Government College of Engineering, Salem-636-11
Department of Mechanical Engineering
2018 Regulation
Course Outcomes
CO-PO Articulation matrix

Semester - I															
18MA101 - Matrices and Calculus															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Understand the fundamental knowledge of matrix theory.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Familiar with the concept of the differentiation and integration and its applications.	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
3	Acquire skills in applications of integral and vector calculus.	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Average		1.7	1.7	1	1	1	1	1	1	1	1	1	1	1	1	1

Semester-I															
18PH202-Physics - Electromagnetism															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the concepts of electrostatics, electrical potential, and their applications.	3	3	-	3	2	1	2	-	1	-	-	3	2	1	3
2	Interpret the concepts of dielectrics, laplace and poisons equation for electrostatic potential.	3	3	-	2	1	1	-	-	1	-	-	3	2	-	2
3	Apply the concepts of magneto statics, magnetic fields in matter and their application.	2	3	-	3	3	1	1	-	1	-	-	3	1	2	3
4	Apply the concepts of faraday's law, ampere's law, maxwell's equation.	3	2	-	3	2	1	1	-	1	-	-	2	2	1	3
5	Interpret the concepts of electromagnetic waves and poynting vector.	3	3	-	3	2	1	1	-	1	-	-	3	3	1	3
Average		2.8	2.8	-	2.8	2	1	1.2	-	1	-	-	2.8	2	1.2	2.8

Semester-I															
18EE103 - Basics of Electrical Engineering															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Verify ohm's law and kirchoff's laws for simple electrical circuits.	3	2	-	1	1	-	-	-	-	-	-	-	-	-	-
2	Verify simple network theorems for electrical circuits.	3	2	-	1	1	-	-	-	-	-	-	-	-	-	-
3	Solve problems on ac circuits and analyze three phase ac circuits.	3	3	-	2	1	1	1	-	-	-	-	-	-	-	-
4	Understand the performance of dc machines and transformers.	3	2	-	1	1	-	-	-	-	-	-	-	-	-	-
5	Basic understanding of power electronic circuits and their application in speed control of ac and dc machines.	3	2	-	1	1	-	-	-	-	-	-	-	-	-	-
Average		3	2.2	-	1.2	1	1.0	1.0	-	-	-	-	-	-	-	-

Semester-I															
18ME101 - Engineering Graphics & Design															
	Program Outcomes												**Program Specific Outcomes**		
Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1. Understand the conventions and the methods of engineering drawing.	1	2	-	-	-	-	-	-	-	-	-	-	1	1	2
2. Understand the fundamental concepts of theory of projection.	-	-	2	-	-	-	-	-	-	-	-	-	1	2	1
3. Understand the development of different surfaces.	-	-	-	2	1	-	-	-	-	-	-	-	2	1	1
4. Develop the relationships between 2d and 3d environments.	-	1	1	-	-	-	-	-	-	3	-	-	1	2	1
5. Demonstrate computer aided drafting.	1	2	-	1	1	-	-	-	-	-	-	2	2	1	3
Average	1.0	1.6	1.5	1.5	1.0	-	-	-	-	3.0	-	2.0	1.4	1.4	1.6

Semester-I														
18PH103 - 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	3	2	3	1	1	2	-	3	-	1	2	1	-	3
2	Calculate the important parameters and to arrive at the final result based on the experimental measurements.	3	3	2	3	1	1	2	-	3	-	1	2	1	-	3
Average	3	3	2	3	1	1	2	-	3	-	1	2	1	-	3

Semester-I															
18CY102 - 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	Know the applicability of the practical skill gained in various fields.	3	3	1	-	-	-	-	-	-	-	-	-	-	-	-
2	Know the composition of brass quantitatively and the molecular weight of polymers.	3	3	1	-	-	-	-	-	-	-	-	-	-	-	-
3	Understand the principle and applications of conductometric titrations, spectrometer and potentiometric titrations.	3	3	1	-	-	-	-	-	-	-	-	-	-	-	-
Average		3	3	1	-	-	-	-	-	-	-	-	-	-	-	-

Semester-I															
18EE104 - Basics of Electrical Engineering Laboratory															
		Program Outcomes												**Program Specific Outcomes**		
	Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Making electrical connections by wires of appropriate wires	3	2	-	1	1	-	1	1	-	-	-	-	-	-	-
2	Acquire exposure to common electrical components and measuring instruments.	3	2	-	1	1	-	-	-	-	-	-	-	-	-	-
3	Verify simple laws using electrical circuits.	2	1	-	1	1	-	-	-	-	-	-	-	-	-	-
4	Do experiment to understand the characteristics of transformers and electrical machines.	3	1	-	2	1	-	-	-	-	-	-	-	-	-	-
5	Understand the working of low tension switch gear components, ac and dc drives.	3	2	-	2	1	-	1	1	-	-	-	-	-	-	-
Average		2.8	1.6	-	1.4	1	-	1.0	1.0	-	-	-	-	-	-	-

Semester-I															
18EN103 - Professional Communication Laboratory															
	Course Outcomes	Program Outcomes											Program Specific Outcomes		
	Course Outcomes	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Read short passages fluently, avoiding mispronunciation, substitution, omission and transposition of word-pairs.	-	-	2	2	-	2	1	1	2	3	2	1	-	1	2
2	Vocalize words without the aid of pictures.	-	-	2	1	-	1	2	2	2	3	1	-	-	2	2
3	Develop a well-paced, expressive style of reading.	-	-	1	1	-	1	1	1	1	3	1	1	-	-	1
4	Make effective oral presentations on technical and general contexts.	-	-	2	2	-	-	2	2	1	3	2	2	-	1	2
5	Describe a process with coherence and cohesion.	-	-	2	1	-	1	1	1	-	3	2	2	-	2	3
Average		-	-	1.8	1.4	-	1.2	1.4	1.4	1.2	3	1.6	1.5	-	1.6	2

Semester II															
18EN101 - Professional English															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Read and summarize the main ideas, key details and inferred meanings from a passage.	-	-	2	1	-	1	2	2	2	3	1	1	-	1	2
2	Internalize the grammar items such as prepositions, articles, tenses, verbs, pronouns, and adverbs adjectives through contexts and apply them to spot errors.	-	-	1	2	-	-	1	1	1	3	2	1	-	1	2
3	Develop the ability to classify, check information and prepare reports.	-	-	2	1	-	-	2	2	2	3	1	2	-	-	2
4	Apply the academic and functional writing skills in new contexts.	-	-	2	2	-	-	2	2	1	3	2	2	-	1	2
5	Interpret pictorial representation of data and statistic.	-	-	2	1	-	1	1	1	-	3	2	2	-	2	3
Average		-	-	1.8	1.4	-	1.0	1.6	1.6	1.5	3	1.6	1.6	-	1.2	2.2

Semester-II															
18MA201 - Differential Equations and Complex Variables															
		Program Outcomes												Program Specific Outcomes		
	Course Outcomes	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the techniques of solving ordinary and partial differential equations of second and higher order that arise in engineering problems	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Familiar with the concept of conformal and bilinear transformations.	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
3	Acquire the knowledge of contour integration over unit circle and semi-circle.	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Average		2.7	1.7	1	1	1	1	1	1	1	1	1	1	1	1	1

Semester-II																
18CY101 - Chemistry																
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand in-depth knowledge of atomic and molecular orbitals based chemical aspects.	3	-	-	2	-	-	-	3	-	-	-	-	-	-	-
2	Realize the nature of periodic properties of elements and the knowledge of acids and bases.	3	-	-	-	-	3	-	-	-	-	-	-	-	-	-
3	Grasp the knowledge of 3d structural aspects of organic molecules and chemical reactions that are used in the synthesis of organic molecules.	3	-	-	2	-	-	-	-	-	-	-	-	-	-	-
4	Substantiate the various processes involved in thermodynamic considerations and its involvement in electrochemical aspects.	3	-	-	-	-	-	-	3	-	3	-	-	-	-	-
5	Aware of spectroscopic techniques in the field of molecular identification of materials.	3	-	-	2	-	3	-	-	-	3	-	-	-	-	-
Average		3	-	-	2.0	-	3.0	-	3.0	-	3.0	-	-	-	-	-

Semester-II															
18CS101 - Fundamentals of Problem Solving and C Programming															
		Program Outcomes												**Program Specific Outcomes**		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Formulate and apply logic to solve basic problems.	3	3	3	3	3	2	2	1	1	1	3	3	3	2	-
2	Write, compile and debug programs in c language.	3	3	3	3	3	2	2	1	1	1	3	3	3	2	-
3	Apply the concepts such as arrays, decision making and looping statements to solve real time applications.	3	3	3	3	3	2	2	1	1	1	3	3	3	1	-
4	Solve simple scientific and statistical problems using functions and pointers.	3	3	3	3	3	2	2	1	1	1	3	3	3	1	-
5	Write programs related to structures and unions for simple applications.	3	3	3	3	3	2	2	1	1	1	3	3	3	1	-
Average		3	3	3	3	3	2	2	1	1	1	3	3	3	1.4	-

Semester-II
18EN102 - Professional English Laboratory

	Course Outcomes	Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Infer, interpret and correlate routine, classroom-related conversation.	-	-	1	1	-	1	1	2	1	3	1	2	-	1	3
2	Use a range of common vocabulary and context based idioms.	-	-	1	2	-	1	1	2	2	3	1	1	-	1	2
3	Comprehend native speakers when they speak quickly to one another, although the student might still have trouble.	-	-	1	1	-	-	1	2	1	3	2	1	-	-	1
4	Identify the most important words in a story/article.	-	-	2	2	-	1	2	3	1	3	1	2	-	1	3
5	Summarize the main ideas, key details, and inferred meanings from listening passages of up to five minutes.	-	-	1	1	-	-	1	1	1	3	2	1	-	1	3
6	Vocalize words without the aid of pictures	-	-	1	1	-	1	1	2	-	3	1	2	-	-	2
7	Make effective self-introductions.	-	-	2	1	-	-	2	3	-	3	2	1	-	1	2
8	Study options, compare and contrasts the options.	-	-	2	2	-	-	2	2	1	3	2	-	-	1	3
9	Exercise a choice, justify it by giving examples and illustrations.	-	-	2	1	-	2	1	2	1	3	-	1	-	-	2
10	Construct a situation and to participate in conversations.	-	-	1	1	-	1	1	1	2	3	1	2	-	-	2
	Average	-	-	1.4	1.3	-	1.4	1.3	2	1.2	3	1.3	1.3	-	1.0	2.3

Semester-II															
18CS102 - Computer Practice Laboratory															
		Program Outcomes												Program Specific Outcomes		
	Course Outcomes	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Demonstrate the basic mechanics of word documents and working knowledge of mail merge.	3	3	3	3	3	2	2	1	1	1	3	3	3	2	-
2	Demonstrate the use of basic functions and formulas in spread sheet.	3	3	3	3	3	2	2	1	1	1	3	3	3	2	-
3	Apply good programming methods for program development.	3	3	3	3	3	2	2	1	1	1	3	3	3	1	-
4	Implement c programs for simple applications.	3	3	3	3	3	2	2	1	1	1	3	3	3	1	-
Average		3	3	3	3	3	2	2	1	1	1	3	3	3	1.5	-

Semester-II

18ME102 - Workshop Manufacturing Practices

	Course Outcomes	Program Outcomes												Program Specific Outcomes		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Prepare fitting of metal and wooden pieces using simple fitting and carpentry tools manually.	1	1	2	2	1	1	-	1	1	-	-	1	1	1	2
2	Prepare simple lap, butt and tee joints using arc welding equipment.	1	1	2	2	1	1	-	1	1	-	-	1	1	1	2
3	Prepare green sand moulding.	1	1	2	2	1	1	-	1	1	-	-	1	1	1	2
4	Prepare sheet metal components.	1	1	2	2	1	1	-	1	1	-	-	1	1	1	2
5	Prepare simple components using lathe and drilling machine.	1	1	2	2	1	1	-	1	1	-	-	1	1	1	2
	Average	1	1	2	2	1	1	-	1	1	-	-	1	1	1	2

Semester III															
18PH202 - Physics - Wave & Optics and Quantum Mechanics															
		Program Outcomes												**Program Specific Outcomes**		
	Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Understand simple harmonic oscillation and propagation of waves.	3	3	-	3	3	1	2	-	1	-	-	3	2	-	2
2	Apply matrix method to analyse system of reflecting and refracting surfaces.	3	3	-	2	2	1	-	-	1	-	-	3	2	-	2
3	Know various experimental techniques in wave optics.	2	3	-	2	3	1	1	-	1	-	-	3	1	-	2
4	Understand the concept of laser and its applications.	3	2	-	2	3	1	1	-	1	-	-	2	2	-	1
5	Gain knowledge in the basics of quantum mechanics.	3	3	-	2	3	1	1	-	1	-	-	3	2	-	2
Average		2.8	2.8	-	2.2	2.8	1	1.2	-	1	-	-	2.8	1.8	-	1.8

Semester III															
18MA204 - Fourier Series and Transforms															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Acquire the knowledge about fourier series	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Understand the techniques of solving boundary value problems	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
3	Familiar with the transform techniques.	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Average		2.3	2	1	1	1	1	1	1	1	1	1	1	1	1	1

	Semester III															
	18ME301 - Manufacturing Processes															
		Program Outcomes												**Program Specific Outcomes**		
	Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Understand various casting and moulding processes.	-	2	-	1	-	-	-	-	-	-	-	-	2	-	1
2	Familiar with welding processes	-	1	-	-	-	-	-	-	1	-	-	-	-	-	3
3	Understand various types of machining processes.	-	1	-	-	-	-	1	-	-	-	1	-	-	1	1
4	Gained knowledge about forming and shaping of plastics.	-	1	-	-	-	-	-	-	2	-	-	-	-	-	1
5	Understand various forming processes and principles of powder metallurgy.	-	1	-	-	-	-	-	-	1	-	-	-	-	-	1
	Average	-	1.2	-	1.0	-	-	1..0	-	1.3	-	1.0	-	2.0	1.0	1.4

Semester III															
18ME302 - Engineering Mechanics															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Illustrate the vectorial and scalar representation of forces and moments	2	2	-	-	-	-	-	-	-	-	-	-	1	1	-
2	Draw free body diagrams and write appropriate equilibrium equations firm free body diagram.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Evaluate the properties of surfaces and solids	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Analyze the systems that involve frictional forces.	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-
5	Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems	1	2	-	-	-	-	-	-	-	-	-	-	1	-	-
Average		1.2	1.5	-	-	-	-	-	-	-	-	-	-	1.0	1.0	-

Semester III															
18ME303 - Thermodynamics															
		Program Outcomes												**Program Specific Outcomes**		
Course 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.	1	3	1	2	1	1	1	-	-	-	-	-	1	2	1
2	Analyze the various work and heat interactions for different types of processes for closed and open systems.	2	1	1	2	3	1	1	-	-	-	-	-	1	3	1
3	Understand the properties of pure substance and concepts of rankine cycle.	2	1	3	1	2	1	1	-	-	-	-	-	2	1	3
4	Derive thermodynamic relations for ideal and real gases.	1	2	2	1	3	1	1	-	-	-	-	-	2	1	2
5	Understand the basic concepts of Psychrometry.	1	2	1	3	1	2	1	-	-	-	-	-	1	2	1
Average		1.4	1.8	1.6	1.8	2	1.2	1	-	-	-	-	-	1.4	1.8	1.6

Semester III															
18EC308 - Basic Electronics Engineering															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand the concepts of electronic components and circuits.	3	1	-	2	-	-	-	-	1	-	-	-	2	-	-
2	Understand the concepts of digital electronics.	3	1	-	2	-	-	-	-	1	-	-	-	2	-	-
3	Gain knowledge of integrated circuits.	3	2	1	2	-	-	-	-	1	-	-	-	2	-	-
4	Understand the fundamentals concepts of communication engineering.	3	2	1	2	-	-	-	-	1	-	-	-	2	-	2
5	Understand the concepts of electronic components and circuits.	3	1	-	2	-	-	-	-	1	-	-	-	2	-	-
Average		3	1.4	1.0	2	-	-	-	-	1	-	-	-	2	-	2.0

Semester III															
18ME304 - Manufacturing Technology Laboratory															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Acquire necessary skills to operate different machineries.	-	2	-	2	3	-	-	1	-	-	-	2	2	2	1
2	Perform machining time calculation in machining jobs.	3	2	3	2	-	-	-	1	-	-	-	-	1	1	2
Average		3.0	2	1.5	2	3.0	-	-	1	-	-	-	2.0	1.5	1.5	1.5

Semester III															
18EC309 - Electronics Laboratory															
	Program Outcomes													**Program Specific Outcomes**		
Course Outcomes		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Study experimentally the characteristics of diodes, bjt.	3	1	-	3	1	-	-	-	2	-	-	2	1	-	-
2	Demonstrate functional verification of combinational logic circuits	3	2	-	3	1	-	-	-	2	-	-	2	1	-	-
3	Demonstrate various applications of operational amplifier	3	1	-	3	1	-	-	-	2	-	-	2	1	-	-
Average		3	1.3	-	3	1	-	-	-	2	-	-	2	1	-	-

Semester IV															
18ME401 - Kinematics 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	Demonstrate and understanding of the concepts of various mechanisms and pairs.	3	3	2	2	1	-	-	-	-	-	-	-	3	2	-
2	Synthesize simple mechanisms for function, path generation and motion generation.	2	2	1	1	1	-	-	-	-	-	-	-	3	2	-
3	Develop CAM profiles	3	2	2	1	1	-	-	-	-	-	-	-	2	2	-
4	Analyze gears and gear trains	3	2	2	2	1	-	-	-	-	-	-	-	3	2	-
5	Examine friction in machine elements	2	1	2	1	1	-	-	-	-	-	-	-	2	3	-
Average		2.6	2	1.8	1.4	1	-	-	-	-	-	-	-	2.6	2.2	-

Semester IV															
18ME402 - Applied Thermodynamics															
		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 air standard cycles of internal combustion engines based on otto, diesel and dual cycles	3	1	-	-	-	-	-	-	-	-	-	-	3	1	1
2	Get an insight of various components of internal combustion engines.	3	3	2	3	-	-	-	-	-	-	-	-	3	2	1
3	Apply thermodynamic concepts in steam nozzles and turbines	3	2	3	1	-	2	-	-	-	-	-	-	3	2	1
4	Get an insight of various types of air compressors.	3	2	2	2	-	-	-	-	-	-	-	-	3	2	1
5	Design refrigeration and air conditioning system for applications.	3	-	-	-	-	1	-	-	-	-	-	-	3	3	1
Average		3	2.0	2.3	2.0	-	1.5	-	-	-	-	-	-	3	2	1

Semester IV															
18ME403 - Fluid Mechanics and Machinery															
	Program Outcomes												Program Specific Outcomes		
Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Understand the fundamental concepts of fluid mechanics	3	2	-	-	-	-	-	1	-	-	-	-	2	2	1
2	Apply the bernoulli equation to solve problems in fluid mechanics.	2	3	-	1	-	-	-	1	-	-	-	-	3	2	1
3	Understand the concepts of viscous flow and also have a knowledge in boundary layer concept.	3	1	-	1	-	-	-	-	-	-	-	1	2	2	1
4	Apply the principles of fluid mechanics to the design and operation of hydraulic pumps and turbines.	2	2	3	3	-	-	-	1	-	-	-	-	2	3	1
Average		2.5	2	3.0	1.6	-	-	-	1.0	-	-	-	1.0	2.2	2.2	1

Semester IV														
18ME404 - Strength of Materials														
	Program Outcomes												**Program Specific Outcomes**		
Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1 Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
2 Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment	2	2	1	1	-	-	-	-	-	-	-	-	1	2	-
3 Calculate the slope and deflection in beams using different methods.	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 Apply basic equation of simple torsion in designing of shafts and helical spring	2	2	2	2	-	-	-	-	-	-	-	-	2	-	1
Average	2.4	1.8	1.4	1.5	-	-	-	-	-	-	-	-	1.7	2.0	1.0

Semester IV															
18ME405 - Materials Engineering															
		Program Outcomes												**Program Specific Outcomes**		
Course 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	Describe properties, applications and types of various ferrous and non-ferrous metals used in fabrication industry.	1	-	2	1	1	2	1	-	-	-	-	-	2	3	1
3	Understand the principles of various heat treatment processes in fabrication industry.	-	1	1	1	1	-	1	-	-	-	-	-	3	2	1
4	Describe various types of failure and select suitable techniques for failure analysis.	-	2	2	1	1	1	1	-	-	-	-	-	2	3	1
Average		1.0	1.3	1.7	1.2	1	1.3	1	-	-	-	-	-	2.2	2.7	1

Semester IV															
10CYMC01 - Environmental Science															
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 about the major renewable energy systems and will investigate the environmental impact of various energy sources as well as the consequences of various pollutants.	-	-	2	-	-	2	-	-	1	-	-	1	-	-	2
2	Predict the methods to conserve energy and ways to make optimal use of the energy for the future	-	-	2	-	-	2	-	-	1	-	-	1	-	-	2
Average		-	-	2	-	-	2	-	-	1	-	-	1	-	-	2

Semester IV															
18ME406 - Strength of Materials and Fluid Mechanics Laboratory															
	Program Outcomes												**Program Specific Outcomes**		
Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1 Understand the various techniques of testing methods for materials.	2	3	2	-	1	-	-	-	-	-	-	-	2	2	1
2 Perform test and identify the different characteristics of materials.	2	3	2	1	1	-	-	-	-	-	-	-	2	2	1
3 Perform experiments on hydraulic machines to draw the performance characteristics.	3	2	2	1	1	-	-	-	-	-	-	-	2	2	1
Average	2.3	2.7	2	1.0	1	-	-	-	-	-	-	-	2	2	1

Semester IV															
18ME407 - 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	Apply thermodynamic theory to real thermodynamic cycles	2	3	2	-	1	-	-	-	-	-	-	-	2	2	1
2	Understand the knowledge on testing the properties of fuels and lubricating oils	2	3	2	1	1	-	-	-	-	-	-	-	2	2	1
3	Demonstrate the performance of internal combustion engines	3	2	2	1	1	-	-	-	-	-	-	-	2	2	1
	Average	2.3	2.7	2	1.0	1	-	-	-	-	-	-	-	2	2	1

		Semester – V														
		18ME501 - 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 basic concept of conduction, convection and radiation.	2	3	3	3	1	-	1	-	-	-	-	-	3	3	-
2	Analyze the extended surfaces and evaluate performance parameters	3	3	3	2	2	-	1	-	-	-	-	-	3	3	-
3	Design and analyze the performance of heat exchangers by using the method of LMTD and NTU	1	3	3	3	2	-	1	-	-	-	-	-	3	3	-
4	Understand the fundamental relationship between heat transfer and mass transfer.	2	1	3	1	-	-	-	-	-	-	-	-	3	2	-
Average		2	2.5	3	2.2	1.6	-	1.0	-	-	-	-	-	3	2.7	-

Semester – V														
18ME502 - Instrumentation and Control														
		Program Outcomes												**Program Specific Outcomes**		
Course 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.	2	1	-	-	-	-	-	-	-	-	-	-	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	-	-
3	Select, design appropriate signal processing to its instrumentation and control and their measurement	-	-	-	-	2	-	1	-	-	-	-	1	-	-	1
4	Understand and apply basic science, theory control theory and apply them to control engineering problems.	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-
5	Analyse the performance of systems and components through the use of analytical techniques	-	-	-	-	-	-	-	1	2	-	-	-	-	-	2
Average		1.5	1.0	2.0	2.0	2.0	-	1.5	1.0	2.0	-	-	1.0	1.5	-	1.5

Semester – V															
18ME503 - Metrology and Quality Control															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Demonstrate different measurement technologies and use of them in industrial component	3	2	2	1	-	-	-	-	-	-	-	-	1	-	-
2	Evaluate quality of job, machine and instruments.	2	1	2	2	1	-	-	-	-	-	-	-	2	-	-
3	Perform calibration of measuring instruments	2	2	1	2	-	-	2	-	-	-	-	-	-	-	-
4	Differentiate the accuracy of instruments.	2	2	1	1	-	-	-	-	-	-	-	1	-	-	-
Average		2.2	1.7	1.5	1.5	1.0	-	2.0	-	-	-	-	1.0	1.5	-	-

Semester – V															
18ME504 - 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	Perform static and dynamic analysis of simple mechanisms	2	2	3	2	1	-	-	-	-	-	1	-	3	2	1
3	Perform balancing of rotating and reciprocating masses	2	2	3	2	-	-	-	-	-	-	1	-	3	2	1
4	Model and analyse mechanical systems subjected to vibration	2	2	3	2	1	-	-	-	-	-	1	-	3	2	1
5	Study the various types of governors and its speed control mechanism	1	2	3	2	-	-	-	-	-	-	1	-	3	2	1
Average		1.8	2	3	2.2	1.0	-	-	-	-	-	1	-	3	2	1

Semester – V															
18MC301 - Indian Constitution															
		Program Outcomes												Program Specific Outcomes		
	Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Understand the emergence and evolution of the Indian Constitution	2	2	3	3	1	-	-	-	-	-	1	-	3	2	1
2	Explain the key concepts of Indian Political System	2	2	3	2	1	-	-	-	-	-	1	-	3	2	1
3	Describe the role of constitution in a democratic society.	2	2	3	2	-	-	-	-	-	-	1	-	3	2	1
4	Present the structure and functions of the Central and State Governments, the Legislature and the Judiciary	2	2	3	2	1	-	-	-	-	-	1	-	3	2	1
	Average	2	2	3	2.2	1.0	-	-	-	-	-	1	-	3	2	1

Semester – V															
18ME505 - Heat Transfer and Refrigeration Laboratory															
		Program Outcomes												**Program Specific Outcomes**		
Course Outcomes		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Demonstrate the conduction and convection heat transfer through experiments.	2	3	2	2	-	-	-	-	-	-	-	-	2	3	1
2	Evaluate heat transfer efficients for natural convection and Forced convention	2	2	3	1	-	-	-	-	-	-	-	-	2	3	1
3	Analyze heat exchanger performance using effectiveness method.	2	3	2	1	-	-	-	-	-	-	-	-	3	3	1
4	Calculate radiation heat exchange between black body and gray body surfaces.	2	2	3	3	-	-	-	-	-	-	-	-	3	2	1
5	Demonstrate the working principle of refrigeration and air-conditioning system	2	2	2	3	-	-	-	-	-	-	-	-	2	3	2
Average		2	2.4	2.4	2	-	-	-	-	-	-	-	-	2.4	2.8	1.2

Semester – V															
18EN501 - Communication Skills and Language Laboratory															
		Program Outcomes											Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Write error free letters and prepare reports	-	-	2	1	-	2	2	1	1	3	2	2	-	2	3
2	Deliver welcome address and vote of thanks	-	-	1	1	-	1	1	2	1	3	2	1	-	1	2
3	Speak coherently with proper pronunciation and accent	-	-	2	1	-	-	-	1	2	3	1	2	-	-	2
4	Avoid common idioms and grammatical errors	-	-	2	2	-	2	2	3	1	3	1	2	-	2	1
5	Improve repertoire of passive vocabulary	-	-	1	2	-	1	1	2	2	3	2	1	-	1	3
6	Answer questions posed by interviewers confidently	-	-	1	1	-	-	-	1	-	3	2	2	-	-	2
7	Participate in group discussion effectively	-	-	1	2	-	-	2	3	-	3	1	1	-	2	3
8	Undertake online psychometric and iq test to understand their strengths and weaknesses	-	-	2	2	-	-	2	1	1	3	2	-	-	1	3
Average		-	-	1.5	1.5	-	1.5	1.6	1.7	1.3	3	1.6	1.3	-	1.5	2.3

Semester – V															
18ME506 - 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	-	-	2	1	-	2	2	1	1	3	2	2	-	2	3
2	Perform measurements in quality impulsion	-	-	1	1	-	1	1	2	1	3	2	1	-	1	2
3	Avoid errors in measurement	-	-	2	1	-	-	-	1	2	3	1	2	-	-	2
4	Understand balancing of equipment	-	-	2	2	-	2	2	3	1	3	1	2	-	2	1
Average		-	-	1.8	1.3	-	1.6	1.6	1.8	1.3	3	1.5	1.8	-	1.6	2

Semester - VI															
18ME6010 Computer Integrated Manufacturing															
		Program Outcomes												Program Specific Outcomes		
	Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	Recognize the manufacturing activities interrelated with computers.	2	1	3	-	2	-	1	-	-	-	2	3	3	2	2
2	Understand the concept of group technology and the various approaches of computer aided process planning.	2	1	1	-	2	-	2	-	2	-	2	2	2	3	2
3	Explain the phases of shop floor control activities.	2	-	2	-	2	-	-	-	1	-	2	2	2	2	1
4	Apply the system modelling tools in cim	1	2	2	-	2	-	1	-	1	-	2	2	1	2	2
5	Explain the applications of database and system protocol	1	1	1	-	1	-	1	-	1	-	2	1	2	1	2
Average		1.6	1.2	1.8	-	1.8	-	1.2	-	1.2	-	2	2	2	2	1.8

Semester - VI															
18ME602 - Finite Element Analysis															
	Program Outcomes												**Program Specific Outcomes**		
Course Outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1 Perform the mathematical formulation of the finite element method and apply the same to basic (linear) ordinary and partial differential equations.	3	2	1	-	-	-	-	-	-	-	-	-	1	2	-
2 Develop and solve stiffness equations for 1d fea using bar, truss and beam elements.	3	2	1	-	-	-	-	-	-	-	-	-	2	1	-
3 Develop and solve stiffness equations for 2d fea using cst and other plane elements.	3	2	1	-	-	-	-	-	-	-	-	-	2	1	-
4 Implement the finite element method efficiently in order to solve simple structural problems	3	1	2	2	1	-	-	-	-	-	-	-	2	1	-
5 Solve the basic 1d and 2d heat transfer and fluid flow problems.	3	2	1	-	1	-	-	-	-	-	-	-	2	1	-
Average	3	1.8	1.2	2.0	1.0	-	-	-	-	-	-	-	1.8	1.2	-

Semester - VI															
18ME603 - 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.	3	3	3	2	-	-	-	-	-	-	-	-	3	2	-
2	Apply the concepts of design to shafts, keys and couplings.	3	2	2	1	-	-	-	-	-	-	-	-	2	2	-
3	Apply the concepts of design to temporary and permanent joints	3	2	2	2	-	-	-	-	-	-	-	-	2	2	-
4	Apply the concepts of design to various energy storing elements and engine components.	3	3	2	2	-	-	-	-	-	-	-	-	2	2	-
5	Design the various types of bearings and levers.	3	3	2	1	-	-	-	-	-	-	-	-	3	2	-
Average		3	2.6	2.2	1.6	-	-	-	-	-	-	-	-	2.4	2	-

Semester - VI															
18ME604 - CAD/CAM Laboratory															
		Program Outcomes												Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Understand how cad technology can be leveraged in the design process and the basic and advanced features available with cad software	1	2	-	1	3	-	-	-	-	1	-	1	1	1	1
2	Design a part or assembly of parts using computer-aided design software.	2	-	-	-	3	-	-	-	-	-	-	-	1	3	2
3	Understand the cnc concepts and manual part programming using g and m codes.	2	1	-	-	3	-	-	-	-	-	-	-	1	2	3
4	Understand modern cnc control systems (fanuc, siemens etc.) and application of various cnc machines.	2	1	-	-	3	-	-	-	-	-	-	-	1	2	3
5	Prepare cnc part programming and perform manufacturing.	2	2	-	1	2	-	-	-	-	-	-	-	1	2	3
Average		1.8	1.5	-	1.0	2.8	-	-	-	-	1.0	-	1.0	1	2	2.4

Semester - VI														
18ME605 - Mini Project														
	Program Outcomes												Program Specific Outcomes		
Course 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.	-	2	1	-	2	1	2	1	3	1	1	3	3	2	2
2	Create an environment to convert the ideas into design of prototype for useful industrial, agricultural and social applications.	2	2	3	1	3	2	2	1	2	1	-	3	1	2	3
Average	2	2	2	1	2.5	1.5	2	1	2.5	1	1	3	2	2	2.5

Semester - VII

18ME701 - 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	-	-	-	-	-	-	-	-	-	-	1	-	-
2	Develop a simulation model for simple physical systems and illustrate mechatronics design process.	-	-	2	-	1	-	-	-	-	-	-	-	-	2	-
3	Capable of designing, interfacing and understand issues of implementation of different actuation in a mechatronics system for a set of specifications.	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-
4	Understand how to interface electromechanical systems to plcs.	-	-	-	-	2	-	-	-	-	-	3	-	-	2	1
5	Understand how to interface electromechanical systems to plcs.	-	-	-	2	-	-	-	-	-	-	-	3	-	-	3
Average		1.0	2.0	2.0	1.5	1.5	-	2.0	-	-	-	3.0	3.0	1.0	2.0	2.0

Semester - VII															
18ME702 - Mechatronics and Simulation Laboratory															
		Program Outcomes												Program Specific Outcomes		
Course 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	Gain practical experience in data acquisition system and develop and evaluate alternate solutions to real world problems.	-	-	1	-	-	-	1	2	-	-	-	-	2	1	3
4	Use softwares as a tool for analyzing complex engineering problems.	-	-	-	3	-	-	-	-	-	-	2	3	2	1	3
5	Design, set up, and conduct engineering experiments and analyze the Results.	-	-	-	-	-	-	-	-	2	1	2	-	2	2	3
Average		1.0	3.0	1.0	2.5	-	-	1.0	2.0	2.0	1.0	2.0	3.0	1.6	1.4	2.4

Semester - VII

18ME703 - 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	To initiate and motivate the students to come out with innovative ideas for different applications.	-	2	1	-	2	1	2	1	3	1	1	3	3	2	2
2	To create an environment to convert the ideas into design of prototype for useful industrial, agricultural and social applications.	2	2	3	1	3	2	2	1	2	1	-	3	1	2	3
3	To create an environment to convert the design into manufacturing of prototype for useful industrial, agricultural and social applications.	1	2	3	2	3	2	2	2	2	2	1	3	2	3	3
	Average	1.5	2	2.3	1.5	2.7	1.7	2	1.3	2.3	1.3	1.0	3	2	2.3	2.7

Semester - VIII															
18ME701 - 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	To initiate and motivate the students to come out with innovative ideas for different applications	-	2	1	-	2	1	2	1	3	1	1	3	3	2	2
2	To create an environment to convert the ideas into design of prototype for useful industrial, agricultural and social applications.	2	2	3	1	3	2	2	1	2	1	-	3	1	2	3
3	To create an environment to convert the design into manufacturing of prototype for useful industrial, agricultural and social applications.	1	2	3	2	3	2	2	2	2	2	1	3	2	3	3
Average		1.5	2	2.3	1.5	2.7	1.7	2	1.3	2.3	1.3	1.0	3	2	2.3	2.7