

Government College of Engineering, Salem - 11
Department of Mechanical Engineering
COs - POs and PSO Mapping
Course Articulation Matrix – 22 Regulation

Semester-I																
22MA101 - Matrices, Calculus and Ordinary Differential Equation																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Learn the fundamental knowledge of Matrix theory.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
2	Use both the limit definition and rules of differentiation to differentiable functions.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
3	Apply differentiation to solve maxima and minima problems.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to a change of order and change of variables.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
5	Apply various techniques in solving differential equations.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
Average		3	2	-	2	-	-	-	-	-	-	-	-	2	-	-

Semester-I																
22CY101 - Engineering Chemistry																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Recall the basic principles of spectroscopy and their applications	3	3	-	3	-	-	-	-	-	-	-	-	3	1	1
2	Paraphrase the different methods for water analysis & purification and Nanomaterial & its applications	3	2	-	1	-	2	-	-	-	-	-	-	3	1	1
3	Apply the various adsorption techniques and basic knowledge of Phase equilibria	3	1	-	1	-	-	-	-	-	-	-	-	2	1	1
4	Integrate the principles of electrochemistry, electrochemical cells, corrosion, and its control	2	1	-	1	-	2	-	-	-	-	-	-	2	3	2
5	Assess the basis of polymer preparations & applications and enhancement of the quantity & quality of fuels.	3	2	-	3	-	2	-	-	-	-	-	-	1	1	1
Average		2.8	1.8	-	1.8	-	2	-	-	-	-	-	-	2.2	1.4	1.2

Semester-I																	
22EE101 - Basic Electrical And Electronics Engineering																	
Course Outcomes		Program Outcomes												Program Specific Outcomes			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1	Analyze the DC circuits using fundamental laws and theorems.	1	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-
2	Analyze the single and three phase AC circuits.	1	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-
3	Recognize the working principle of electrical machines and transformers.	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
4	Recognize the fundamentals and characteristics of diode, BJT and operational amplifier.	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
5	Demonstrate the concept of electrical installations.	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
Average		1	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-

Semester-I																
22ME101 - Engineering Graphics and Design																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Familiarize with the fundamentals and standards of engineering graphics.	3	1	-	-	-	-	-	-	-	-	-	-	3	1	-
2	Ability to understand the fundamental concepts of projection of points, lines and planes.	3	1	-	-	-	-	-	-	-	-	-	-	3	1	-
3	Project the solids and section of solids.	3	1	-	-	-	-	-	-	-	-	-	-	3	1	-
4	Familiarize and develop the lateral surfaces of solids	3	1	-	-	-	-	-	-	-	-	-	-	3	1	-
5	Visualize and project the orthographic, isometric and perspective sections of simple solids.	3	1	-	-	-	-	-	-	-	-	-	-	3	1	-
Average		3	1	-	-	-	-	-	-	-	-	-	-	3	1	-

Semester-I																	
22CS101 - Problem Solving and C Programming																	
Course Outcomes		Program Outcomes												Program Specific Outcomes			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1	Explain the concepts of C Programming and roles of system software in programming	2	1	3	-	-	-	-	-	-	-	-	-	3	1	-	-
2	Use general problem-solving techniques to develop solution to problems	2	1	3	-	2	-	-	-	-	-	-	-	3	2	-	-
3	Apply the concepts of C Programming to develop solutions by writing C programs	2	1	3	-	2	-	-	-	-	-	-	-	3	3	-	-
Average		2	1	3	-	2	-	-	-	-	-	-	-	3	2	-	-

Semester-I																
22EN102 - Professional Skills Laboratory																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Read passages fluently with good pronunciation	-	-	-	1	-	-	-	-	2	3	-	1	-	-	1
2	Develop an expressive style of reading	-	-	-	1	-	-	-	-	2	3	-	1	-	-	1
3	Make effective oral presentations in technical and general contexts	-	-	-	2	-	-	-	-	2	3	-	1	-	-	1
4	Excel at professional oral communication	-	-	-	2	-	-	-	-	2	3	-	1	-	-	3
Average		-	-	-	1.5	-	-	-	-	2	3	-	1	-	-	1.5

Semester-I																
22PH103 - Physics Laboratory																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Handle different measuring instruments and to measure different parameters.	3	2	-	3	3	-	-	-	3	1	-	2	1	1	1
2	Calculate the important parameters and to arrive at the final result based on the experimental measurements.	3	2	-	2	1	-	-	-	2	-	-	1	1	1	1
Average		3	2	-	2.5	2	-	-	-	2.5	1	-	1.5	1	1	1

Semester-I																
22CY102 - Chemistry Laboratory																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Summarize the applicability of the practical skill gained in various fields.	1	1	-	3	-	-	-	-	-	-	-	-	2	-	-
2	Calculate the composition of brass quantitatively and the molecular weight of polymers.	1	2	-	3	-	-	-	-	-	-	-	-	2	-	-
3	Understand the principle and applications of conductometric and ph titrations, spectrometer, and potentiometric titrations.	2	2	-	3	-	-	-	-	-	-	-	-	2	-	-
Average		1.3	1.7	-	3	-	-	-	-	-	-	-	-	2	-	-

Semester-I																	
22EE102 - Basic Electrical And Electronics Engineering Laboratory																	
Course Outcomes		Program Outcomes												Program Specific Outcomes			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1	Analyse DC and AC circuits.	1	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-
2	Calculate various losses in transformer.	1	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-
3	Recognise the parts of single-phase and three phase induction motors.	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
4	Demonstrate the characteristics of electron devices.	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
5	Practice electrical connections by wires of appropriate ratings.	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
Average		1	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-

Semester-II																
22EN101 - Communicative English																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Comprehend the main ideas, key details and inferred meanings of technical texts	-	-	-	1	-	-	-	-	1	3	-	1	-	-	1
2	Use language effectively at technical and professional contexts	-	-	-	1	-	-	-	-	1	3	-	2	-	-	2
3	Apply the academic and functional writing skills in formal and informal communicative contexts	-	-	-	2	-	-	-	-	1	3	-	1	-	-	1
4	Interpret pictorial representation of statistical data and charts	-	-	-	3	-	-	-	-	1	3	-	1	-	-	1
Average		-	-	-	1.8	-	-	-	-	1	3	-	1.3	-	-	1.3

Semester-II																
22MA201 - Partial Differential Equations, Vector Calculus and Complex Variables																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand how to solve the given standard partial differential equations.	3	2	1	2	-	-	-	-	-	-	-	-	2	-	-
2	Solve higher order partial differential equations.	3	2	1	2	-	-	-	-	-	-	-	-	2	-	-
3	Use Gauss, Stokes and Green's theorems for the verification of line, surface and volume integrals.	3	2	1	2	-	-	-	-	-	-	-	-	2	-	-
4	Familiar with the concept of Conformal and Bilinear transformations.	3	2	1	2	-	-	-	-	-	-	-	-	2	-	-
5	Acquire the knowledge of Contour integration over unit circle and semi-circle.	3	2	1	2	-	-	-	-	-	-	-	-	2	-	-
Average		3	2	1	2	-	-	-	-	-	-	-	-	2	-	-

Semester-II																
22PH101 - Engineering Physics																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the principle, production of ultrasonic wave and acoustics of buildings.	3	2	1	1	1	1	-	-	-	-	-	2	2	1	-
2	Understand the principle and applications of laser and optical fiber.	2	3	1	1	2	1	-	-	-	-	-	2	1	1	-
3	Analyze various modes involved in heat transmission	3	2	1	1	-	-	-	-	-	-	-	1	2	-	-
4	Gain knowledge in basic concept of quantum physics.	3	2	1	1	2	-	1	-	-	-	-	1	1	-	-
5	Recognize crystal structure, crystal defects and crystal growth techniques.	2	2	1	1	2	-	-	-	-	-	-	1	-	1	1
Average		2.6	2.2	1	1	1.7	1	1	-	-	-	-	1.4	1.5	1	1

Semester-II																
22ES101 - Engineering Mechanics																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Apply the various methods to determine the resultant forces and its equilibrium acting on a particle in 2D and 3D	3	2	2	1	-	-	-	-	-	-	-	1	3	1	-
2	Apply the concept of reaction forces (non-concurrent coplanar and noncoplanar forces) and moment of various support systems with rigid bodies in 2D and 3D.	3	2	2	1	-	-	-	-	-	-	-	1	3	1	-
3	Evaluate area moments of inertia for various sections by applying the concepts of centroids.	3	2	2	1	-	-	-	-	-	-	-	2	3	2	-
4	Apply the concepts of frictional forces at the contact surfaces of various engineering systems.	3	1	2	1	-	-	-	-	-	-	-	1	3	2	-
5	Apply the various methods for evaluating dynamic parameters of the particles subjected to concurrent coplanar forces.	3	1	2	1	-	-	-	-	-	-	-	1	3	2	-
Average		3	1.6	2	1	-	-	-	-	-	-	-	1.2	3	1.6	-

Semester-II																
22HS201 - Universal Human Values																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Become more aware of themselves, and their surroundings (family, society, nature) and become more responsible in life	-	-	1	-	-	1	-	2	-	1	-	3	2	-	1
2	Handle problems with sustainable solutions, while keeping human relationships and human nature in mind	-	-	1	-	-	3	-	1	-	1	-	3	1	-	1
3	Become sensitive to their commitment towards what they have understood (human values, human relationship and human society)	-	-	1	-	-	2	-	1	-	1	-	3	1	-	2
4	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.	-	-	2	-	-	1	-	1	-	1	-	3	1	-	1
Average		-	-	1.3	-	-	1.8	-	1.3	-	1	-	3	1.3	-	1.3

Semester-II																
22MCIN01 - Engineering Sprints																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Apply street fight engineering concepts to solve problems	2	3	-	-	-	-	-	-	2	-	2	-	-	-	2
2	Construct flowcharts & block diagrams for algorithms	2	-	-	3	-	-	-	-	2	-	-	-	-	-	2
3	Apply the Idea Hexagon Tool to learn innovation models	2	2	-	3	-	-	-	-	2	-	2	-	-	-	2
4	Understand basic electronics for building hardware	2	2	-	3	-	-	-	1	2	-	2	-	-	-	2
5	Examine real-world problems with a system view	-	3	-	-	-	1	2	-	2	1	2	-	-	-	2
Average		2	2.5	-	3	-	1	2	1	2	1	2	-	-	-	2

Semester-II																	
22CS102 - Computer Practice And C Programming Laboratory																	
Course Outcomes		Program Outcomes												Program Specific Outcomes			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1	Demonstrate the usage of features supported by word processing applications.	-	-	-	-	-	-	-	-	-	-	3	-	-	1	-	-
2	Demonstrate the usage of features supported by spread sheet applications.	2	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
3	Apply general programming techniques to develop digital solution to problems	2	3	3	-	-	-	-	-	-	-	-	-	3	2	-	-
4	Implement solutions develop with general programming techniques in C programming language	1	1	1	-	-	-	-	-	-	-	-	-	3	3	-	-
Average		1.6	2.3	2	-	-	-	-	-	-	-	3	-	3	1.7	-	-

Semester-III																
22MA305 - Fourier Series, Boundary Values Problems and Transforms																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Acquire knowledge about the Fourier series.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
2	Appreciate the physical significance of Fourier series techniques in solving one and two-dimensional heat flow problems and one-dimensional wave equations.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
3	Apply the knowledge of the Laplace transforms.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
4	Apply the knowledge of Fourier transform in engineering problems.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
5	Apply the knowledge of Z-transform in engineering problems.	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
Average		3	2	-	2	-	-	-	-	-	-	-	-	2	-	-

Semester-III																
22ME301 - Engineering Thermodynamics																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the concepts of zeroth, first and second law of thermodynamics.	3	3	2	2	-	-	1	-	-	-	-	1	3	1	1
2	Analyze the various work and heat interactions for different types of processes for closed and open systems	3	3	2	2	-	-	1	-	-	-	-	1	3	1	1
3	Evaluate the different properties of pure substances using steam tables and Mollier chart	3	3	3	2	-	1	1	-	-	-	-	1	3	1	1
4	Analyze the performance of steam power cycle.	2	3	2	2	-	1	1	-	-	-	-	1	3	1	1
5	Derive thermodynamic relations for ideal and real gases.	3	3	2	2	-	1	-	-	-	-	-	1	3	1	1
Average		2.8	3	2.2	2	-	1	1	-	-	-	-	1	3	1	1

Semester-III																
22ME302 - Fluid Mechanics and Machinery																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the basic concepts and properties of fluids	3	1	1	-	-	-	2	-	-	-	1	-	2	2	1
2	Analyze the kinematic and dynamic concepts of fluid flow	3	3	1	-	2	-	-	-	-	-	-	-	2	2	1
3	Understand the various incompressible fluid flow through pipes and between parallel plates	2	3	2	2	1	-	-	-	-	-	-	-	2	2	1
4	Apply the principles of fluid mechanics to design and operation of hydraulic turbines	3	3	3	2	1	2	1	-	-	-	-	-	2	2	1
5	Apply the principles of fluid mechanics to design and operation of hydraulic pumps	3	3	3	2	1	2	1	-	-	-	-	-	2	2	1
Average		2.8	2.6	2	2	1.2	2	1.3	-	-	-	1	-	2	2	1

Semester-III																
22ME303 - Manufacturing Processes																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Describe the operational features of various casting processes, design of gate, riser and discover various defects in casting.	2	1	2	1	-	-	-	-	-	1	-	-	1	2	1
2	Explain various metal joining processes and compare them.	2	1	2	1	-	1	-	-	1	1	-	-	1	2	1
3	Summarize several types of metal forming processes and select suitable method for different applications.	1	1	1	1	-	-	-	-	-	1	-	-	1	1	1
4	Analyze various manufacturing methods for plastics and their needs in industry.	1	1	1	-	1	-	-	-	-	1	-	-	1	1	1
5	Describe various sheet metal forming processes, load estimation calculation and principles of powder metallurgy	-	1	-	-	-	-	-	-	1	1	-	-	1	-	1
Average		1.5	1	1.5	1	1	1	-	-	1	1	-	-	1	1.5	1

Semester-III																
22MT310 - Materials Engineering																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the formation of materials and their classification based on atomic structure.	1	1	2	2	1	1	1	-	-	-	-	-	2	3	1
2	Understand the principles of various heat treatment processes in fabrication industry.	1	-	2	1	1	2	1	-	-	-	-	-	2	3	1
3	Describe properties, applications and types of various ferrous and non-ferrous metals used in fabrication industry	-	1	1	1	1	-	1	-	-	-	-	-	3	2	1
4	Describe various types of failure and select methods for destructive testing	-	2	2	1	1	1	1	-	-	-	-	-	2	3	1
5	Select methods for Non-destructive testing	-	2	2	2	1	-	1	-	-	-	-	-	2	2	1
Average		1	1.5	1.8	1.4	1	1.3	1	-	-	-	-	-	2.2	2.6	1

Semester-III																
22MCIN02 - Innovation Sprints																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Identify real-world problems	-	3	-	-	-	2	1	-	2	-	-	-	-	-	2
2	Apply the challenge curation techniques to real-world problems.	-	3	-	2	-	-	-	-	2	-	-	-	-	-	2
3	Analyze the problems and generate solutions to address the challenges	-	-	3	2	-	-	-	-	2	-	-	-	-	-	2
4	Build solutions using prototyping tools & techniques	2	-	3	-	-	-	-	1	2	-	-	-	-	-	2
5	Develop an innovation pitch to effectively communicate the idea to solve the identified problem	-	-	-	-	-	-	-	-	2	3	-	-	-	-	2
Average		2	3	3	2	-	2	1	1	2	3	-	-	-	-	2

Semester-III																	
22NC301 - NCC Course-II (Only For NCC Students)																	
Course Outcomes		Program Outcomes												Program Specific Outcomes			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1	Acquired knowledge about social and legal responsibilities.	3	1	-	-	-	-	-	-	-	-	-	-	-	3	1	1
2	Understand the adventure activities and verbal training on defense examinations.	3	3	2	3	-	-	-	-	-	-	-	-	-	3	2	1
3	Understand the technical knowledge on aero engines and map reading.	3	2	3	1	-	2	-	-	-	-	-	-	-	3	2	1
4	Understand the structure and control of an aircraft.	3	2	2	2	-	-	-	-	-	-	-	-	-	3	2	1
5	Understand and learn the importance of avionic instruments on aircraft control.	3	-	-	-	-	1	-	-	-	-	-	-	-	3	3	1
Average		3	2	2.3	2	-	1.5	-	-	-	-	-	-	-	3	2	1

Semester-III																
22ME304 - CAD Laboratory																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Describe how CAD technology can be leveraged in the design process and the basic and advanced features available with CAD software	2	2	1	2	3	-	1	-	-	-	2	-	2	2	1
2	Design a part or assembly of parts using Computer-Aided Design software.	1	1	1	1	3	-	1	-	-	-	-	-	2	2	1
3	Design a detailed view of part or assembly of parts using Computer-Aided Design software.	2	2	2	1	2	-	1	-	-	-	1	-	2	2	1
Average		1.7	1.7	1.3	1.3	2.7	-	1	-	-	-	1.5	-	2	2	1

Semester-III																
22CE308 - Strength Of Materials and Fluid Mechanics Laboratory																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Learn the various techniques of testing methods for materials	1	2	1	1	-	-	-	-	1	-	-	-	1	1	3
2	Perform test and identify the different characteristics of materials.	1	2	1	1	-	-	-	-	1	-	-	-	2	1	2
3	Perform experiments on hydraulic machines to draw the performance characteristics.	1	2	2	2	-	-	-	-	1	-	-	-	2	1	3
Average		1	2	1.3	1.3	-	-	-	-	1	-	-	-	1.7	1	2.7

Semester-IV																	
22ME401 - Kinematics of Machinery																	
Course Outcomes		Program Outcomes												Program Specific Outcomes			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1	Demonstrate and understand the concepts of various mechanisms and pairs.	3	2	2	1	-	-	-	-	-	-	-	-	-	3	1	-
2	Analyze the velocity and acceleration of simple mechanisms.	3	2	2	1	-	-	-	-	-	-	-	-	-	3	1	-
3	Construct the cam profile for various motion.	3	2	2	1	-	-	-	-	-	-	-	-	-	3	1	-
4	Solve problems on gears and gear trains.	3	2	2	1	-	-	-	-	-	-	-	-	-	3	1	-
5	Evaluate the friction in transmission system	3	2	2	1	-	-	-	-	-	-	-	-	-	3	1	-
Average		3	2	2	1	-	-	-	-	-	-	-	-	-	3	1	-

Semester-IV																
22ME402 - Thermal Engineering																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Analyze the performance parameters in IC engines and air standard cycles.	3	1	-	-	-	-	-	-	-	-	-	-	3	1	1
2	Analyze the performance of steam nozzle and turbines and understand the concepts of compounding.	3	3	2	3	-	-	-	-	-	-	-	-	3	2	1
3	Evaluate the performance parameters of an air compressor.	3	2	3	1	-	2	-	-	-	-	-	-	3	2	1
4	Apply the principles of Psychrometry for air-conditioning processes.	3	2	2	2	-	-	-	-	-	-	-	-	3	2	1
5	Analyze the vapour compression refrigeration cycle and evaluate COP and refrigerating effect.	3	-	-	-	-	1	-	-	-	-	-	-	3	3	1
Average		3	2	2.3	2	-	1.5	-	-	-	-	-	-	3	2	1

Semester-IV																
22ME403 - Metal Cutting and Machine Tools																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Explain the mechanism of material removal processes.	2	1	-	1	-	-	-	-	-	1	1	-	2	-	1
2	Describe the constructional and operational features of special-purpose lathes, shaper and planner.	-	1	1	1	-	-	-	-	-	1	1	1	1	2	3
3	Gain working exposure to hole-making operations, grinding and broaching machines utilized in industries.	-	1	1	-	-	-	-	-	-	1	1	1	1	2	2
4	Study of special-purpose machine tools, operations and its uses in industries.	-	1	1	-	-	-	-	-	-	1	1	1	1	2	2
5	Summarize unconventional machining processes and additive manufacturing processes and their applications.	-	1	-	-	2	-	2	-	2	1	1	1	1	2	2
Average		2	1	1	1	2	-	2	-	2	1	1	1	1.2	2	2

Semester-IV																
22ME404 - Hydraulics and Pneumatics																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Select the components as per the application	2	1	1	-	-	-	-	-	-	-	-	-	1	1	1
2	Apply the working principles of hydraulic actuators and control components.	-	2	2	1	-	-	-	-	-	-	-	-	1	1	1
3	Design and develop hydraulic circuits and systems.	1	2	3	-	-	1	-	-	-	-	-	-	1	2	1
4	Apply the working principles of pneumatic power system and its components.	1	1	3	2	2	-	-	-	-	-	-	-	2	1	1
5	Solve problems and troubles in fluid power systems.	1	1	2	-	-	-	-	-	-	-	-	-	1	1	1
Average		1.2	1.4	2.2	1.5	2	1	-	-	-	-	-	-	1.2	1.2	1

Semester-IV																
22CE409 - Strength of Materials																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Evaluate the stress, strain and strain energy of simple bars	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
2	Familiarize the load transferring mechanism in beams and stress distribution due to shearing force and bending moment	2	2	1	1	-	-	-	-	-	-	-	-	1	2	-
3	Evaluate the slope and the deflection of beams and strengths of the columns	3	2	1	1	-	-	-	-	-	-	-	-	2	2	-
4	Analyze and design thin and thick shells for the applied internal and external pressures.	3	2	2	2	-	-	-	-	-	-	-	-	2	-	1
5	Analyze the torsion behavior of shafts and coil springs	2	2	2	2	-	-	-	-	-	-	-	-	2	-	1
Average		2.4	1.8	1.4	1.5	-	-	-	-	-	-	-	-	1.7	2	1

Semester-IV																
22MCIN03 - Design Sprints																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the elements and principles of product and service design	3	-	1	-	-	-	-	-	2	-	-	-	-	-	2
2	Apply system thinking concepts in reverse engineering	2	3	-	-	-	-	-	-	2	-	-	-	-	-	2
3	Apply user research techniques to meet the UX needs of a customer and design a visual prototype	3	-	1	-	-	-	-	1	2	-	-	-	-	-	2
4	Develop prototyping models using the tools from mechanical prototyping models	-	-	3	2	3	-	-	-	2	-	-	-	-	-	2
5	Develop prototyping models using the tools from electrical and software prototyping methods	2	-	2	-	1	-	-	-	2	-	-	-	-	-	2
Average		2.5	3	1.7	2	2	-	-	1	2	-	-	-	-	-	2

Semester-IV																
22CYMC01 - Environmental Science																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Identify about the major renewable energy systems and will investigate the environmental impact of various energy sources as well as the consequences of various pollutants.	-	1	3	-	-	3	1	1	-	-	-	1	2	-	1
2	Predict the methods to conserve energy and ways to make optimal use of the energy for the future.	-	1	3	-	-	3	1	1	-	-	-	1	2	-	1
Average		-	1	3	-	-	3	1	1	-	-	-	1	2	-	1

Semester-IV																
22ME405 - Thermal Engineering Laboratory																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	To identify the components of IC engine and boiler, mountings and accessories and procedure of steam generation.	3	2	1	1	3	1	1	-	-	-	-	-	1	1	2
2	To construct port and valve timing diagram and determine the flash and fire point of fuel oil.	1	2	1	1	1	2	1	-	-	-	-	-	2	1	1
3	To analyze the petrol and diesel engine performance by conducting load test.	2	1	3	1	1	2	1	-	-	-	-	-	3	1	3
4	To analyze the diesel engine performance by retardation test.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	To study the characteristics of heat release in diesel engine and to study the p- θ diagram.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average		2	1.6	1.3	1	2	1.6	1	-	-	-	-	-	2	1	2

Semester-IV																
22ME406 - Manufacturing Technology Laboratory																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Operate machines tools for various assembly and fabrication tasks.	2	-	-	-	1	-	1	-	-	1	-	1	-	1	-
2	Set up machines like lathe shaper, grinding and milling machine for various applications	-	2	-	-	2	2	1	1	-	-	-	2	-	2	-
3	Perform machining time calculation in machining jobs.	3	1	-	1	-	-	2	-	1	1	-	1	2	1	3
4	Evaluate the accuracy & tolerance of components produced	3	3	-	-	2	-	-	2	-	-	-	-	-	2	-
5	Prepare gears using forming and generating methods of gear manufacturing	-	1	-	-	-	-	-	-	1	2	-	-	3	-	1
Average		2.6	1.7	-	1	1.6	2	1.3	1.5	2	1.3	-	1.3	2.5	1.5	2

Semester-V																
22ME501 - Design Of Machine Elements																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Explain the influence of steady and variable stresses in machine component design.	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
2	Apply the concepts of design to shafts, keys and couplings.	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
3	Familiarize the design of temporary and permanent joints	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
4	Design the various energy storing elements and engine components.	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
5	Familiarize the design of various types of bearings and pressure vessels.	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
Average		2	2	1	2	-	1	1	-	-	-	1	-	3	2	1

Semester-V																
22ME502 - Heat and Mass Transfer																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Analyze the mechanism of heat conduction under steady and transient conditions.	3	3	3	3	2	-	1	-	-	-	-	-	3	3	1
2	Develop solutions to problems involving convective heat transfer	3	3	3	3	2	-	1	-	-	-	-	-	3	3	1
3	Design a heat exchanger for any specific application	3	3	3	3	2	-	1	-	-	-	-	-	3	3	1
4	Adopt the concept of radiation heat transfer in real time systems	3	3	3	3	2	-	1	-	-	-	-	-	3	2	1
5	Develop solutions to problems involving combined heat and mass transfer	2	2	2	2	1	-	1	-	-	-	-	-	3	1	-
Average		2.8	2.8	2.8	2.8	1.8	-	1	-	-	-	-	-	3	2.4	1

Semester-V																
22ME503 - Metrology and Quality Control																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Explain the importance of measurements in engineering and the factors affecting measurements and to compute measurement uncertainty	-	-	-	-	-	-	2	1	2	-	-	-	2	1	-
2	Apply the working principle and the applications of linear and angular measuring instruments	-	-	-	-	-	-	3	1	2	-	-	-	1	2	-
3	Interpret of various tolerance symbols.	-	-	-	-	-	-	2	1	-	-	-	-	2	1	-
4	Apply the SQC methods in manufacturing.	-	-	-	3	-	-	2	-	1	-	-	-	1	2	-
5	Apply the advances in measurements for quality control in manufacturing industries.	-	-	-	2	-	-	-	3	1	-	-	-	2	1	-
Average		-	-	-	2.5	-	-	2.2	1.2	1.5	-	-	-	1.6	1.4	-

Semester-V																
22ME504 - Dynamics of Machinery																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Apply basic principles of mechanisms in mechanical system	2	2	3	3	1	-	-	-	-	1	-	3	2	1	2
2	Familiarize the static and dynamic analysis of simple mechanisms	2	2	3	2	1	-	-	-	-	1	-	3	2	1	2
3	Analyze the mechanical systems subjected to free vibration	2	2	3	2	-	-	-	-	-	1	-	3	2	1	2
4	Analyze mechanical systems subjected to forced vibration	2	2	3	2	1	-	-	-	-	1	-	3	2	1	2
5	Analyze the various types of governors and its speed control mechanism	1	2	3	2	-	-	-	-	-	1	-	3	2	1	1
Average		1.8	2	3	2.2	1	-	-	-	-	1	-	3	2	1	1.8

Semester-V																
22ME505 - Instrumentation and Control System																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Apply common measurement characteristics and terms to select sensors to meet control and monitoring requirements	1	1	2	2	3	-	-	-	1	-	-	3	1	-	-
2	Design, build and test sensor interface circuits including amplifiers to process the measured variable into a useful signal in the presence of noise and environmental variations	-	-	2	2	-	-	-	-	-	-	-	-	2	1	-
3	Select and design appropriate signal processing to its instrumentation and control and their measurement	1	2	2	2	2	2	1	-	2	-	1	1	-	2	1
4	Understand and apply basic science, theory control theory and apply them to control engineering problems.	-	1	2	3	1	-	2	-	-	-	-	2	-	-	-
5	Analyse the performance of systems and components through the use of analytical techniques	-	2	3	3	1	-	-	1	2	1	-	3	-	-	2
Average		1	1.5	2.2	2.4	1.7	2	1.5	1	1.2	1	1	2.2	1.5	1.5	1.5

Semester-V																
22ME506 - Dynamics and Metrology Laboratory																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Handle different measurement tools	1	3	2	2	3	-	-	-	-	-	-	-	3	1	2
2	Perform measurements with accuracy.	-	2	-	3	1	1	-	-	-	-	-	-	1	2	3
3	Avoid errors in measurement	3	1	-	-	-	2	-	-	-	-	-	-	2	3	1
4	Understand balancing of equipment	2	3	-	1	3	1	-	-	-	-	-	-	3	2	1
Average		2	2.3	2	2	2.3	1.6	-	-	-	-	-	-	2.3	2	1.8

Semester-V																
22EN502 - Placement and Career Training Laboratory																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Participate in group discussion and interview confidently	-	-	-	1	-	-	-	-	2	3	-	1	-	-	1
2	Develop adequate soft skills and career skills required for the workplace	-	-	-	2	-	-	-	-	2	3	-	1	-	-	2
3	Make effective presentations on given topics	-	-	-	2	-	-	-	-	1	3	-	1	-	-	1
4	Apply their verbal ability and reasoning ability in campus interviews	-	-	-	1	-	-	-	-	2	3	-	1	-	-	2
Average		-	-	-	1.5	-	-	-	-	1.8	3	-	1	-	-	1.5

Semester-V																	
22ME507 - Heat Transfer and Refrigeration Laboratory																	
Course Outcomes		Program Outcomes												Program Specific Outcomes			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1	Calculate the thermal conductivity of various conducting and non-conducting materials	1	3	-	2	-	-	-	-	-	-	-	-	-	3	1	2
2	Estimate the heat transfer coefficient in free and forced convections for various geometries.	1	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
3	Evaluate the heat flux and the heat transfer coefficient in various types of heat exchangers	1	3	1	-	-	-	-	-	-	-	-	-	-	3	-	2
4	Obtain the radiation parameters such as emissivity, wave length and surface temperatures	1	2	1	1	-	-	-	-	-	-	-	-	-	2	-	1
5	Test the performance of the refrigeration and air-conditioning systems and cooling towers.	1	2	-	1	-	-	-	-	-	-	-	-	-	1	1	1
Average		1	2.4	1	1	-	-	-	-	-	-	-	-	2.2	6	1.4	

Semester-V																
22ME601 - Mini Project																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Initiate the students to come out with innovative ideas for various applications.	3	3	3	3	2	3	3	1	3	-	2	-	3	3	3
2	Create an environment to convert the ideas into design of prototype for useful industrial, agricultural and social applications.	3	3	3	3	2	3	3	-	3	-	1	-	3	3	-
3	Familiarize the feasibility study and manage activities to complete task in specified duration.	2	2	2	2	2	1	1	1	3	1	2	3	3	3	-
4	Assign and undertake tasks in a team as per team discussion.	3	2	2	1	1	1	2	3	3	3	-	3	3	3	-
5	Do presentation and write technical reports for effective communication within and outside the team.	-	-	-	-	2	2	-	1	3	3	-	2	3	-	3
Average		2.7	2.5	2.5	2.2	1.8	2	2.2	1.5	3	1.7	1.3	2.3	3	3	3

Semester-VII																
22ME701 - Mechatronics																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the basic elements underlying mechatronics systems and integrate them in the design of mechatronics systems.	1	2	-	2	-	-	-	-	-	-	-	1	1	-	2
2	Develop a simulation model for simple physical systems and illustrate mechatronics design process.	2	2	3	3	1	-	-	-	-	-	-	2	2	2	-
3	Design, interface and understand issues of implementation of different actuation in a mechatronics system for a set of specifications.	-	-	2	2	-	-	2	-	2	-	-	2	-	-	-
4	Interface electromechanical systems to PLCs.	-	2	3	3	3	-	-	-	3	-	3	2	-	2	1
5	Attain practical experience in applying knowledge gained in the course through a hands-on project.	1.5	2	2.7	3	2	-	2	-	2.5	-	3	3	1.5	2	1.5
Average		8	1.6	2	2.6	1.4	4	8	2	1.6	4	8	2	6	8	1.2

Semester-VII																
22ME702 - Finite Element Analysis																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Formulate the physical design problems into FEA including domain discretization, polynomial interpolation, application of boundary conditions, assembly of global arrays, and solution of the resulting algebraic systems.	3	3	2	1	1	-	-	-	-	-	-	-	3	1	-
2	Apply FEM concept for developing FE equations for solving 10D problems with bar, truss and beam elements.	3	3	2	1	1	-	-	-	-	-	-	-	3	1	-
3	Apply FEM concept for developing FE equations for solving 2-D problems with CST elements for plane stress, plane strain and axisymmetric problems.	3	3	2	1	1	-	-	-	-	-	-	-	3	1	-
4	Derive iso-parametric formulations for quadrilateral element and apply the gauss quadrature for numerical integration.	3	3	2	1	1	-	-	-	-	-	-	-	3	1	-
5	Apply the concepts of FEA for solving 10D heat transfer and fluid flow problems under the given boundary conditions.	3	3	2	1	1	-	-	-	-	-	-	-	3	1	-
Average		3	3	2	1	1	-	-	-	-	-	-	-	3	1	-

Semester-VII																
22ME703 - Mechatronics Laboratory																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Select various control valves and use them in hydraulic and pneumatic circuit development	1	3	-	-	-	-	-	-	-	-	-	-	1	1	1
2	Get adequate knowledge to simulate the basic electric, hydraulic and pneumatic system using simulation software.	-	-	1	2	-	-	-	-	-	-	-	-	1	2	2
3	Get adequate knowledge about the characteristics of various actuators and methods of tuning of controller in a Mechatronic system.	-	-	1	-	-	-	1	2	-	-	-	-	2	1	3
4	Understand how to interface electromechanical systems to PLCs.	-	-	-	3	-	-	-	-	-	-	2	3	2	1	3
5	Gain practical experience in data acquisition system and develop and evaluate alternate solutions to real world problems.	-	-	3	-	-	-	-	-	2	1	2	-	2	2	3
Average		1	3	1.6	2.5	-	-	1	2	2	1	2	3	1.6	1.4	2.4

Semester-VII																
22ME704 - Simulation Laboratory																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Analyze the structural components for deflection, stress and reaction forces.	2	2	-	-	3	-	-	1	-	-	-	1	1	-	-
2	Analyze the force, stress, deflection in mechanical components.	2	2	-	-	3	-	-	1	-	-	-	1	1	-	-
3	Analyze thermal stress and heat transfer in mechanical components.	2	2	-	-	3	-	-	1	-	-	-	1	2	-	-
4	Analyze the vibration of mechanical components.	2	2	-	-	3	-	-	1	-	-	-	1	2	-	-
5	Analyze the modal, harmonic, transient and spectrum concepts in mechanical components.	2	2	-	-	3	-	-	1	-	-	-	1	2	-	-
Average		2	2	-	-	3	-	-	1	-	-	-	1	1.6	-	-

Semester-VII																
22ME705 - CAM Laboratory																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the features and specifications of CNC machines	2	1	2	2	2	1	-	-	2	-	2	-	2	2	1
2	Develop the process planning sheets and tool layouts.	1	1	1	1	-	-	-	-	-	-	3	-	1	1	1
3	Understand the CAM software and its programming.	1	2	1	2	2	3	-	-	-	-	3	-	2	2	1
4	Use the CAM software and prepare CNC part programs.	1	2	1	1	1	3	-	-	-	-	3	-	2	2	1
5	Execute the part program and machine the component as per the production drawing.	1	2	1	1	1	3	-	-	-	-	3	-	2	2	1
Average		1.2	1.6	1.2	1.4	1.5	2.5	-	-	2	-	2.8	-	1.8	1.8	1

Semester-VII																
22ME706 - Project – I																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Initiate and motivate the students to come out with innovative ideas for different applications.	3	3	3	3	2	3	3	1	3	-	2	-	3	3	3
2	Create an environment to convert the ideas into design of prototype for useful industrial, agricultural and social applications.	3	3	3	3	2	3	3	-	3	-	1	-	3	3	-
3	Create an environment to convert the design into manufacturing of prototype for useful industrial, agricultural and social applications.	2	2	2	2	2	1	1	1	3	1	2	3	3	3	-
4	Assign and undertake tasks in a team as per team discussion.	3	2	2	1	1	1	2	3	3	3	-	3	3	3	-
5	Do presentation and write technical reports for effective communication within and outside the team.	-	-	-	-	2	2	-	1	3	3	-	2	3	-	3
Average		2.7	2.5	2.5	2.2	1.8	2	2.2	1.5	3	2.3	1.6	2.7	3	3	3

Semester-VIII																
22ME801 - Project – II																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Initiate and motivate the students to come out with innovative ideas for different applications.	3	3	3	3	2	3	3	1	3	-	2	-	3	3	3
2	Create an environment to convert the ideas into design of prototype for useful industrial, agricultural and social applications.	3	3	3	3	2	3	3	-	3	-	1	-	3	3	-
3	Create an environment to convert the design into manufacturing of prototype for useful industrial, agricultural and social applications.	2	2	2	2	2	1	1	1	3	1	2	3	3	3	-
4	Assign and undertake tasks in a team as per team discussion.	3	2	2	1	1	1	2	3	3	3	-	3	3	3	-
5	Do presentation and write technical reports for effective communication within and outside the team.	-	-	-	-	2	2	-	1	3	3	-	2	3	-	3
Average		2.7	2.5	2.5	2.2	1.8	2	2.2	1.2	3	2.3	1.6	2.6	3	3	3

Semester-VIII (Professional Electives – I)																
22MEPE11 - Automobile Engineering																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Describe the fundamental concepts of automobile engineering	3	3	3	3	2	-	1	-	-	-	2	2	-	3	-
2	Analyze the various types of power train and fuel supply and management systems.	3	3	3	3	2	-	1	-	-	-	2	2	-	3	-
3	Analyze the various types of automatic transmission and steering systems for a vehicle.	3	3	3	3	2	-	1	-	-	-	2	2	-	3	-
4	Discuss various types of braking and suspension system.	3	3	3	3	2	-	1	-	-	-	2	2	-	3	-
5	Troubleshoot the electrical and electronics instrumentation system in the automobiles.	3	3	3	3	2	-	1	-	-	-	2	2	-	3	-
Average		3	3	3	3	2	-	1	-	-	-	2	2	-	3	-

Semester-VIII																
22MEPE12 - Composite Materials																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Identify the various matrices, reinforcements and their combinations in composite materials and select composite materials for suitable applications.	2	2	2	1	-	2	-	1	-	-	1	-	2	2	1
2	Develop suitable Metal Matrix Composites.	2	1	1	1	-	-	1	-	-	-	1	-	2	1	-
3	Identify perfect Ceramic Matrix Composites for high temperature applications.	2	1	1	1	-	-	1	-	-	-	1	-	2	1	-
4	Choose various combinations of fibres and resins and select an appropriate manufacturing technique for composite materials.	2	1	1	1	-	1	1	1	-	-	1	-	2	1	-
5	Predict the appropriate characterization testing methods for different classes of composites and manufacturing process, application polymer nano composites.	2	2	1	1	-	1	1	1	-	-	1	-	2	2	1
Average		2	1.4	1.2	1	-	1.3	1	1	-	-	1	-	2	1.4	1

Semester-VIII																
22MEPE13 - Computer Integrated Manufacturing																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Recognize the manufacturing activities interrelated with computers.	-	-	-	-	-	-	-	-	1	-	1	1	1	2	3
2	Understand the concept of group technology and the various approaches of computer aided process planning	-	-	-	-	-	-	-	-	1	-	1	-	1	2	2
3	Explain the phases of shop floor control activities.	-	-	1	-	-	-	-	-	1	-	1	-	1	2	2
4	Apply the system modeling tools in CIM.	-	1	1	1	3	-	-	-	3	2	1	-	1	1	3
5	Explain the applications of database and system protocol	-	-	1	3	2	-	-	-	2	2	1	1	1	2	2
Average		-	1	1	2	2.5	-	-	-	1.6	2	1	1	1	1.8	2.4

Semester-VIII																
22MEPE14 - Design of Transmission System																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Appreciate the functions of various transmission elements and their assemblies	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
2	Design different transmission components according to the requirement as per standards using data books.	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
3	Apply the appropriate calculation procedures for the various systems designing	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
4	Design multi speed gear box for machine tool and automotive applications.	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
5	Design clutch and brake systems for engineering applications.	2	2	1	2	-	1	1	-	-	-	1	-	3	2	1
Average		2	2	1	2	-	1	1	-	-	-	1	-	3	2	1

Semester-VIII																
22MEPE15 - Energy Conversion In Industries																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Analyze the thermodynamic cycles used in power generation	3	2	2	1	1	-	1	-	-	-	-	-	2	1	1
2	Evaluate the merits of direct thermal energy conversion systems compared to conventional techniques	3	2	2	1	1	1	-	-	-	-	-	-	2	1	1
3	Analyze the performance of fuel cells	3	3	3	1	1	1	1	-	-	-	-	-	2	1	1
4	Select the best energy storage mechanism for any given application	2	2	3	1	1	1	1	-	-	-	-	-	2	1	1
5	Develop a mechanism for total energy recovery from a system adopting CHCP concept	2	2	2	2	1	1	1	-	-	-	-	-	2	1	1
Average		2.6	2.2	2.4	1.2	1	1	1	-	-	-	-	-	2	1	1

Semester-VIII

22MEPE16 - Gas Dynamics And Jet Propulsion

		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Describe the compressible fluid flow and isentropic flow through various ducts	-	-	1	1	-	1	1	-	-	1	-	-	-	-	-
2	Calculate the flow properties of isentropic flow using gas tables and charts	1	1	-	-	1	-	-	1	-	-	-	-	1	1	1
3	Differentiate normal and oblique shocks and determine their performance parameters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Explain the theory of jet propulsion and calculate the operating parameters of various jet engines	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
5	Illustrate the theory of rocket engines and determine their performance indicators	-	-	1	1	-	1	1	-	-	-	-	1	-	-	-
Average		1	1	1	1	1	1	1	1	-	1	-	1	1	1	1

Semester-VIII																
22MEPE17 - Renewable Energy System																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Impart knowledge about solar energy harvesting techniques and its storage system	1	2	3	2	1	-	2	2	3	1	1	2	2	1	3
2	Enhance insight into different wind energy methods to generate electricity.	1	2	3	2	1	-	2	2	3	1	1	2	2	1	3
3	Enrich the scholars to inculcate paramount energy conversion technologies and problems related to bio gas plants	-	2	3	2	1	-	2	2	3	1	1	2	2	1	3
4	Reveals the notion of obtaining abundant energy from the oceans	1	2	3	2	-	-	2	2	3	1	1	2	2	1	3
5	Impart knowledge about geothermal energy and fuel cells	1	2	3	2	1	-	2	2	3	1	1	2	2	1	3
Average		1	2	3	2	1	-	2	2	3	1	1	2	2	1	3

Semester-VIII (Professional Electives – II)

22MEPE21 - Advanced Strength of Materials

Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Familiarize the concepts of stress and strain at a point as well as the stress-strain relationships for homogenous, isotropic materials.	3	2	1	1	-	-	-	1	-	-	-	-	3	2	1
2	Evaluate the stresses and strains in axially-loaded members, circular torsion members, and members subject to flexural loadings.	2	3	3	1	-	-	-	-	-	-	-	-	3	2	1
3	Evaluate the stresses and strains associated with thick-wall spherical and cylindrical pressure vessels.	2	3	3	2	-	-	-	1	-	-	-	-	2	3	1
4	Evaluate the stresses in non-circular sections	2	2	2	2	2	-	1	1	-	-	1	-	3	2	1
5	Evaluate the stresses in circular and rectangular plates due to various types of loading and end conditions	2	2	2	2	2	-	-	1	-	-	-	-	3	2	1
Average		2.2	2.4	2.2	1.6	2	-	1	1	-	-	1	-	2.8	2.2	1

Semester-VIII																
22MEPE22 - Energy Efficient Buildings Design																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Apply the modern building aspects and the need of indoor air quality for comfort living.	2	1	1	1	-	2	-	-	-	-	-	-	2	1	1
2	Design an energy efficient landscape and evaluate the heat loss or gain through building components.	-	-	3	2	-	-	1	-	-	-	-	-	1	1	-
3	Develop novel solutions for storage integration in buildings and evolve passive building strategies.	-	-	1	1	-	-	1	-	-	-	-	-	-	-	-
4	Estimate the actual and accurate thermal load for various types of buildings.	1	1	1	1	-	-	1	1	-	-	-	-	1	1	1
5	Explain the importance of integrating various renewable energy resources in buildings.	-	-	-	-	-	1	1	-	1	1	-	-	-	-	-
Average		1.5	1	1.5	1.7	-	1.5	1	1	1	1	-	-	1.3	1	1

Semester-VIII																
22MEPE23 - Engineering System Analysis and Design																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the requirements of a system	1	2	2	1	2	-	-	-	-	-	-	-	2	1	-
2	Design system components and environments.	-	1	3	2	1	-	-	-	-	-	-	-	2	3	-
3	Build general and detailed models that assist programmers in implementing a system.	1	2	2	1	1	-	-	-	-	-	-	-	2	3	-
4	Design a database for storing data and a user interface for data input and output, as well as controls to protect the system and its data.	1	2	3	2	1	-	-	-	-	-	-	-	1	3	-
5	Understand the concepts of object modeling and dynamics modeling.	-	2	2	2	-	-	-	-	-	-	-	-	-	2	-
Average		1	1.8	2.4	1.6	1.2	-	-	-	-	-	-	-	1.7	2.4	-

Semester-VIII																
22MEPE24 - Industrial Engineering and Management																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Apply the knowledge in mathematics, science, and engineering in the direction to improve the productivity of industries,	3	2	1	1	-	-	-	-	-	-	-	-	2	2	-
2	Explain the concepts in engineering economic analysis for effective utilization and management of available facilities.	1	2	3	1	-	-	-	-	-	-	-	-	1	2	1
3	Explain the concepts of supply chain management for efficient use of available resources with aggregate planning	-	2	2	-	3	1	-	-	-	-	-	-	1	2	3
4	Apply the concept of JIT and modern manufacturing principles in professional organization	-	-	-	-	-	-	-	-	3	-	-	1	-	-	2
5	Identify modern concepts and marketing in management for applying them in professional organization	-	-	-	-	-	2	-	2	-	-	1	1	2	-	-
Average		2	2	2	1	3	1.5	-	2	3	-	1	1	1.5	2	1.5

Semester-VIII																
22MEPE25 - Internal Combustion Engines																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the concept, construction, and principle of operation of the engine and various engine Components.	3	2	2	1	-	-	-	-	-	-	-	-	3	2	1
2	Explain the fuel supply systems of SI and CI engines and understand the various injection systems of CI engine.	3	2	2	1	-	-	-	-	-	-	-	-	3	2	1
3	Analyze the combustion phenomenon in SI and CI engines.	3	1	2	2	2	2	3	-	-	-	-	-	2	3	1
4	Understand the Engine management system and exhaust emission control techniques.	2	1	2	1	2	2	3	-	-	-	-	-	2	3	1
5	Understand recent trends in internal combustion engines.	3	1	1	1	2	2	2	-	-	-	-	-	2	3	1
Average		2.8	1.4	1.8	1.2	2	2	2.7	-	-	-	-	-	2.4	2.6	1

Semester-VIII																
22MEPE26 - Machine Drawing																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Follow the drawing standards, fits and tolerances	2	1	2	1	-	1	1	-	-	-	1	-	2	2	1
2	Re-create part drawings, sectional views and assembly drawings as per standards	2	1	2	1	-	1	1	-	-	-	1	-	2	2	1
3	Analyze complex design systems related to mechanical engineering.	2	2	2	2	-	-	2	-	-	-	1	-	2	2	1
4	Improve skills to adopt modern methods in mechanical engineering as continuous improvement.	1	1	2	2	-	1	-	-	-	-	1	-	2	2	1
5	Understand the impact of engineering solutions in a global, economic, environment and societal context.	1	1	1	2	-	2	2	1	-	-	-	-	1	1	1
Average		1.6	1.2	1.8	1.6	-	1	1.5	1	-	-	1	-	1.8	1.8	1

Semester-VIII																
22MEPE27 - Power Plant Engineering																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Identify elements and their functions of steam power plant.	1	2	3	2	1	-	1	1	2	-	2	2	2	1	2
2	Identify elements and their functions of hydroelectric power plant	1	2	3	2	1	-	1	1	2	-	2	2	2	1	2
3	Identify elements and their functions of diesel and gas power plant.	1	2	3	2	1	-	1	1	2	-	2	2	2	1	2
4	Identify elements and their functions of nuclear power plant.	1	2	3	2	1	-	1	1	2	-	2	2	2	1	2
5	Study the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the cost of electrical energy production.	2	-	1	2	-	-	-	2	2	1	1	1	2	-	-
Average		1.2	2	2.6	2	1	-	1	1.2	2	1	1.8	1.8	2	1	2

Semester-VIII (Professional Electives – III)

22MEPE31 - Fuels And Combustion

Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the various kinds of fuels characteristics.	1	3	2	2	1	1	-	1	2	1	2	1	1	2	1
2	Determine flash and fire points of various fuel blends.	1	2	3	1	1	1	-	1	2	1	2	1	2	2	1
3	Classification, composition, properties and estimation of calorific value of gaseous fuels	1	1	2	2	1	1	-	1	2	1	2	1	2	3	1
4	Understand the thermodynamics behind combustion, flame propagation and choice of combustion systems.	1	3	2	3	1	1	-	1	2	1	2	1	3	2	1
5	Vast knowledge on effective employment of combustion equipment's	1	3	1	2	1	1	-	1	2	1	2	1	2	1	1
Average		1	2.4	2	2	1	1	-	1	2	1	2	1	2	2	1

Semester-VIII																
22MEPE32 - Maintenance Engineering																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the principles, functions and practices adapted in industry for the successful management of maintenance activities	1	3	-	2	3	3	2	-	1	1	1	3	2	3	3
2	Explain the different maintenance categories like preventive maintenance, condition monitoring and repair of machine elements	1	2	-	2	2	2	1	-	1	-	1	3	2	3	3
3	Illustrate the instruments used for condition monitoring in industry	-	3	1	1	2	1	-	-	1	-	-	2	2	2	2
4	Apply the repair methods in basic machine elements	3	2	1	2	2	-	-	-	-	-	-	-	.3	2	1
5	Apply the repair methods in material handling equipment	3	2	-	2	2	-	-	-	-	-	-	-	3	2	1
Average		1.6	2.4	1	1.8	2.2	2	1.5	-	1	1	1	2.7	1.9	2.4	2

Semester-VIII																
22MEPE33 - Non-Traditional Machining Processes																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the various Non-Traditional machining processes and its applications	3	2	-	1	-	-	-	-	-	-	1	-	2	2	1
2	Decide the appropriate process among various electro chemical processes	3	2	-	-	1	-	-	-	-	-	-	-	2	2	1
3	Justify the appropriate Thermo electric process based on the application and limitations	3	2	-	-	1	-	-	-	-	-	-	-	2	2	1
4	Understand the working principle and applications of Laser machining processes	2	1	-	-	1	-	-	-	-	-	-	-	2	2	1
5	Understand the working principle and applications of Micro-electro Mechanical processes	2	1	-	-	1	-	-	-	-	-	-	-	2	2	1
Average		2.6	1.6	-	1	1	-	-	-	-	-	1	-	2	2	1

Semester-VIII

22MEPE34 - Professional Ethics and Human Values

Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the core values toward the ethical behavior of an engineer.	-	-	-	-	-	-	3	1	3	-	-	2	1	-	-
2	Apply the ethical and moral principles in engineering experimentation	-	-	-	-	-	-	2	2	3	-	-	2	1	2	-
3	Expose the ethical and moral principles in engineering for safety.	-	-	-	-	-	-	3	2	3	-	-	2	1	2	-
4	Apply standard codes of moral conduct toward the ethical behavior of an engineer	-	-	-	-	-	-	3	3	2	-	-	2	1	2	-
5	Apply ethical and moral principles for engineers as managers, consultants, expert witness. Resolve global issues of ethics concerning weapon development and multinational companies.	-	-	-	-	-	-	2	2	3	-	-	2	1	-	-
Average		-	-	-	-	-	-	2.6	2	2.8	-	-	2	1	2	-

Semester-VIII																
22MEPE35 - Rapid Product Development Technologies																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Learn about the hurdles, basic-essentials and key-drivers of innovation in digital manufacturing and its application in Automobile, Aerospace, Bio-medical etc.	-	1	1	1	1	2	-	-	-	-	1	1	3	2	1
2	Recognize the operational features of Stereo Lithography Systems.	-	2	1	1	1	-	-	-	1	-	1	1	1	2	2
3	Explain the concept of Fusion Deposition Modelling.	-	2	1	1	1	-	-	-	1	-	1	1	1	2	2
4	Design for manufacture solid ground curing and concept modelers	-	2	3	1	1	-	-	-	1	-	1	1	1	2	2
5	Acquire the knowledge of Software for RP and apply RPT in Tooling.	-	1	-	1	3	-	-	-	1	-	1	-	3	2	3
Average		-	1.6	1.5	1	1.4	2	-	-	1	-	1	1	1.8	2	2

Semester-VIII																
22MEPE36 - Refrigeration & Air Conditioning																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the basic concepts and processes in refrigeration	3	-	-	-	-	1	2	-	-	-	-	-	2	2	1
2	Understand the components of vapour compression refrigerating system and its effects	2	3	-	2	-	1	1	-	-	-	-	-	2	2	1
3	Understand the other refrigeration systems and their applications	2	3	-	1	-	-	-	-	-	-	1	-	2	2	1
4	Solve the problems using psychrometric charts and psychrometric properties	2	1	-	-	-	-	-	-	-	1	-	-	2	2	1
5	Calculate the cooling load for designing air conditioning systems	2	2	1	2	1	2	1	-	-	-	1	-	2	2	1
Average		2.2	2.2	1	1.7	1	1.3	1.3	-	-	1	1	-	2	2	1

Semester-VIII																
22MEPE37 - Solar Energy Technology																
Course Outcomes		Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Explain various solar collectors in solar power plants.	3	1	-	-	-	2	1	-	-	-	-	-	2	1	2
2	Describe the variety of solar systems used in solar water heating systems.	3	2	1	2	-	1	-	-	-	-	1	-	2	2	2
3	Describe the solar radiation and its measurements.	3	2	-	2	3	2	-	-	-	-	1	-	2	2	1
4	Analyze solar space conditioning systems.	3	3	1	2	2	2	-	-	-	-	1	-	3	2	2
5	Design PV systems for power plants	3	2	3	2	3	2	-	-	-	-	1	-	2	3	2
Average		3	2	1.3	2	2.7	1.8	1	-	-	-	1	-	2.2	2	1.8