply the essential concepts of industrial relations and their interrelationship at the personal, organisational and national levels.	PO8.PSO2	Ap	C	6
	CO6	Understand industrial relations problems like 5 R policy of India and role of three actors	PSO2	U	C	6
						42
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
STEAM POWER SYSTEM (021512)	CO1	To Analyze the power plants based on rankine cycle and their modifications.	PO1,PO2, PSO1	An	C,P	5
	CO2	To Analyze suitable boilers according to their specifications and usage.	PO1,PSO1	Ap	C	7
	CO3	To Understand the constructional details of boiler with furnace specifications.	PO1, PSO1	U	F,C	7
	CO4	To Analyze the performance of steam turbines and effects of compounding, reheat, regeneration and governing.	PO1, PO2, PO3, PSO1	An	C,P	12
	CO5	To evaluate the flow area of nozzles with effects of friction and divergence.	PO1, PO2, PO3, PSO1	E	C,P	5
	CO6	To Understand the working of a steam condenser.	PO1, PSO1	U	C,P	6
						42
	CO No.	Course outcomes	POs/PSOs	CL	KC	Lab Session
STEAM POWER SYSTEM LAB (021512P)	CO1	To understand the constructional details of boilers.	PO1,PSO1	An	F,C	12
	CO2	To analyze the boilers on the basis of furnace, inclination and firing methods.	PO1,PO2,PSO1	An	C,P	6
	CO3	To analyze the turbines on the basis of energy conversion .	PO1,PO2,PSO1	An	C,P	6
	CO4	To evaluate the power of a steam turbine.	PO1,PO5,PSO1	E	C,P,Cr	6
	CO5	To Evaluate the performance parameters of a double stage air compressor.	PO1,,PO3,PO7,PSO1	E	C,P	6
						36
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
	CO1	To Apply single key techniques like Playfair cipher and Hill-cipher to encrypt and decrypt the message.	PO1,PO3,PO4,PO9,PO12,PSO1,PSO2.	R,U,AP	C	10

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
INFORMATION SECURITY (061505)	**CO2**	To Apply public key cryptographic techniques like Diffie- Hallman and RSA to encrypt and decrypt the message	PO1,PO2,PO8,PO9,PO12,PSO2.	R,U,AP	C	6
	CO3	To Analyze various authentication methods like Captcha and Kerberos.	PO3,PO5,PO6,PO8,PSO1.	An	C,P	6
	CO4	To Determine the root cause of various software flaws by showing missing commands,missing URL, logical errors	PO1,PO5,PO9,PO10,PO12,PSO1,PSO2.	E	P	10
	CO5	To Apply various tools for password recovery like Brutus, Cain and Abel etc.	PO1,PO6,PO7,PO10,PO11,PO12,PSO1,PSO3.	E	C	6
	CO6	To Apply firewall and IDS to ensure data security.	PO10,PO11,PO12,PSO3	C	P	4
						42

Semester 6						
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
COMPETITIVE MANUFACTURING STRATEGIES(021618)	**CO1**	To Understand the policies that affect the trade and the competitive environment in the manufacturing sector	PO6,PSO2	U	F	6
	CO2	To Analyze suitable manufacturing systems to be used for production in order to compete in the competitive market.	PO1,PO2,PSO2	Ap, An	C,P	14
	CO3	To apply the processes adopted to improve quality.	PO1,PSO2	Ap	C,P	12
	CO4	To Understand latest technologies in manufacturing sector for achieving excellence.	PO1	U	C	4
	CO5	To Understand Pull and Push system of manufacturing.	PO1,PSO2	U	C	4
						40
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom Session
DESIGN OF MACHINE ELEMENTS(021615)	**CO1**	To Understand the customers' need, formulate the problem and draw the design specifications.	PO1, POS1	Ap	C, P	4
	CO2	To design a machine element under the static & cyclic loading.	PO1, PO2, POS1	U	C, P	10
	CO3	To Understand design data books in designing mechanical components.	PO1, POS1	Ap	C	2
	CO4	To Apply the concepts of principal stresses, theories of failure, stress concentration and the fatigue failure criteria.	PO1, PO2, POS1	Ap	C, P	15
	CO5	To analyze appropriate materials in design considering its engineering properties, cost and weight.	PO1,PO3, POS1	E,	C, P	5

	CO No.	Course outcomes	POs/PSOs	CL	KC	
	CO6	To Design keys, cotters and knuckle joints including riveted, bolted and welded joints.	PO1, PO2, PSO1	E	C, P	12
						48
DESIGN OF MACHINE ELEMENTS LAB (021615P)	CO No.	Course outcomes	POs/PSOs	CL	KC	Lab Session
	CO1	To Understandthe problem and draw the design specifications.	PO1, PPOS1	U, Ap	C, P	3
	CO2	To Understand the design procedure of a machine element under the static & cyclic loading.	PO1, PO2, POS1	U	C, P	6
	CO3	To understand design data books in designing mechanical Components.	PO1, POS1	Ap	C	3
	CO4	To Design and draw keys, cotters and knuckle joints including riveted, bolted and welded joints.	PO1, PO2, POS1	Ap	C, P	9
	CO5	To Create the drawings of the machine elements.	PO1, POS1	E, Ap, An	C, P	3
						24
HEAT AND MASS TRANSFER (021616)	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
	CO1	To Evaluate heat transfer rate and temperature distribution for steady and unsteady state.	PO1,PO2,PSO1	Ap,E	C,P	13
	CO2	To Evaluate heat transfer through extended surfaces.	PO1,PO2, PSO1	E	C,P	4
	CO3	To Analyze the natural and forced convection parameters for internal and external flow.	PO1,P02, PSO1	An	C,P	10
	CO4	To Determine the effectiveness of heat exchanger by using LMTD and NTU method.	PO1,PO2, PO3,PSO1	E	C,P	5
	CO5	To Evaluate radiative heat transfer rate and shape factor for black and grey bodies	PO1,PO2,PSO1	An,E	C,P	6
	CO6	To Understand the phenomenon of diffusion mass transfer	PO1, PSO1	U	C	4
						42
HEAT AND MASS TRANSFER LAB (021616P)	CO No.	Course outcomes	POs/PSOs	CL	KC	Lab Session
	CO1	To evaluate heat transfer rate of a composite plate and a cylindrical rod	PO1,PO2,PSO1	Ap,E	C,P	6
	CO2	To evaluate heat transfer rate through pin fin	PO1,PO2, PSO1	Ap,E	C,P	3
	CO3	To evaluate heat transfer rate of a metallic rod in free and forced convection	PO1,PO2,P03, PSO1	,Ap,E	C,P	6
	CO4	To evaluate the effectiveness of heat exchanger by using LMTD and NTU method	PO1,PO2,PSO1	Ap,E	C,P	6
	CO5	To evaluate emissivity of a given grey body	PO1,PO2,PSO1	Ap,E	C,P	3
						24
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
NON CONVENTIONAL MANUFACTURING (021617)	CO1	To Understand the need of various Non-conventional Manufacturing Processes	PO1, PSO1	U	C	2
	CO2	To Analyse the role of mechanical energy in non-conventional manufacturing processes.	PO1, PSO1, PSO3	An	C	9
	CO3	To Analyse the role of thermo-electrical energy in non-conventional manufacturing processes	PO1, PO2, PO3, PO5. PSO1, PSO3	An	C, P	16
	CO4	To Understand the concept of manufacturing the materials using chemical energy and electrochemical energy.	PO1, PO2, PO5, PSO1, PSO3	U	C	3
	CO5	To Understand the high pressure energy based non-Conventional manufacturing processes.	PO1, PO5, PSO1, PSO3	U	C	12
						42
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
INDUSTRIAL ECONOMICS AND ACCOUNTANCY (241606)	CO1	To Understand central problems of economics and laws of Demand	PO1, PSO2	U	C	8
	CO2	To Understand characteristics of factors of production. .	PO6, PSO2	U	C	5
	CO3	ToApply laws of variable proportion and law of return to scale	PO9,PO11, PSO2	Ap	F,P	4
	CO4	To Analyze short run and long run cost curves for perfect competition,monopoly, monopolistic competition and monopsony market condition	PO11,PSO2	An	C,P	8
	CO5	To evaluate economic value and compare results using, Present worth method, future worth method and IRR methods.	PO11,PSO2	E	F,P	7
	CO6	To Understand accounting concepts and record keeping in journal and ledgers.	PO9,PO11, PSO2	U	c	8
						40
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
INSTRUMENTATION AND MEASUREMENT (021619)	CO1	To Analyse the constructional and operational aspects of different electro-mechanical measuring instruments along with their application domains.	PO1, PO2,PSO2	An	C,P	8
	CO2	To Analyse statistical data and evaluation from static and dynamic characteristics including errors of different electro-mechanical instruments.	PO1, PO2,PSO2	An	C,P	8
	CO3	To Understand the principle of transduction, classifications and the characteristics of transducers and its applications.	PO1,PSO2	U	C	10
	CO4	To Understand the types of logic circuits and microprocessor on the basic knowledge of digital electronics..	PO1,PSO2	U	C,P	6

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
	CO5	To Understand the components of data acquisition system and explain various data transfer techniques.	PO1, PSO2	U	C	4
	CO6	To Understand types of signals and classify them, analyse them, and perform various operations on them	PO1,PSO2	U	C	4
						40

Semester 7						
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
COMPUTER AIDED DESIGN & MANUFACTURING (021730)	CO1	To Understand advantages and diadvantages of Automation	PO1, PSO1	U	C,F	4
	CO2	To Write part programming for a given job profile	PO1, PO5, PSO1	Ap	C,P	8
	CO3	To Apply translation and rotation methods of a one dimensional, two dimensional and three dimensional geometrical shape	PO1, PO2, PSO1	Ap	C,P	8
	CO4	To Apply CAD/CAM technology for finite element data preparation	PO1, PO5, PSO1	Ap	C,P	6
	CO5	To analyze NC, CNC, DNC programming on the basis of their features, advantages and disadvantages	PO1, PSO1	An	C,F	8
	CO6	To Understand applications, advantages and types of Automated Guided Vehicles	PO1, PSO1	U	C,F	6
						40
	CO No.	Course outcomes	POs/PSOs	CL	KC	**Lab Session**
COMPUTER AIDED DESIGN & MANUFACTURING LAB (021730P)	CO1	to create a part program for machining operations.	PO1,PO3,PSO3	C	C,P	6
	CO2	to create a geometry statement of given dimensions.	PO1,PO3,PSO1	C	C,P	6
	CO3	to create APT program for maching operations	PO1,PO3,PSO3	C	C,P	6
						18
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
AUTOMOTIVE MECHANICS(021724)	CO1	To Develop the competencies in operation of automobiles, Preventive maintenance and automobile safety	PO1,PO6	An	C	4
	CO2	To Understand the principle of transmission, lubrication system and fuel supply system.	PO1,PSO1	U	C	11
	CO3	To evaluate performance parameters of carburetor and clutch.	PO1,PO2,PO3, PSO1	E	C,P	3
	CO4	Understand the functioning of steering system, braking systems, suspension and ignition system.	PO1, PSO1	U	C	14
	CO5	Determine the effect of brakes in automobile and performance of engine.	PO1,PO2, PO3 PSO1	Ap	C,P	2
	CO6	To Understand about pollution due to vehicles emission, testing of vehicles and handling characteristics.	PO6,PO7	U	C	8

						42
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
I C ENGINE & GAS TURBINE (021722)	**CO1**	To Analyze different types of reciprocating internal combustion engines on the basis of their performance characteristics.	PO1,PSO1	An	C,P	6
	CO2	To understand the main components of exhaust emissions and explain the theory of combustion with effects of supercharging and lubrication	PO1,PO7, PSO1	U	C	10
	CO3	To Understand the properties of fuels and concept of AFR.	PO1,PSO1	U	C	3
	C04	To Design the jet for injection of fuel.	PO1,PO2,PO3,PSO1	E	C,P	6
	CO5	To Analyze performance characteristics of gas turbines.	PO1,PO2,PSO1	An	C,P	10
	CO6	To Understand the principles and dynamics behind jet & rocket propulsion	PO1,PSO1	U	C	7
						42
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Lab Session**
I C ENGINE & GAS TURBINE (021722P)	**CO1**	To analyze the components and working of 2 stroke diesel and petrol engine based on valve timing diagram	PO1,PO2,PSO1	An	F,C,P	6
	CO2	To analyze the components and working of 4 stroke diesel and petrol engine based on valve timing diagram	PO1,PO2,PSO1	An	C,P	6
	CO3	To evaluate the performance parameters of multi cylinder 4 stroke petrol engine	PO1,PO3,PSO1	E	C,P,Cr	6
	CO4	To evaluate the performance parameters of single cylinder 4 stroke diesel engine	PO1,PO3,PSO1	E	C,P,Cr	6
	CO5	To evaluate the heat balance sheet for Single cylinder 4 stroke diesel engine	PO1,,PO3,PO7,PSO1	E	C,P,Cr	6
	CO6	To evaluate the heat balance sheet for multi cylinder 4 stroke petrol engine	PO1,PO3,PO7,PSO1	E	C,P,Cr	6
						36
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
OPERATION RESEARCH(021723)	**CO1**	To Understand the scope and application of Operation Research.	PO11,PSO2	U	C	2
	CO2	To evaluate the optimum solution for system of linear equationsusing graphical and analytical methods	P01,P03,PSO2	E	C,P	4
	CO3	To evaluate the optimum location using transportation and assignment model	P01,P03,PSO2	E	C,P	4
	CO4	To Apply the Probabilistic and deterministic model to industrial project.	PO2,PO11,PSO2	Ap	C,P	10
	CO5	To Analyze the Inventory Model and queening theory	PO1,PO11,PSO2	An	C	9
	CO6	To Determine the sequence of operations for industrial processess	PO1,PSO2	E	C,P	5
						34
	CO No.	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**

	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
REFRIGERATION AND AIR CONDITIONING (021720)	CO1	To Understand the basic concepts of refrigeration and air conditioning systems	PO1, PSO1	U	C	6
	CO2	To Apply vapour compression refrigeration system concept and identify methods for performance improvement.	PO1,PO2,PSO1	AP,AN	C, P	9
	CO3	To Analysis of air, vapour absorption, thermoelectric and steam-jet refrigeration systems..	PO1,PO2,PSO1	AP,AN	C, P	9
	CO4	To Understand the properties of refrigerants, refrigerant leakage detection methods and refrigerating equipments.	PO1,PO2,PSO1	AP, AN	C,P	5
	CO5	To Evaluate cooling load for air conditioning systems used for various applications	PO1,PO2,PSO3,PSO1	AP, AN	C,P	6
	CO6	Able Use P-h, T-S and Psychrometric charts to solve refrigeration and Air conditioningdesign problems	PO1,PO2,PO3,PSO1	E	C,P	10
						45
	CO No.	Course outcomes	POs/PSOs	CL	KC	Lab Session
REFRIGERATION AND AIR CONDITIONING (021720P)	CO1	To evaluate performance refrigerator usingMollier charts and/ or refrigerant property tables.	PO1, PO2, PO3,PSO1	AP,AN	F,C,P	9
	CO2	To analyse the basic air conditioning processes on psychometric charts, calculate cooling load for its applications in comfort and industrial air conditioning	PO1,PO2,PO3,PSO1	AP,AN	F,C, P	6
	CO3	Apply the various equipment-operating Principles, operating and safety controls employed in refrigeration air conditioning systems	PO1,PO2,PO3,PSO1	AP,AN	F,C, P	6
	CO4	Evaluate the performance of cascade low temperature refrigeration upto -50° C	PO1,PO2,PO3,PO5,PSO1	AP, AN	F,C,P	3
						24
Semester 8						
INDUSTRIAL POLLUTION(021827	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
	CO1	To Understand of ecosystem and its environment	PO6,PO7,PSO2	U	F	4
	CO2	To Understand of natural and man-made hazards and related safety issues	PO6,PO7,PSO2	U	F	4
	CO3	To Analyse the sources of air and noise pollution	PO6,PO7,PSO2	An	F	8
	CO4	To analyse the sources of solid and hazardous wastes and manage them.	PO6,PO7,PSO2	An	F,P	6
	CO5	To understand the various processes involved in Waste water treatment	PO1,PO6,PO7,PSO2	U	P	6
	CO6	To Understand the concepts involved in control technologies	PO1.PO6,PO7,PSO2	U	P	12
						40
	CO No.	Course outcomes	POs/PSOs	CL	KC	Classroom session
	CO1	To Formulate the problem and draw the design specifications.	PO1, POS1	U, Ap	C, P	2

	CO No.	Course outcomes	POs/PSOs	CL	KC	
MECHANICAL SYSTEM DESIGN (021821)	**CO2**	Use the material data obtained from standard mechanical testing methods for Mechanical system design applications.	PO1, PO2,PO3 POS1	U	C, P	2
	CO3	To Design the cylinder, connecting rod, crank shaft and valve gear of an IC engine.	PO1, PO3POS1	Ap	C	10
	CO4	To Design the gears (spur and helical) & gear boxes.	PO1, PO2,PO3 POS1	Ap	C, P	6
	CO5	To Design the flywheel, bearings, chain drive and brackets for different applications.	PO1,PO3 POS1	E	C, P	12
	CO6	To Design the mechanical systems like centrifugal pump and hydraulic press.	PO1,PO3 POS1	E	C, P	8
						40
MECHANICAL SYSTEM DESIGN (021821P)	**CO No.**	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Lab Session**
	CO1	Understand the problem and draw the design specifications.	PO1, PPOS1	U, Ap	C, P	3
	CO2	Use the material data obtained from standard mechanical testing methods for Mechanical system design applications.	PO1, PO2, POS1	U	C, P	3
	CO3	Design and drawthe cylinder, connecting rod, crank shaft and valve gear of an IC engine.	PO1, POS1	Ap	C	9
	CO4	Design and drawthe gears (spur and helical) & gear boxes.	PO1, PO2, POS1	Ap	C, P	6
	CO5	Design and draw the flywheel, bearings, chain drive and brackets for different applications.	PO1, POS1	E, Ap, An	C, P	6
	CO6	Design and draw the mechanical systems like centrifugal pump and hydraulic press.	PO1, POS1	E, Ap, An	C, P	6
						33
SUSTAINABLE DEVELOPMENT (241807)	**CO No.**	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
	CO1	To understand the balance that nature maintains in theecosystem and the biosphere	PO7	U	C	11
	CO2	To Analyze the aspects of environment.	PO7	An	C,P	5
	CO3	To Understand the concerns of biodiversity and suitably apply precautions for sustainability.	PO7,PO8,PO12	Ap	C	5
	CO4	To Understand GNP through cost benefit analysis and monetary evaluation.	PSO2	U	C	9
	CO5	To Analyze the effects of free trade and globalization to environment.	PO7	An	C,P	8
	CO6	To Understand the strategic approaches and laws prevalent to sustainable development	PO7	U	C	4
						42
MANAGEMENT	**CO No.**	**Course outcomes**	**POs/PSOs**	**CL**	**KC**	**Classroom session**
	CO1	To Understand the strategic and challenges in E- business	PO6,PSO2	U, An	F	6
	CO2	To Understand application of MIS in E-business and manufacturing sector.	PO6,PSO2	U	C,P	12

INFORMATION SYSTEM(061822)	CO3	To Able to understand Management system and analysis, design and business processes, Re-Engineering	PO6,PSO2	U	C	12
	CO4	To Case studies of tata home finance Ltd. And Engineering products limited.	PO6,PO11, PSO2	An	F	4

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