#### VEL TECH MULTI TECH DR.RANGARAJAN DR.SAKUNTHALA ENGINEERING COLLEGE

#### DEPARTMENT OF MECHANICAL ENGINEERING

#### 2018 - 2022 BATCH (CO - PO & PS'O MAPPING)

01.11	Course	Common	Mapping with PO's										Mapping with PSO's				
SI NO	Code	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	HS8151	Communicative English	-	-	-	-	-	-	-	-	-	3	2	3	-	-	-
2	MA8151	Engineering Mathematics - I	3	3	2	2	-	-	-	-	-	-	-	2	-	1	2
3	PH8151	Engineering Physics	3	3	2	2	-	-	-	-	-	-	-	2	1	2	2
4	CY8151	Engineering Chemistry	3	3	2	2	-	2	2	2	-	-	-	2	-	1	-
5	GE8151	Problem Solving and Python Programming	3	3	3	2	2	-	-	-	-	-	-	1	-	1	2
6	GE8152	Engineering Graphics	3	3	3	3	-	-	-	2	-	2	-	2	1	2	-
7	GE8161	Problem Solving and Python Programming Laboratory	3	3	3	2	-	-	-	-	-	-	-	1	-	1	2
8	BS8161	Physics and Chemistry Laboratory	3	3	3	3	2	2	2	1	1	-	-	-	1	2	2
9	HS8251	Technical English	1	-	-	-	-	-	-	3	3	3	3	2	-	-	-
10	MA8251	Engineering Mathematics - II	3	3	3	3	-	-	-	-	-	-	-	2	-	2	1
11	PH8251	Materials Science	3	3	2	1	-	2	2	-	-	-	-	1	-	1	1
12	BE8253	Basic Electrical, Electronics and Instrumentation Engineering	3	3	3	2	-	-	-	-	-	-	-	2	1	2	-
13	GE8291	Environmental Science and Engineering	2	1	2	1	-	3	3	2	-	-	-	2	-	-	-
14	GE8292	Engineering Mechanics	3	3	3	3	-	-	-	-	-	-	-	2	2	3	-
15	GE8261	Engineering Practices Laboratory	3	1	2	-	1	1	-	-	2	-	-	-	1	1	1
16	BE8261	Basic Electrical. Electronics and Instrumentation Engineering Laboratory	3	3	2	2	2	1	-	-	2	-	-	1	1	1	-
17	MA8353	Transforms and Partial Differential Equations	3	3	3	2	-	-	-	-	-	-	-	3	-	1	-
18	ME8391	Engineering Thermodynamics	3	3	3	3	1	-	1	1	-	-	-	2	2	1	-
19	CE8394	Fluid Mechanics and Machinery	3	3	3	3	_	_	1	-	_	-	_	2	3	2	2
20	ME8351	Manufacturing Technology - I	3	3	2	-	2	1	-	_	_	-	_	2	3	3	2
20	EE8353	Electrical Drives and Controls	3	3	2	1	- 1	-	-	_	_	-	_	- 1	2	2	-
21	MF8361	Manufacturing Technology Laboratory - L	3	2	-	-	1	1			2	-	-	3	3	2	
22	ME8381	Computer Aided Machine Drawing	3	3	3	3	3	-			2	2	1	3	1	2	3
23	FF8361	Electrical Engineering Laboratory	3	3	3	2	2				2	-	-	1	1	1	5
24	H\$8381	Internersonal Skille / Listening & Speaking	-	-	-	-	2			2	-	3	2	3	-	-	
25	MA8452	Statistics and Numerical Methods	3	3	3	3	-	_		-	_	-	-	2	_		_
20	ME9402		2	2	3	3	-	_	-	_	-	-	_	2	2	-	-
27	ME0492	Minematics of Machinery	3	3	3	3	-	-	-	-	-	-	-	2	3	3	2
20	ME8401	Manufacturing Technology – 11	3	2	2	2	2	1	-	-	-	-	-	2	3	2	1
29	CE9205	Engineering Wetanungy	3	2	2	2	1	1	-	-	-	-	-	2	-	2	1
30	CE0395	Strength of Materials for Mechanical Engineers	3	3	2	2	-	-	-	-	-	-	-	2	-	3	1
22	ME0493	Inermai Engineering- 1	3	3	3	2	1	-	-	-	-	-	-	1	-	2	-
32	CE0201	Manufacturing rechnology Laboratory - 11	3	2	2	2	2	-	-	-	2	-	-	1	3	2	1
33	CE0301		3	2	2	2	2	-	-	-	2	-	-	2	2	3	1
34	NE8505	The second reading and writing	-	-	-	-	2	2	-	2	2	3	-	3	-	-	-
35	ME6595		3	3	2	2	2	-	-	-	-	-	-	1	2	2	1
36	ME8593	Design of Machine Elements	3	3	3	2	2	-	-	1	-	-	-	2	2	2	1
37	ME8501	Metrology and Measurements	3	1	2	1	2	-	-	1	2	-	-	2	-	2	1
38	ME8594	Dynamics of Machines	3	3	3	3	-	-	-	-	-	-	-	2	2	3	2
39	ORO551	Kenewable Energy Sources (Open Elective 1)	3	2	2	2	-	2	2	1	-	-	-	3	-	2	-
40	ME8511	Kinematics and Dynamics Laboratory	3	3	2	2	2	-	-	-	2	-	-	1	3	3	3
41	ME8512	Thermal Engineering Laboratory	3	3	2	2	2	-	2	-	2	-	-	2	1	2	1
42	ME8513	Metrology and Measurements Laboratory	3	3	2	2	2	-	-	-	2	-	-	2	-	2	1
43	ME8651	Design of Transmission Systems	3	3	2	2	-	-	-	-	-	-	-	2	3	2	1
44	ME8691	Computer Aided Design and Manufacturing	3	3	3	3	3	-	-	-	2	2	1	2	1	2	2

SI No	Course	Course						Mapping	with PO's	8					Mapping with PSO's			
51 140	Code	Collise	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
45	ME8693	Heat and Mass Transfer	3	3	2	2	-	-	-	-	-	-	-	2	-	2	2	
46	ME8692	Finite Element Analysis	3	3	3	2	2	-	-	-	-	-	-	3	1	2	1	
47	ME8694	Hydraulics and Pneumatics	3	2	1	2	2	-	-	-	-	-	-	3	2	2	1	
48	ME8091	Automobile Engineering	3	2	2	1	2	1	2	-	-	-	-	2	1	2	2	
49	ME8681	CAD / CAM Laboratory	3	2	2	2	3	-	-	-	2	-	2	2	-	2	2	
50	ME8682	Design and Fabrication Project	3	3	3	2	2	2	2	1	3	2	3	2	3	2	2	
51	HS8581	Professional Communication	-	-	-	-	-	1	-	2	1	3	1	3	-	-	-	
52	ME8792	Power Plant Engineering	3	2	2	2	1	-	2	1	-	-	-	3	-	2	2	
53	ME8793	Process Planning and Cost Estimation	2	2	2	2	-	1	-	-	-	-	1	2	-	-	1	
54	ME8791	Mechatronics	2	2	1	1	2	-	-	-	-	-	-	2	1	2	1	
55	OML751	Testing of Materials (Open Elective II )	3	2	2	2	2	-	-	1	-	-	-	2	1	1	1	
56	ME8073	Unconventional Machining Processes	3	1	1	1	-	1	1	1	-	1	-	1	-	2	1	
57	ME8097	Non Destructive Testing and Evaluation	3	2	2	2	2	-	-	2	-	-	-	2	-	1	2	
58	ME8711	Simulation and Analysis Laboratory	3	3	3	2	3	-	-	-	2	2	1	3	-	2	2	
59	ME8781	Mechatronics Laboratory	3	2	2	2	3	-	-	-	2	-	-	3	1	2	2	
60	ME8712	Technical Seminar	1	1	-	-	1	2	-	1	-	2	1	2	-	-	-	
61	MG8591	Principles of Management	1	-	-	-	-	2	-	2	-	1	-	2	-	-	-	
62	IE8693	Production Planning and Control	3	2	-	-	-	3	3	2	2	2	2	-	-	-	2	
63	ME8811	Project Work	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	
		Mapping	2.85	2.54	2.35	2.10	1.95	1.67	2.00	1.62	2.05	2.27	1.77	2.05	1.84	1.94	1.60	

# C101 Communicative English HS8151

After the completion of course, students will able to

COs	Course Outcome Statements
C101.1	Read articles of a general kind in magazines and newspapers.
C101.2	Participate effectively in informal conversations; introduce themselves and their friends
	and express opinions in English.
C101.3	Comprehend conversations and short talks delivered in English
C101.4	Write short essays of a general kind and personal letters and emails in English.
C101.5	Develop vocabulary of a general kind by developing their reading skills

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C101.1	0	0	0	0	0	0	0	0	0	3	2	3
C101.2	0	0	0	0	0	0	0	0	0	3	2	3
C101.3	0	0	0	0	0	0	0	0	0	3	2	3
C101.4	0	0	0	0	0	0	0	0	0	3	2	3
C101.5	0	0	0	0	0	0	0	0	0	3	2	3
CO	0	0	0	0	0	0	0	0	0	3	2	3

COs	PSO1	PSO2	PSO3
C101.1	0	0	0
C101.2	0	0	0
C101.3	0	0	0
C101.4	0	0	0
C101.5	0	0	0
CO	0	0	0

# C102 Engineering Mathematics – I MA8151

After the completion of course, students will able to

COs	Course Outcome Statements
C102.1	Define the derivative of a function and evaluate the derivative using rules of limits.
C102.2	Compute problems using the rules of differentiation and determine maxima and minima
	of functions involving more than one variable.
C102.3	Evaluate definite and indefinite integrals by using general integral formulas, integration
	by substitution, and integration tables.
C102.4	Compute area under a curve and the area between two curves using integration
	techniques.
C102.5	Analyse differential equations and solve by various techniques.

### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C102.1	3	3	2	2	0	0	0	0	0	0	0	2
C102.2	3	3	2	2	0	0	0	0	0	0	0	2
C102.3	3	3	2	2	0	0	0	0	0	0	0	2
C102.4	3	3	2	2	0	0	0	0	0	0	0	2
C102.5	3	3	2	2	0	0	0	0	0	0	0	2
СО	3	3	2	2	0	0	0	0	0	0	0	2

Cos	PSO1	PSO2	PSO3
C102.1	0	1	2
C102.2	0	1	2
C102.3	0	1	2
C102.4	0	1	2
C102.5	0	1	2
CO	0	1	2

# C103 Engineering Physics PH8151

After the completion of course, students will able to

COs	Course Outcome Statements
C103.1	To demonstrate the proficiency on the basics of properties of matter and its applications
C103.2	To acquire the essentials on the concepts of waves and optical devices and their
	applications in fibre optics
C103.3	To infer the conception of thermal properties of materials and their applications to
	recent trends of engineering
C103.4	To assimilate the of limits of classical theory and advanced physics concepts of
	quantum theory and its applications in electron microscope
C103.5	To analyze the structure of materials, basic concepts of crystalline materials and
	different crystal growth techniques

# **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C103.1	3	3	2	2	0	0	0	0	0	0	0	2
C103.2	3	3	2	2	0	0	0	0	0	0	0	2
C103.3	3	3	2	2	0	0	0	0	0	0	0	2
C103.4	3	3	2	2	0	0	0	0	0	0	0	2
C103.5	3	3	2	2	0	0	0	0	0	0	0	2
CO	3	3	2	2	0	0	0	0	0	0	0	2

Cos	PSO1	PSO2	PSO3
C103.1	1	2	2
C103.2	1	2	2
C103.3	1	2	2
C103.4	1	2	2
C103.5	1	2	2
CO	1	2	2

# C104 Engineering Chemistry CY8151

After the completion of course, students will able to

COs	Course Outcome Statements
C104.1	To assess the boiler troubles and the water softening methods
C104.2	To evaluate the surface catalysed chemical reactions for engineering applications.
C104.3	To appraise the importance of phase rules and alloy formation.
C104.4	To compare the chemical nature of various types of renewable and non-renewable
	energy resources and combustion behaviour of fuels.
C104.5	To evaluate the impact of different kind of energy resources and electrochemical
	storage devices.

### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C104.1	3	3	2	2	0	2	2	2	0	0	0	2
C104.2	3	3	2	2	0	2	2	2	0	0	0	2
C104.3	3	3	2	2	0	2	2	2	0	0	0	2
C104.4	3	3	2	2	0	2	2	2	0	0	0	2
C104.5	3	3	2	2	0	2	2	2	0	0	0	2
CO	3	3	2	2	0	2	2	2	0	0	0	2

Cos	PSO1	PSO2	PSO3
C104.1	0	1	0
C104.2	0	1	0
C104.3	0	1	0
C104.4	0	1	0
C104.5	0	1	0
CO	0	1	0

# C105 Problem Solving and Python Programming GE8151

After the completion of course, students will able to

COs	Course Outcome Statements
C105.1	Able to learn to think logically and write pseudo code or draw flow charts for problems
C105.2	Able to design C Programs for problems
C105.3	Able to use arrays, strings, functions, pointers, structures and unions in C
C105.4	The student should be able to execute C programs for simple applications
C105.5	Able to write C programs for simple applications
C105.6	Understand the use of functions and pointers to solve problems

#### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C105.1	3	3	3	2	2	0	0	0	0	0	0	1
C105.2	3	3	3	2	2	0	0	0	0	0	0	1
C105.3	3	3	3	2	2	0	0	0	0	0	0	1
C105.4	3	3	3	2	2	0	0	0	0	0	0	1
C105.5	3	3	3	2	2	0	0	0	0	0	0	1
C105.6	3	3	3	2	2	0	0	0	0	0	0	1
CO	3	3	3	2	2	0	0	0	0	0	0	1

Cos	PSO1	PSO2	PSO3
C105.1	0	1	2
C105.2	0	1	2
C105.3	0	1	2
C105.4	0	1	2
C105.5	0	1	2
C105.6	0	1	2
CO	0	1	2

# C106 Engineering Graphics GE8152

After the completion of course, students will able to

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COs	Course Outcome Statements
C106.1	Familiarize with the fundamentals and standards of Engineering graphics
C106.2	Perform freehand sketching of basic geometrical constructions and multiple views of
	objects.
C106.3	Project orthographic projections of lines and plane surfaces.
C106.4	Draw projections and solids and development of surfaces.
C106.5	Visualize and to project isometric and perspective sections of simple solids.

#### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C106.1	3	3	3	3	0	0	0	2	0	2	0	2
C106.2	3	3	3	3	0	0	0	2	0	2	0	2
C106.3	3	3	3	3	0	0	0	2	0	2	0	2
C106.4	3	3	3	3	0	0	0	2	0	2	0	2
C106.5	3	3	3	3	0	0	0	2	0	2	0	2
CO	3	3	3	3	0	0	0	2	0	2	0	2

Cos	PSO1	PSO2	PSO3
C106.1	1	2	0
C106.2	1	2	0
C106.3	1	2	0
C106.4	1	2	0
C106.5	1	2	0
	1	2	0

### C107 Problem Solving and Python Programming Laboratory GE8161

After the completion of course, students will able to

COs	Course Outcome Statements
C107.1	Make use of office package for documentation, presentation and visualization charts
C107.2	Sketch the flow chart for simple problems using problem solving skills
C107.3	Utilize decision making and looping statements for problem solving
C107.4	Apply the concept of array and string manipulation to implement sorting and searching
C107.5	Develop simple applications using structure and union

## **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C107.1	3	3	3	2	0	0	0	0	0	0	0	1
C107.2	3	3	3	2	0	0	0	0	0	0	0	1
C107.3	3	3	3	2	0	0	0	0	0	0	0	1
C107.4	3	3	3	2	0	0	0	0	0	0	0	1
C107.5	3	3	3	2	0	0	0	0	0	0	0	1
CO	3	3	3	2	0	0	0	0	0	0	0	1

Cos	PSO1	PSO2	PSO3
C107.1	0	1	2
C107.2	0	1	2
C107.3	0	1	2
C107.4	0	1	2
C107.5	0	1	2
CO	0	1	2

# C108 Physics and Chemistry Laboratory BS8161

COs	Course Outcome Statements
C108.1	To assimilate the basic principles of elastic behaviour of the materials towards recent
	trends in Engineering
C108.2	To attain basic understanding of physics concepts applied in thermal and electronic
	properties for engineering applications
C108.3	To acquire the knowledge of characterizing acoustics and optical waves and their
	applications in various engineering field
C108.4	To acquire knowledge on quantitative chemical analysis by instrumentation and volumetric
C108.5	Acquire knowledge about the determination of molecular weight of a polymer by
	viscometer

After the completion of course, students will able to

# **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C108.1	3	3	3	3	2	2	2	1	1	0	0	0
C108.2	3	3	3	3	2	2	2	1	1	0	0	0
C108.3	3	3	3	3	2	2	2	1	1	0	0	0
C108.4	3	3	3	3	2	2	2	1	1	0	0	0
C108.5	3	3	3	3	2	2	2	1	1	0	0	0
CO	3	3	3	3	2	2	2	1	1	0	0	0

Cos	PSO1	PSO2	PSO3
C108.1	1	2	2
C108.2	1	2	2
C108.3	1	2	2
C108.4	1	2	2
C108.5	1	2	2
CO	1	2	2

# C109 Technical English HS8251

After the completion of course, students will able to

COs	Course Outcome Statements
C109.1	Listen and comprehend scientific and technical lectures as well as online video lectures
	such as TED/ Ink and NTPEL
C109.2	Speak confidently and efficiently on day-to-day occurrences and also in technical
	presentations.
C109.3	Read technical and non-technical verbal and visual texts and comprehend messages of the
	texts by applying appropriate reading techniques and strategies
C109.4	Write clearly and coherently various types of reports, summary, job application, minutes,
	recommendation and checklists, graphs and charts, analytical essays to meet specific skills
	of academic and professional needs
C109.5	Effectively communicate to keep up with professional standards with maximum
	effectiveness.

### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C109.1	1	0	0	0	0	0	0	3	3	3	3	2
C109.2	1	0	0	0	0	0	0	3	3	3	3	2
C109.3	1	0	0	0	0	0	0	3	3	3	3	2
C109.4	1	0	0	0	0	0	0	3	3	3	3	2
C109.5	1	0	0	0	0	0	0	3	3	3	3	2
CO	1	0	0	0	0	0	0	3	3	3	3	2

Cos	PSO1	PSO2	PSO3
C109.1	0	0	0
C109.2	0	0	0
C109.3	0	0	0
C109.4	0	0	0
C109.5	0	0	0
CO	0	0	0

# C110 Engineering Mathematics – II MA8251

After the completion of course, students will able to

COs	Course Outcome Statements
C110.1	Evaluates system of linear equations by finding Eigen values, Eigen vectors and
	diagonalize symmetric matrices to demonstrate the nature of quadratic forms
C110.2	Assimilates the concepts of Vector Calculus and apply in various fields like, fluid flow and
	heat problems.
C110.3	Verifies the Cauchy-Riemann equations and analyze the properties of analytic, harmonic
	function and conformal mapping.
C110.4	Estimates complex line integrals and real integrals by Cauchy's Integral formula and
	Cauchy's residue theorem.
C110.5	Computes Laplace transforms of different type of functions, derivatives, integrals and
	differential equation which finds its application in various engineering fields.

### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C110.1	3	3	3	3	0	0	0	0	0	0	0	2
C110.2	3	3	3	3	0	0	0	0	0	0	0	2
C110.3	3	3	3	3	0	0	0	0	0	0	0	2
C110.4	3	3	3	3	0	0	0	0	0	0	0	2
C110.5	3	3	3	3	0	0	0	0	0	0	0	2
CO	3	3	3	3	0	0	0	0	0	0	0	2

Cos	PSO1	PSO2	PSO3
C110.1	0	2	1
C110.2	0	2	1
C110.3	0	2	1
C110.4	0	2	1
C110.5	0	2	1
CO	0	2	1

### C111 Materials Science PH8251

After the completion of course, students will able to

COs	Course Outcome Statements
C111.1	To examine the various phase diagrams and their importance in engineering applications
C111.2	To infer the specific analytical skills, pertinent to Fe-Fe3C phase diagram, various
	microstructures and alloys
C111.3	To identify the adequate conception of mechanical properties of materials and their
	measurement
C111.4	To analyze the significance of magnetic, dielectric and superconducting properties of
	materials in advanced engineering technologies
C111.5	To assimilate with current trends of the basics of ceramics, composites and nanomaterials

# **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C111.1	3	3	2	1	0	2	2	0	0	0	0	1
C111.2	3	3	2	1	0	2	2	0	0	0	0	1
C111.3	3	3	2	1	0	2	2	0	0	0	0	1
C111.4	3	3	2	1	0	2	2	0	0	0	0	1
C111.5	3	3	2	1	0	2	2	0	0	0	0	1
CO	3	3	2	1	0	2	2	0	0	0	0	1

Cos	PSO1	PSO2	PSO3
C111.1	0	1	1
C111.2	0	1	1
C111.3	0	1	1
C111.4	0	1	1
C111.5	0	1	1
CO	0	1	1

# C112 Basic Electrical, Electronics and Instrumentation Engineering BE8253

After the completion of course, students will able to

COs	Course Outcome Statements
C112.1	Analyze the DC Electrical Circuits.
C112.2	Analyze the AC Electrical Circuits.
C112.3	Explain the working principle & Performance Characteristics of Electrical Machines.
C112.4	Explain the Construction & Static Characteristics of Electronic devices and its Application
C112.5	Choose the Instrument for Electrical measurement for a specific application.

# **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C112.1	3	3	3	2	0	0	0	0	0	0	0	2
C112.2	3	3	3	2	0	0	0	0	0	0	0	2
C112.3	3	3	3	2	0	0	0	0	0	0	0	2
C112.4	3	3	3	2	0	0	0	0	0	0	0	2
C112.5	3	3	3	2	0	0	0	0	0	0	0	2
CO	3	3	3	2	0	0	0	0	0	0	0	2

Cos	PSO1	PSO2	PSO3
C112.1	1	2	0
C112.2	1	2	0
C112.3	1	2	0
C112.4	1	2	0
C112.5	1	2	0
CO	1	2	0

# C113 Environmental Science and Engineering GE8291

After the completion of course, students will able to

COs	Course Outcome Statements
C113.1	Assess the scope and importance of environmental science, various types of ecosystem,
	biodiversity and its conservation strategies.
C113.2	Appraise the imperative concept of hazardous nature, sources, effects and control measures
	of environmental pollution.
C113.3	Identify the environmental impacts of various types of natural resources and the use of
	renewable energy resources for sustainable future.
C113.4	Demonstrate the role of public participation for the protection of environment.
C113.5	Students can be able to evaluate the impacts of population growth in environment.

### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C113.1	2	1	2	1	0	3	3	2	0	0	0	2
C113.2	2	1	2	1	0	3	3	2	0	0	0	2
C113.3	2	1	2	1	0	3	3	2	0	0	0	2
C113.4	2	1	2	1	0	3	3	2	0	0	0	2
C113.5	2	1	2	1	0	3	3	2	0	0	0	2
CO	2	1	2	1	0	3	3	2	0	0	0	2

Cos	PSO1	PSO2	PSO3
C113.1	1	2	0
C113.2	1	2	0
C113.3	1	2	0
C113.4	1	2	0
C113.5	1	2	0
CO	1	2	0

# C114 Engineering Mechanics GE8292

After the completion of course, students will able to

COs	Course Outcome Statements
C114.1	Compute the resultant force for planar and spatial system of forces.
C114.2	Estimate the force, moment for planar and spatial system of forces
C114.3	Compute the centroid, second moment of area, center of gravity, product moment of inertia
	and mass moment of inertia.
C114.4	Compute the motion parameters like displacement, velocity, acceleration using dynamics
C114.5	Compute the reaction force by applying principles of friction and the motion parameters of
	rigid body.

#### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C114.1	3	3	3	3	0	0	0	0	0	0	0	2
C114.2	3	3	3	3	0	0	0	0	0	0	0	2
C114.3	3	3	3	3	0	0	0	0	0	0	0	2
C114.4	3	3	3	3	0	0	0	0	0	0	0	2
C114.5	3	3	3	3	0	0	0	0	0	0	0	2
CO	3	3	3	3	0	0	0	0	0	0	0	2

Cos	PSO1	PSO2	PSO3
C114.1	2	3	0
C114.2	2	3	0
C114.3	2	3	0
C114.4	2	3	0
C114.5	2	3	0
CO	2	3	0

# C115 Engineering Practices Laboratory GE8261

After the completion of course, students will able to

COs	Course Outcome Statements
C115.1	Able to explain the usage of plumbing and carpentry components of residential and
	industrial buildings
C115.2	Able to preparation of arc welding of butt joints, lap joints and tee joints
C115.3	Able to perform simple Turning and Taper turning, Able to make sheet metal Models like
	Trays, funnels, Able to identify parts of centrifugal pump and air conditioner
C115.4	Able to identify parts of electrical components and equipment's
C115.5	Able to fabricate electronics circuits
C115.6	Able to explain the components of upcoming engineering systems

# **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C115.1	3	1	2	0	1	1	0	0	2	0	0	0
C115.2	3	1	2	0	1	1	0	0	2	0	0	0
C115.3	3	1	2	0	1	1	0	0	2	0	0	0
C115.4	3	1	2	0	1	1	0	0	2	0	0	0
C115.5	3	1	2	0	1	1	0	0	2	0	0	0
C115.6	3	1	2	0	1	1	0	0	2	0	0	0
СО	3	1	2	0	1	1	0	0	2	0	0	0

Cos	PSO1	PSO2	PSO3
C115.1	1	1	1
C115.2	1	1	1
C115.3	1	1	1
C115.4	1	1	1
C115.5	1	1	1
C115.6	1	1	1
СО	1	1	1

# C116 Basic Electrical, Electronics and Instrumentation Engineering Laboratory BE8261

After the completion of course, students will able to

COs	Course Outcome Statements
C116.1	Relate various electronic devices
C116.2	Apply circuit theorems and concepts in engineering applications
C116.3	Demonstrate about Circuit components
C116.4	Discuss practical experience with simulation of electrical circuits and verifying circuit
	theorems
C116.5	Compare theorems and identify the proper application circuits
C116.6	Design RL and RC circuits

#### **Correlation of CO-PO**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C116.1	3	3	2	2	2	1	0	0	2	0	0	1
C116.2	3	3	2	2	2	1	0	0	2	0	0	1
C116.3	3	3	2	2	2	1	0	0	2	0	0	1
C116.4	3	3	2	2	2	1	0	0	2	0	0	1
C116.5	3	3	2	2	2	1	0	0	2	0	0	1
C116.6	3	3	2	2	2	1	0	0	2	0	0	1
СО	3	3	2	2	2	1	0	0	2	0	0	1

Cos	PSO1	PSO2	PSO3
C116.1	1	1	0
C116.2	1	1	0
C116.3	1	1	0
C116.4	1	1	0
C116.5	1	1	0
C116.6	1	1	0
CO	1	1	0

# C201 Transforms and Partial Differential Equations MA8353

After the completion of course, students will able to

COs	Course Outcome Statements
C201.1	Understand how to solve the given standard partial differential equations.
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.3	Appreciate the physical significance of Fourier series techniques in solving one- and two-dimensional heat flow problems and one-dimensional wave equations.
C201.4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C201.1	3	3	3	2	0	0	0	0	0	0	0	3
C201.2	3	3	3	2	0	0	0	0	0	0	0	3
C201.3	3	3	3	2	0	0	0	0	0	0	0	3
C201.4	3	3	3	2	0	0	0	0	0	0	0	3
C201.5	3	3	3	2	0	0	0	0	0	0	0	3
CO	3	3	3	2	0	0	0	0	0	0	0	3

COs	PSO1	PSO2	PSO3
C201.1	0	1	0
C201.2	0	1	0
C201.3	0	1	0
C201.4	0	1	0
C201.5	0	1	0
СО	0	1	0

# C202 Engineering Thermodynamics ME8391

After the completion of course, students will able to

COs	Course Outcome Statements
C202. 1	Apply the first law of thermodynamics for simple open and closed systems under steady.
C202. 2	Apply second law of thermodynamics to open and closed systems and calculate entropy.
C202. 3	Apply Rankine cycle to steam power plant and compare few cycle improvement
	methods.
C202. 4	Derive simple thermodynamic relations of ideal and real gases.
C202. 5	Calculate the properties of gas mixtures and moist air and its use in psychometrics.

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C202. 1	3	3	3	3	1	0	1	1	0	0	0	2
C202. 2	3	3	3	3	1	0	1	1	0	0	0	2
C202. 3	3	3	3	3	1	0	1	1	0	0	0	2
C202. 4	3	3	3	3	1	0	1	1	0	0	0	2
C202. 5	3	3	3	3	1	0	1	1	0	0	0	2
СО	3	3	3	3	1	0	1	1	0	0	0	2

COs	PSO1	PSO2	PSO3
C202. 1	2	1	0
C202. 2	2	1	0
C202. 3	2	1	0
C202. 4	2	1	0
C202. 5	2	1	0
СО	2	1	0

# C203 Fluid Mechanics and Machinery CE8394

After the completion of course, students will able to

COs	Course Outcome Statements
C203.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
C203.2	Analyse and calculate major and minor losses associated with incompressible fluid flow in piping networks.
C203.3	Calculate mathematically and predict the nature of physical quantities.
C203.4	Analyse the performance of hydraulic pumps.
C203.5	Analyse the performance of hydraulic turbines.

## **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C203.1	3	3	3	3	0	0	1	0	0	0	0	2
C203.2	3	3	3	3	0	0	1	0	0	0	0	2
C203.3	3	3	3	3	0	0	1	0	0	0	0	2
C203.4	3	3	3	3	0	0	1	0	0	0	0	2
C203.5	3	3	3	3	0	0	1	0	0	0	0	2
CO	3	3	3	3	0	0	1	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C203.1	3	2	2
C203.2	3	2	2
C203.3	3	2	2
C203.4	3	2	2
C203.5	3	2	2
CO	3	2	2

# C204 Manufacturing Technology-I - ME8351

COs	Course Outcome Statements
C204.1	Explain different Metal casting processes, associated defects, merits and
	demerits
C204.2	Compare different metal joining processes.
C204.3	Summarize various hot working and cold working methods of metals.
C204.4	Explain various sheet metal making processes.
C204.5	Distinguish various methods of manufacturing plastic components.

After the completion of course, students will able to

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C204.1	3	3	2	0	2	1	0	0	0	0	0	2
C204.2	3	3	2	0	2	1	0	0	0	0	0	2
C204.3	3	3	2	0	2	1	0	0	0	0	0	2
C204.4	3	3	2	0	2	1	0	0	0	0	0	2
C204.5	3	3	2	0	2	1	0	0	0	0	0	2
СО	3	3	2	0	2	1	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C204.1	3	3	2
C204.2	3	3	2
C204.3	3	3	2
C204.4	3	3	2
C204.5	3	3	2
СО	3	3	2

### C205 Electrical Drives and Controls EE8353

COs	Course Outcome Statements
C205.1	Analyse the rating and class of duty of machines for particular application of
	electrical drive and draw the heating and cooling curves.
C205.2	Explain the mechanical and electrical characteristics of DC and AC machines for
	particular application of electrical drive.
C205.3	Describe the starting methods of both DC and AC machines
C205.4	Classify conventional control and solid-state speed control for DC drives.
C205.5	Apply speed control on DC and AC drive by conventional and solid-state methods.

After the completion of course, students will able to

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C205.1	3	3	2	1	1	0	0	0	0	0	0	1
C205.2	3	3	2	1	1	0	0	0	0	0	0	1
C205.3	3	3	2	1	1	0	0	0	0	0	0	1
C205.4	3	3	2	1	1	0	0	0	0	0	0	1
C205.5	3	3	2	1	1	0	0	0	0	0	0	1
СО	3	3	2	1	1	0	0	0	0	0	0	1

COs	PSO1	PSO2	PSO3
C205.1	2	2	0
C205.2	2	2	0
C205.3	2	2	0
C205.4	2	2	0
C205.5	2	2	0
СО	2	2	0

# C206 Manufacturing Technology Laboratory - I- ME8361

COs	Course Outcome Statements
C206.1	Demonstrate the safety precautions exercised in the mechanical workshop.
C206.2	Make the workpiece as per given shape and size using Lathe.
C206.3	Join two metals using arc welding.
C206.4	Use sheet metal fabrication tools and make simple tray and funnel.
C206.5	Use different moulding tools, patterns and prepare sand moulds.

After the completion of course, students will able to

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C206.1	3	2	0	0	1	1	0	0	2	0	0	3
C206.2	3	2	0	0	1	1	0	0	2	0	0	3
C206.3	3	2	0	0	1	1	0	0	2	0	0	3
C206.4	3	2	0	0	1	1	0	0	2	0	0	3
C206.5	3	2	0	0	1	1	0	0	2	0	0	3
CO	3	2	0	0	1	1	0	0	2	0	0	3

COs	PSO1	PSO2	PSO3
C206.1	3	2	0
C206.2	3	2	0
C206.3	3	2	0
C206.4	3	2	0
C206.5	3	2	0
СО	3	2	0

# C207 Computer Aided Machine Drawing ME8381

After the completion of course, students will able to

COs	Course Outcome Statements
C207.1	Apply the drawing standards for mechanical components.
C207.2	Apply Fits and Tolerances for mechanical components.
C207.3	Re-create part drawings as per standards.
C207.4	Re-create sectional views as per standards.
C207.5	Re-create assembly drawings as per standards.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C207.1	3	3	3	3	3	0	0	0	2	2	1	3
C207.2	3	3	3	3	3	0	0	0	2	2	1	3
C207.3	3	3	3	3	3	0	0	0	2	2	1	3
C207.4	3	3	3	3	3	0	0	0	2	2	1	3
C207.5	3	3	3	3	3	0	0	0	2	2	1	3
CO	3	3	3	3	3	0	0	0	2	2	1	3

COs	PSO1	PSO2	PSO3
C207.1	1	3	3
C207.2	1	3	3
C207.3	1	3	3
C207.4	1	3	3
C207.5	1	3	3
СО	1	3	3

# C208 Electrical Engineering Laboratory EE8361

COs	Course Outcome Statements
C208.1	Perform load test and obtain speed characteristic of DC Shunt & DC Series
	motor and identify suitable starter.
C208.2	Perform load test and obtain speed characteristic of single phase transformer.
C208.3	Regulation of an alternator by EMF & MMF methods.
C208.4	Perform speed characteristic of synchronous motor.
C208.5	Perform load test on three phase squirrel cage Induction motor and speed
	control of three phase slip ring InductionMotor.

After the completion of course, students will able to

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C208.1	3	3	3	3	3	0	0	0	2	2	1	3
C208.2	3	3	3	3	3	0	0	0	2	2	1	3
C208.3	3	3	3	3	3	0	0	0	2	2	1	3
C208.4	3	3	3	3	3	0	0	0	2	2	1	3
C208.5	3	3	3	3	3	0	0	0	2	2	1	3
CO	3	3	3	3	3	0	0	0	2	2	1	3

COs	PSO1	PSO2	PSO3
C208.1	1	3	3
C208.2	1	3	3
C208.3	1	3	3
C208.4	1	3	3
C208.5	1	3	3
CO	1	3	3

# C209 Interpersonal Skills / Listening & Speaking HS8381

After the completion of course, students will able to

COs	Course Outcome Statements
C209.1	Listen and respond appropriately.
C209.1	Participate in group discussions.
C209.1	Make effective presentations.
C209.1	Participate confidently and appropriately in formal conversations.
C209.1	Participate confidently and appropriately in informal conversation.

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C209.1	0	0	0	0	2	0	0	2	0	3	2	3
C209.1	0	0	0	0	2	0	0	2	0	3	2	3
C209.1	0	0	0	0	2	0	0	2	0	3	2	3
C209.1	0	0	0	0	2	0	0	2	0	3	2	3
C209.1	0	0	0	0	2	0	0	2	0	3	2	3
CO	0	0	0	0	2	0	0	2	0	3	2	3

COs	PSO1	PSO2	PSO3
C209.1	0	0	0
C209.1	0	0	0
C209.1	0	0	0
C209.1	0	0	0
C209.1	0	0	0
СО	0	0	0

## C210 Statistics and Numerical Methods MA8452

COs	Course Outcome Statements
C210.1	Apply the concept of testing of hypothesis for small and large samples in real life
	problems.
C210.2	Analyse the basic concepts of Design of Experiments.
C210.3	Solve algebraic and transcendental equations and eigenvalue problems.
C210.4	Apply the numerical techniques of interpolation in various intervals and apply
	the numerical techniques of differentiation and integration for engineering problems
C210.5	Apply various techniques and methods for solving first and second order ordinary
	differential equations.

After the completion of course, students will able to

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C210.1	3	3	3	3	0	0	0	0	0	0	0	2
C210.2	3	3	3	3	0	0	0	0	0	0	0	2
C210.3	3	3	3	3	0	0	0	0	0	0	0	2
C210.4	3	3	3	3	0	0	0	0	0	0	0	2
C210.5	3	3	3	3	0	0	0	0	0	0	0	2
СО	3	3	3	3	0	0	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C210.1	0	0	0
C210.2	0	0	0
C210.3	0	0	0
C210.4	0	0	0
C210.5	0	0	0
CO	0	0	0

# C211 Kinematics of Machinery ME8492

After the completion of course, students will able to

COs	Course Outcome Statements
C211.1	Discuss the basics of mechanisms.
C211.2	Calculate velocity and acceleration in simple mechanisms.
C211.3	Develop CAM profiles.
C211.4	Solve problems on gears and gear trains.
C211.5	Examine friction in machine elements.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C211.1	3	3	3	3	0	0	0	0	0	0	0	2
C211.2	3	3	3	3	0	0	0	0	0	0	0	2
C211.3	3	3	3	3	0	0	0	0	0	0	0	2
C211.4	3	3	3	3	0	0	0	0	0	0	0	2
C211.5	3	3	3	3	0	0	0	0	0	0	0	2
CO	3	3	3	3	0	0	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C211.1	3	3	2
C211.2	3	3	2
C211.3	3	3	2
C211.4	3	3	2
C211.5	3	3	2
CO	3	3	2

# C212 Manufacturing Technology – II ME8451

After the completion of course, students will able to

COs	Course Outcome Statements
C212.1	Apply the concepts on theory of metal cutting.
C212.2	Analyse various operation in turning.
C212.3	Explain the working principles of machine tools.
C212.4	Elaborate on various surface finishing operations.
C212.5	Apply the knowledge of fundamentals of CNC Machine tools.

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C212.1	3	2	2	2	2	1	0	0	0	0	0	2
C212.2	3	2	2	2	2	1	0	0	0	0	0	2
C212.3	3	2	2	2	2	1	0	0	0	0	0	2
C212.4	3	2	2	2	2	1	0	0	0	0	0	2
C212.5	3	2	2	2	2	1	0	0	0	0	0	2
CO	3	2	2	2	2	1	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C212.1	3	2	1
C212.2	3	2	1
C212.3	3	2	1
C212.4	3	2	1
C212.5	3	2	1
CO	3	2	1

# C213 Engineering Metallurgy ME8491

COs	Course Outcome Statements
C213.1	Explain the basics of phase diagram and apply the knowledge of FeC
	diagram to understand the relationship between microstructure, properties
	and application of steel and cast iron.
C213.2	Apply the various heat treatment processes
C213.3	Explain the effect of alloying elements on ferrous alloys and non ferrous
	alloys.
C213.4	Elaborate the properties and application of polymers, ceramics and
	composites.
C213.5	Explain the mechanisms of deformation and fracture and also compare
	various methods to determine the mechanical properties.

After the completion of course, students will able to

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C213.1	3	2	2	2	1	1	0	0	0	0	0	2
C213.2	3	2	2	2	1	1	0	0	0	0	0	2
C213.3	3	2	2	2	1	1	0	0	0	0	0	2
C213.4	3	2	2	2	1	1	0	0	0	0	0	2
C213.5	3	2	2	2	1	1	0	0	0	0	0	2
CO	3	2	2	2	1	1	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C213.1	0	2	1
C213.2	0	2	1
C213.3	0	2	1
C213.4	0	2	1
C213.5	0	2	1
СО	0	2	1

# C214 Strength of Materials for Mechanical Engineers CE8395

COs	Course Outcome Statements
C214.1	Apply the concepts of stress, strain, principal stresses and principal planes.
C214.2	Explain the concept of shearing force and bending moment due to external
	loads in determinate beams and their effect on stresses.
C214.3	Determine stresses and deformation in circular shafts and helical spring due
	to torsion.
C214.4	Compute slopes and deflections in determinate beams by various methods.
C214.5	Analyze the stresses and deformations induced in thin and thick shells.
C214.6	Apply the concepts of stress, strain, principal stresses and principal planes.

After the completion of course, students will able to

**Correlation of CO-PO** 

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C214.1	3	3	2	2	0	0	0	0	0	0	0	2
C214.2	3	3	2	2	0	0	0	0	0	0	0	2
C214.3	3	3	2	2	0	0	0	0	0	0	0	2
C214.4	3	3	2	2	0	0	0	0	0	0	0	2
C214.5	3	3	2	2	0	0	0	0	0	0	0	2
C214.6	Lean	3	2	2	0	0	0	0	0	0	0	2
CO	3	3	2	2	0	0	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C214.1	0	3	1
C214.2	0	3	1
C214.3	0	3	1
C214.4	0	3	1
C214.5	0	3	1
СО	0	3	1

# C215 Thermal Engineering- I ME8493

After the completion of course, students will able to

COs	Course Outcome Statements
C215.1	Apply thermodynamic concepts to different air standard cycles and steam power
	cycles to solve problems.
C215.2	Solve problems related to single stage and multistage air compressors.
C215.3	Explain the functioning and features of IC engines, its components and its auxiliaries.
C215.4	Calculate performance parameters of IC Engines.
C215.5	Explain the flow in gas turbines and solve problems.

### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C215.1	3	3	3	2	1	0	0	0	0	0	0	1
C215.2	3	3	3	2	1	0	0	0	0	0	0	1
C215.3	3	3	3	2	1	0	0	0	0	0	0	1
C215.4	3	3	3	2	1	0	0	0	0	0	0	1
C215.5	3	3	3	2	1	0	0	0	0	0	0	1
CO	3	3	3	2	1	0	0	0	0	0	0	1

COs	PSO1	PSO2	PSO3
CO1	0	2	0
CO2	0	2	0
CO3	0	2	0
CO4	0	2	0
CO5	0	2	0
CO	0	2	0

# C216 Manufacturing Technology Laboratory – II ME8462

After the completion of course, students will able to

COs	<b>Course Outcome Statements</b>
C216.1	Use different machine tools to manufacturing.
C216.2	Use different machine tools to manufacturing gears.
C216.3	Use different machine tools for finishing operations.
C216.4	Manufacture tools using cutter grinder.
C216.5	Develop a CNC part programming.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C216.1	3	2	2	2	2	0	0	0	2	0	0	1
C216.2	3	2	2	2	2	0	0	0	2	0	0	1
C216.3	3	2	2	2	2	0	0	0	2	0	0	1
C216.4	3	2	2	2	2	0	0	0	2	0	0	1
C216.5	3	2	2	2	2	0	0	0	2	0	0	1
CO	3	2	2	2	2	0	0	0	2	0	0	1

COs	PSO1	PSO2	PSO3
C216.1	3	2	1
C216.2	3	2	1
C216.3	3	2	1
C216.4	3	2	1
C216.5	3	2	1
СО	3	2	1

# C217 Strength of Materials and Fluid Mechanics and Machinery Laboratory CE8381

After the completion of course, students will able to

COs	Course Outcome Statements
C217.1	Perform tension, torsion, hardness test on solid materials.
C217.2	Perform compression, and deformation test on solid materials.
C217.3	Use the measurement equipment for flow measurement.
C217.4	Perform test on different pumps.
C217.5	Perform test on different turbines.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C217.1	3	2	2	2	2	0	0	0	2	0	0	2
C217.2	3	2	2	2	2	0	0	0	2	0	0	2
C217.3	3	2	2	2	2	0	0	0	2	0	0	2
C217.4	3	2	2	2	2	0	0	0	2	0	0	2
C217.5	3	2	2	2	2	0	0	0	2	0	0	2
C217.1	3	2	2	2	2	0	0	0	2	0	0	2

COs	PSO1	PSO2	PSO3
C217.1	2	3	1
C217.2	2	3	1
C217.3	2	3	1
C217.4	2	3	1
C217.5	2	3	1
CO	2	3	1

# C218 Advanced Reading and Writing HS8461

After the completion of course, students will able to

COs	Course Outcome Statements
C218.1	Write different types of essays.
C218.2	Write winning job applications.
C218.3	Read and evaluate texts critically.
C218.4	Write project report and research proposals.
C218.5	Write Statement of Purpose, Letter of Recommendation, and Vision
	statement.

### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C218.1	0	0	0	0	2	2	0	2	2	3	0	3
C218.2	0	0	0	0	2	2	0	2	2	3	0	3
C218.3	0	0	0	0	2	2	0	2	2	3	0	3
C218.4	0	0	0	0	2	2	0	2	2	3	0	3
C218.5	0	0	0	0	2	2	0	2	2	3	0	3
CO	0	0	0	0	2	2	0	2	2	3	0	3

COs	PSO1	PSO2	PSO3
C218.1	0	0	0
C218.2	0	0	0
C218.3	0	0	0
C218.4	0	0	0
C218.5	0	0	0
CO	0	0	0

# C301 Thermal Engineering- II ME8595

After the completion of course, students will able to

COs	Course Outcome Statements
C301.1	Solve problems in Steam Nozzle
C301.1	Explain the functioning and features of different types of Boilers and
	auxiliaries and calculate performance parameters.
C301.1	Explain the flow in steam turbines, draw velocity diagrams for steam turbines
	and solve problems.
C301.1	Summarize the concept of Cogeneration, Working features of Heat pumps
	and Heat exchangers
C301.1	Solve problems using refrigerant table / charts and psychrometric charts

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C301.1	3	3	2	2	2	0	0	0	0	0	0	1
C301.1	3	3	2	2	2	0	0	0	0	0	0	1
C301.1	3	3	2	2	2	0	0	0	0	0	0	1
C301.1	3	3	2	2	2	0	0	0	0	0	0	1
C301.1	3	3	2	2	2	0	0	0	0	0	0	1
СО	3	3	2	2	2	0	0	0	0	0	0	1

COs	PSO1	PSO2	PSO3
C301.1	2	2	1
C301.1	2	2	1
C301.1	2	2	1
C301.1	2	2	1
C301.1	2	2	1
СО	2	2	1

# C302 Design of Machine Elements ME8593

After the completion of course, students will able to

COs	Course Outcome Statements
C302.1	Analyse machine elements based on steady and variable stresses.
C302.2	Design the shaft and coupling.
C302.3	Analyse temporary and permanent joint for given application
C302.4	Design and analyse Energy Storing Elements and Engine Components
C302.5	Design the Bearing element for desired applications.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C302.1	3	3	3	2	2	0	0	1	0	0	0	2
C302.2	3	3	3	2	2	0	0	1	0	0	0	2
C302.3	3	3	3	2	2	0	0	1	0	0	0	2
C302.4	3	3	3	2	2	0	0	1	0	0	0	2
C302.5	3	3	3	2	2	0	0	1	0	0	0	2
CO	3	3	3	2	2	0	0	1	0	0	0	2

COs	PSO1	PSO2	PSO3
C302.1	2	2	1
C302.2	2	2	1
C302.3	2	2	1
C302.4	2	2	1
C302.5	2	2	1
CO	2	2	1

# C303 Metrology and Measurements ME8501

After the completion of course, students will able to

COs	Explain the difference between accuracy and precision and also understand the
	sources of error.
C303.1	Describe the concepts of measurements to apply in various metrological instruments.
C303.2	Outline the principles of linear and angular measurement tools used for industrial applications.
C303.3	Explain the procedure for conducting computer aided inspection.
C303.4	Demonstrate the techniques of form measurement used for industrial components.
C303.5	Discuss various measuring techniques of mechanical properties in industrial applications.

### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C303.1	3	1	2	1	2	0	0	1	2	0	0	2
C303.1	3	1	2	1	2	0	0	1	2	0	0	2
C303.1	3	1	2	1	2	0	0	1	2	0	0	2
C303.1	3	1	2	1	2	0	0	1	2	0	0	2
C303.1	3	1	2	1	2	0	0	1	2	0	0	2
CO	3	1	2	1	2	0	0	1	2	0	0	2

COs	PSO1	PSO2	PSO3
C303.1	0	2	1
C303.1	0	2	1
C303.1	0	2	1
C303.1	0	2	1
C303.1	0	2	1
CO	0	2	1

# C304 Dynamics of Machines ME8594

COg	Course Outcome Statements
COS	Course Outcome Statements
C304.1	Explain gear parameters and kinematics of mechanisms.
C304.2	Use the effects of Balancing and undesirable effects of unbalances of masses for
	dynamic tests.
C304.3	Determine mass moment of inertia of mechanical element, range, sensitivity,
	natural frequency, damping coefficient, and torsional frequency for dynamic
	testing.
C304.4	Determine critical speeds of shafts, and transmissibility ratio in vibration tests.
C304.5	Determine the gyroscopic effect and governor effort.

After the completion of course, students will able to

## **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C304.1	3	3	3	3	0	0	0	0	0	0	0	2
C304.2	3	3	3	3	0	0	0	0	0	0	0	2
C304.3	3	3	3	3	0	0	0	0	0	0	0	2
C304.4	3	3	3	3	0	0	0	0	0	0	0	2
C304.5	3	3	3	3	0	0	0	0	0	0	0	2
CO	3	3	3	3	0	0	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C304.1	2	3	2
C304.2	2	3	2
C304.3	2	3	2
C304.4	2	3	2
C304.5	2	3	2
CO	2	3	2

# C305 Renewable Energy Sources (Open Elective I ) ORO551

After the completion of course, students will able to

COs	Explain the difference between accuracy and precision and also understand
	the sources of error.
C305.1	Discuss the importance and Economics of renewable Energy
C305.2	Discuss the method of power generation from Solar Energy
C305.3	Discuss the method of power generation from Wind Energy
C305.4	Explain the method of power generation from Bio Energy
C305.5	Explain the Tidal energy, Wave Energy, OTEC, Hydro energy, Geothermal
	Energy, Fuel Cells and Hybrid Systems.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C305.1	3	2	2	2	0	2	2	1	0	0	0	3
C305.1	3	2	2	2	0	2	2	1	0	0	0	3
C305.1	3	2	2	2	0	2	2	1	0	0	0	3
C305.1	3	2	2	2	0	2	2	1	0	0	0	3
C305.1	3	2	2	2	0	2	2	1	0	0	0	3
CO	3	2	2	2	0	2	2	1	0	0	0	3

COs	PSO1	PSO2	PSO3
CO1	0	2	0
CO2	0	2	0
CO3	0	2	0
CO4	0	2	0
CO5	0	2	0
CO	0	2	0

# C307 Kinematics and Dynamics Laboratory ME8511

COs	Course Outcome Statements
C307.1	Explain gear parameters, kinematics of mechanisms, gyroscopic effect and
	working of lab equipment.
C307.2	Determine mass moment of inertia of mechanical element, governor effort
	and range sensitivity, natural frequency and damping coefficient, torsional
	frequency, critical speeds of shafts, balancing mass of rotating and
	reciprocating masses, and transmissibility ratio.
C307.3	Determine the torsional natural frequency of single and Double Rotor
	systems & Undamped and Damped Natural frequencies.
C307.4	Determine the Vibration of Equivalent Spring mass system – undamped and
	damped vibration.
C307.5	Analysis the Balancing of rotating masses & balancing of reciprocating masses

After the completion of course, students will able to

### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C307.1	3	3	2	2	2	0	0	0	2	0	0	1
C307.2	3	3	2	2	2	0	0	0	2	0	0	1
C307.3	3	3	2	2	2	0	0	0	2	0	0	1
C307.4	3	3	2	2	2	0	0	0	2	0	0	1
C307.5	3	3	2	2	2	0	0	0	2	0	0	1
СО	3	3	2	2	2	0	0	0	2	0	0	1

COs	PSO1	PSO2	PSO3
C307.1	3	3	3
C307.2	3	3	3
C307.3	3	3	3
C307.4	3	3	3
C307.5	3	3	3
CO	3	3	3

#### C308 Thermal Engineering Laboratory ME8512

	-
COs	Course Outcome Statements
C308.1	conduct tests on heat conduction apparatus and evaluate thermal conductivity
	of materials.
C308.2	conduct tests on natural and forced convective heat transfer apparatus and
	evaluate heat transfer coefficient.
C308.3	conduct tests on radiative heat transfer apparatus and evaluate Stefan
	Boltzmann constant and emissivity.
C308.4	conduct tests to evaluate the performance of parallel/counter flow heat
	exchanger apparatus and reciprocating air compressor.
C308.5	conduct tests to evaluate the performance of refrigeration and air
	conditioning test rigs.

After the completion of course, students will able to

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C308.1	3	3	2	2	2	0	2	0	2	0	0	2
C308.2	3	3	2	2	2	0	2	0	2	0	0	2
C308.3	3	3	2	2	2	0	2	0	2	0	0	2
C308.4	3	3	2	2	2	0	2	0	2	0	0	2
C308.5	3	3	2	2	2	0	2	0	2	0	0	2
CO	3	3	2	2	2	0	2	0	2	0	0	2

COs	PSO1	PSO2	PSO3
C308.1	1	2	1
C308.2	1	2	1
C308.3	1	2	1
C308.4	1	2	1
C308.5	1	2	1
CO	1	2	1

COs	Course Outcome Statements
C309.1	Measure the gear tooth dimensions, angle using sine bar, straightness and
	flatness, thread parameters, temperature using thermocouple, force,
	displacement, torque and vibration.
C309.2	Calibrate the vernier, micrometer and slip gauges and setting up the
	comparator for the inspection.
C309.3	Calibration Non-contact (Optical) measurement using Toolmaker's
	microscope / Profile projector and Video measurement system
C309.4	Measurement of Surface finish turning, milling, grinding, etc.,) using stylus-
	based instruments.
C309.5	Calibration Testing of straightness of a machine tool guide way using
	Autocollimator, spindle tests.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C309.1	3	3	2	2	2	0	0	0	2	0	0	2
C309.2	3	3	2	2	2	0	0	0	2	0	0	2
C309.3	3	3	2	2	2	0	0	0	2	0	0	2
C309.4	3	3	2	2	2	0	0	0	2	0	0	2
C309.5	3	3	2	2	2	0	0	0	2	0	0	2
CO	3	3	2	2	2	0	0	0	2	0	0	2

COs	PSO1	PSO2	PSO3
C309.1	0	2	1
C309.2	0	2	1
C309.3	0	2	1
C309.4	0	2	1
C309.5	0	2	1
CO	0	2	1

COs	Explain the difference between accuracy and precision and also understand
	the sources of error.
C310.1	Apply the concepts of design to belts, chains and rope drives.
C310.2	Apply the concepts of design to spur, helical gears.
C310.3	Apply the concepts of design to worm and bevel gears.
C310.4	Apply the concepts of design to gear boxes .
C310.5	Apply the concepts of design to cams, brakes and clutches

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C310.1	3	3	2	2	0	0	0	0	0	0	0	2
C310.2	3	3	2	2	0	0	0	0	0	0	0	2
C310.3	3	3	2	2	0	0	0	0	0	0	0	2
C310.4	3	3	2	2	0	0	0	0	0	0	0	2
C310.5	3	3	2	2	0	0	0	0	0	0	0	2
CO	3	3	2	2	0	0	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C310.1	3	2	1
C310.2	3	2	1
C310.3	3	2	1
C310.4	3	2	1
C310.5	3	2	1
CO	3	2	1

COs	Course Outcome Statements
C311.1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing
	models and Metrics
C311.2	Explain the fundamentals of parametric curves, surfaces and Solids
C311.3	Summarize the different types of Standard systems used in CAD
C311.4	Apply NC & CNC programming concepts to develop part programme for Lathe
	& Milling Machines
C311.5	Summarize the different types of techniques used in Cellular Manufacturing and
	FMS

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C311.1	3	3	3	3	3	0	0	0	2	2	1	2
C311.2	3	3	3	3	3	0	0	0	2	2	1	2
C311.3	3	3	3	3	3	0	0	0	2	2	1	2
C311.4	3	3	3	3	3	0	0	0	2	2	1	2
C311.5	3	3	3	3	3	0	0	0	2	2	1	2
CO	3	3	3	3	3	0	0	0	2	2	1	2

COs	PSO1	PSO2	PSO3
C311.1	1	2	2
C311.2	1	2	2
C311.3	1	2	2
C311.4	1	2	2
C311.5	1	2	2
CO	1	2	2

COs	Explain the difference between accuracy and precision and also understand the
	sources of error.
C312.1	Apply heat conduction equations to different surface configurations under steady
	state and transient conditions and solve problems
C312.2	Apply free and forced convective heat transfer correlations to internal and external
	flows through/over various surface configurations and solve problems
C312.3	Explain the phenomena of boiling and condensation, apply LMTD and NTU
	methods of thermal analysis to different types of heat exchanger configurations and
	solve problems
C312.4	Explain basic laws for Radiation and apply these principles to radiative heat transfer
	between different types of surfaces to solve problems
C312.5	Apply diffusive and convective mass transfer equations and correlations to solve
	problems for different applications

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C312.1	3	3	2	2	0	0	0	0	0	0	0	2
C312.2	3	3	2	2	0	0	0	0	0	0	0	2
C312.3	3	3	2	2	0	0	0	0	0	0	0	2
C312.4	3	3	2	2	0	0	0	0	0	0	0	2
C312.5	3	3	2	2	0	0	0	0	0	0	0	2
СО	3	3	2	2	0	0	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C312.1	0	2	2
C312.2	0	2	2
C312.3	0	2	2
C312.4	0	2	2
C312.5	0	2	2
CO	0	2	2

COs	Course Outcome Statements
C313.1	Summarize the basics of finite element formulation.
C313.2	Apply finite element formulations to solve one dimensional Problems.
C313.3	Apply finite element formulations to solve two dimensional scalar Problems.
C313.4	Apply finite element method to solve two-dimensional Vector problems.
C313.5	Apply finite element method to solve problems on iso parametric element
	and dynamic Problems.

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C313.1	3	3	3	2	2	0	0	0	0	0	0	3
C313.2	3	3	3	2	2	0	0	0	0	0	0	3
C313.3	3	3	3	2	2	0	0	0	0	0	0	3
C313.4	3	3	3	2	2	0	0	0	0	0	0	3
C313.5	3	3	3	2	2	0	0	0	0	0	0	3
CO	3	3	3	2	2	0	0	0	0	0	0	3

COs	PSO1	PSO2	PSO3
C313.1	1	2	1
C313.2	1	2	1
C313.3	1	2	1
C313.4	1	2	1
C313.5	1	2	1
CO	1	2	1

COs	Explain the difference between accuracy and precision and also understand
	the sources of error.
C314.1	Explain the Fluid power and operation of different types of pumps.
C314.2	Summarize the features and functions of Hydraulic motors, actuators and
	Flow control valves
C314.3	Explain the different types of Hydraulic circuits and systems
C314.4	Explain the working of different pneumatic circuits and systems
C314.5	Summarize the various trouble shooting methods and applications of
	hydraulic and pneumatic systems.

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C314.1	3	2	1	2	2	0	0	0	0	0	0	3
C314.2	3	2	1	2	2	0	0	0	0	0	0	3
C314.3	3	2	1	2	2	0	0	0	0	0	0	3
C314.4	3	2	1	2	2	0	0	0	0	0	0	3
C314.5	3	2	1	2	2	0	0	0	0	0	0	3
CO	3	2	1	2	2	0	0	0	0	0	0	3

COs	PSO1	PSO2	PSO3
C314.1	2	2	1
C314.2	2	2	1
C314.3	2	2	1
C314.4	2	2	1
C314.5	2	2	1
CO	2	2	1

COs	Course Outcome Statements
C315.1	Recognize The Various Parts of The Automobile and Their Functions and
	Materials.
C315.2	Discuss The Engine Auxiliary Systems and Engine Emission Control.
C315.3	Distinguish The Working of Different Types of Transmission Systems.
C315.4	Explain The Steering, Brakes and Suspension Systems.
C315.5	Predict Possible Alternate Sources of Energy For IC Engines.

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C315.1	3	2	2	1	2	1	2	0	0	0	0	2
C315.2	3	2	2	1	2	1	2	0	0	0	0	2
C315.3	3	2	2	1	2	1	2	0	0	0	0	2
C315.4	3	2	2	1	2	1	2	0	0	0	0	2
C315.5	3	2	2	1	2	1	2	0	0	0	0	2
CO	3	2	2	1	2	1	2	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C315.1	1	2	2
C315.2	1	2	2
C315.3	1	2	2
C315.4	1	2	2
C315.5	1	2	2
CO	1	2	2

COs	Course Outcome Statements
C316.1	Draw 3D and Assembly drawing using CAD software
C316.2	Demonstrate manual part programming with G and M codes using CAM
C316.3	To Perform CL Data and Post process generation using CAM packages
C316.4	To study the Application of CAPP in Machining and Turning Centre.
C316.5	To study the application of various CNC machines like CNC lathe, CNC
	Vertical Machining centre, CNC EDM and CNC wire-cut and studying of
	Rapid prototyping.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C316.1	3	2	2	2	3	0	0	0	2	0	2	2
C316.2	3	2	2	2	3	0	0	0	2	0	2	2
C316.3	3	2	2	2	3	0	0	0	2	0	2	2
C316.4	3	2	2	2	3	0	0	0	2	0	2	2
C316.5	3	2	2	2	3	0	0	0	2	0	2	2
CO	3	2	2	2	3	0	0	0	2	0	2	2

COs	PSO1	PSO2	PSO3
C316.1	0	2	2
C316.2	0	2	2
C316.3	0	2	2
C316.4	0	2	2
C316.5	0	2	2
CO	0	2	2

COs	Course Outcome Statements
C317.1	Design and fabricate the machine element or the mechanical product.
C317.2	Demonstrate the working model of the machine element or the mechanical
	product.

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C317.1	3	3	3	2	2	2	2	1	3	2	3	2
C317.2	3	3	3	2	2	2	2	1	3	2	3	2
CO	3	3	3	2	2	2	2	1	3	2	3	2

COs	PSO1	PSO2	PSO3
C317.1	3	2	2
C317.2	3	2	2
CO	3	2	2

COs	Course Outcome Statements
C318.1	Make effective presentations
C318.2	Participate confidently in Group Discussions.
C318.3	Attend job interviews and be successful in them.
C318.4	Develop adequate Soft Skills required for the workplace

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C318.1	0	0	0	0	0	1	0	2	1	3	1	3
C318.2	0	0	0	0	0	1	0	2	1	3	1	3
C318.3	0	0	0	0	0	1	0	2	1	3	1	3
C318.4	0	0	0	0	0	1	0	2	1	3	1	3
CO	0	0	0	0	0	1	0	2	1	3	1	3

COs	PSO1	PSO2	PSO3
C318.1	0	0	0
C318.2	0	0	0
C318.3	0	0	0
C318.4	0	0	0
CO	0	0	0

COs	Course Outcome Statements
C401.1	Explain the layout, construction and working of the components inside a
	thermal power plant.
C401.2	Explain the layout, construction and working of the components inside a
	Diesel, Gas and Combined cycle power plants.
C401.3	Explain the layout, construction and working of the components inside
	nuclear power plants.
C401.4	Explain the layout, construction and working of the components inside
	Renewable energy power plants.
C401.5	Explain the applications of power plants while extend their knowledge to
	power plant economics and environmental hazards and estimate the costs of
	electrical energy production.

## **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C401.1	3	2	2	2	1	0	2	1	0	0	0	3
C401.2	3	2	2	2	1	0	2	1	0	0	0	3
C401.3	3	2	2	2	1	0	2	1	0	0	0	3
C401.4	3	2	2	2	1	0	2	1	0	0	0	3
C401.5	3	2	2	2	1	0	2	1	0	0	0	3
CO	3	2	2	2	1	0	2	1	0	0	0	3

COs	PSO1	PSO2	PSO3
C401.1	0	2	2
C401.2	0	2	2
C401.3	0	2	2
C401.4	0	2	2
C401.5	0	2	2
СО	0	2	2

COs	Course Outcome Statements
C405.1	select the process, equipment and tools for various industrial products.
C405.2	prepare process planning activity chart.
C405.3	explain the concept of cost estimation.
C405.4	compute the job order cost for different type of shop floor.
C405.5	calculate the machining time for various machining operations.

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C405.1	2	2	2	2	0	1	0	0	0	0	1	2
C405.2	2	2	2	2	0	1	0	0	0	0	1	2
C405.3	2	2	2	2	0	1	0	0	0	0	1	2
C405.4	2	2	2	2	0	1	0	0	0	0	1	2
C405.5	2	2	2	2	0	1	0	0	0	0	1	2
CO	2	2	2	2	0	1	0	0	0	0	1	2

COs	PSO1	PSO2	PSO3
C405.1	0	0	2
C405.2	0	0	2
C405.3	0	0	2
C405.4	0	0	2
C405.5	0	0	2
CO	0	0	2

COs	Course Outcome Statements
C402.1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and
	Computer Systems for the Control of Mechanical, Electronic Systems and sensor
	technology.
C402.2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram,
	Addressing Modes of Microprocessor and Microcontroller.
C402.3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various
	device interfacing
C402.4	Explain the architecture, programming and application of programmable logic
	controllers to problems and challenges in the areas of Mechatronic engineering.
C402.5	Discuss various Actuators and Mechatronics system using the knowledge and skills
	acquired through the course and also from the given case studies

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C402.1	2	2	1	1	2	0	0	0	0	0	0	2
C402.2	2	2	1	1	2	0	0	0	0	0	0	2
C402.3	2	2	1	1	2	0	0	0	0	0	0	2
C402.4	2	2	1	1	2	0	0	0	0	0	0	2
C402.5	2	2	1	1	2	0	0	0	0	0	0	2
СО	2	2	1	1	2	0	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C402.1	1	2	1
C402.2	1	2	1
C402.3	1	2	1
C402.4	1	2	1
C402.5	1	2	1
CO	1	2	1

COs	Course Outcome Statements
C403.1	Identify suitable testing technique to inspect industrial component
C403.2	Ability to use the different technique and know its applications and limitations
C403.3	Ability to different types of NDT technique.
C403.4	Study about material characterization process
C403.5	Ability to understand about different types of mechanical and metrological analysis

### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C403.1	3	2	2	2	2	0	0	1	0	0	0	3
C403.2	3	2	2	2	2	0	0	1	0	0	0	3
C403.3	3	2	2	2	2	0	0	1	0	0	0	3
C403.4	3	2	2	2	2	0	0	1	0	0	0	3
C403.5	3	2	2	2	2	0	0	1	0	0	0	3
CO	3	2	2	2	2	0	0	1	0	0	0	3

COs	PSO1	PSO2	PSO3
C403.1	2	1	1
C403.2	2	1	1
C403.3	2	1	1
C403.4	2	1	1
C403.5	2	1	1
CO	2	1	1

COs	Course Outcome Statements
C404.1	Explain the need for unconventional machining processes and its
	classification
C404.2	Compare various thermal energy and electrical energy based unconventional
	machining processes.
C404.3	Summarize various chemical and electro-chemical energy based
	unconventional machining processes.
C404.4	Explain various nano abrasives based unconventional machining processes.
C404.5	Distinguish various recent trends based unconventional machining processes.

### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C404.1	3	1	1	1	0	1	1	1	0	1	0	1
C404.2	3	1	1	1	0	1	1	1	0	1	0	1
C404.3	3	1	1	1	0	1	1	1	0	1	0	1
C404.4	3	1	1	1	0	1	1	1	0	1	0	1
C404.5	3	1	1	1	0	1	1	1	0	1	0	1
CO	3	1	1	1	0	1	1	1	0	1	0	1

#### **Correlation of CO-PSO**

Cos	PSO1	PSO2	PSO3
C404.1	0	2	1
C404.2	0	2	1
C404.3	0	2	1
C404.4	0	2	1
C404.5	0	2	1
CO	0	2	1

# C406 Non-Destructive Testing and Evaluation ME8097

After the completion of course, students will able to

COs	Course Outcome Statements
C406.1	Explain the fundamental concepts of NDT
C406.2	Discuss the different methods of NDE
C406.3	Explain the concept of Thermography and Eddy current testing
C406.4	Explain the concept of Ultrasonic Testing and Acoustic Emission
C406.5	Explain the concept of Radiograph

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C406.1	3	2	2	2	2	0	0	2	0	0	0	2
C406.2	3	2	2	2	2	0	0	2	0	0	0	2
C406.3	3	2	2	2	2	0	0	2	0	0	0	2
C406.4	3	2	2	2	2	0	0	2	0	0	0	2
C406.5	3	2	2	2	2	0	0	2	0	0	0	2
CO	3	2	2	2	2	0	0	2	0	0	0	2

COs	PSO1	PSO2	PSO3
C406.1	0	1	2
C406.2	0	1	2
C406.3	0	1	2
C406.4	0	1	2
C406.5	0	1	2
CO	0	1	2

COs	Course Outcome Statements
C408.1	Perform the Structural analysis on mechanical components.
C408.2	Perform the Modal analysis on mechanical components.
C408.3	Perform the Harmonic analysis on mechanical components.
C408.4	Perform the Thermal analysis on mechanical components.
C408.5	Perform the simulation on mechanical components using C/MATLAB.

# **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C408.1	3	3	3	2	3	0	0	0	2	2	1	3
C408.2	3	3	3	2	3	0	0	0	2	2	1	3
C408.3	3	3	3	2	3	0	0	0	2	2	1	3
C408.4	3	3	3	2	3	0	0	0	2	2	1	3
C408.5	3	3	3	2	3	0	0	0	2	2	1	3
CO	3	3	3	2	3	0	0	0	2	2	1	3

COs	PSO1	PSO2	PSO3
C408.1	0	2	2
C408.2	0	2	2
C408.3	0	2	2
C408.4	0	2	2
C408.5	0	2	2
CO	0	2	2

# C409 Mechatronics Laboratory ME8781

COs	Course Outcome Statements
C409.1	Demonstrate the functioning of mechatronics system with various pneumatic
	systems
C409.2	Demonstrate the functioning of mechatronics system with various hydraulic
	systems.
C409.3	Demonstrate the functioning of mechatronics system with various electrical
	systems.
C400.4	Demonstrate the functioning of control systems with the help of DLC and
C409.4	Demonstrate the functioning of control systems with the help of PLC and
	microcontrollers.
C409.5	Demonstrate the image processing technique.

After the completion of course, students will able to

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C409.1	3	2	2	2	3	0	0	0	2	0	0	3
C409.2	3	2	2	2	3	0	0	0	2	0	0	3
C409.3	3	2	2	2	3	0	0	0	2	0	0	3
C409.4	3	2	2	2	3	0	0	0	2	0	0	3
C409.5	3	2	2	2	3	0	0	0	2	0	0	3
CO	3	2	2	2	3	0	0	0	2	0	0	3

COs	PSO1	PSO2	PSO3
C409.1	1	2	2
C409.2	1	2	2
C409.3	1	2	2
C409.4	1	2	2
C409.5	1	2	2
CO	1	2	2

COs	Course Outcome Statements
C410.1	Upon completion of the course, students will be able to have clear
	understanding of managerial functions like planning, organizing, staffing,
	leading & controlling and have same basic knowledge on international aspect
	of management

### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C410.1	1	1	0	0	1	2	0	1	0	2	1	2
CO	1	1	0	0	1	2	0	1	0	2	1	2

COs	PSO1	PSO2	PSO3
C410.1	0	0	0
СО	0	0	0

COs	Course Outcome Statements
C417.1	Upon completion of the course, students will be able to have clear
	understanding of managerial functions like planning, organizing, staffing,
	leading & controlling and have same basic knowledge on international aspect
	of management

### **Correlation of CO-PO**

COs	<b>PO1</b>	PO2	PO3	<b>PO4</b>	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	PO10	PO11	PO12
C417.1	1	0	0	0	0	2	0	2	0	1	0	2
CO	1	0	0	0	0	2	0	2	0	1	0	2

COs	PSO1	PSO2	PSO3
C417.1	0	0	0
CO	0	0	0

COs	Course Outcome Statements
C418.1	Outline the fundamentals of production planning and production control.
C418.2	Apply work measurement techniques and methods study procedures for
	productivity improvement.
C418.3	Extend product information and infer steps in product planning.
C418.4	Solve Problems related to production scheduling.
C418.5	To discuss the effect of demand on inventories and outline recent trends in
	production process control.

#### **Correlation of CO-PO**

COs	<b>PO1</b>	PO2	PO3	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	PO10	PO11	PO12
C418.1	0	2	0	0	0	3	3	2	2	2	2	0
C418.2	0	2	0	0	0	3	3	2	2	2	2	0
C418.3	0	2	0	0	0	3	3	2	2	2	2	0
C418.4	0	2	0	0	0	3	3	2	2	2	2	0
C418.5	0	2	0	0	0	3	3	2	2	2	2	0
CO	0	2	0	0	0	3	3	2	2	2	2	0

COs	PSO1	PSO2	PSO3
C418.1	0	0	2
C418.2	0	0	2
C418.3	0	0	2
C418.4	0	0	2
C418.5	0	0	2
CO	0	0	2

COs	Course Outcome Statements
C420.1	On Completion of the project work students will be in a position to take up
	any challenging practical problems and find solution by formulating proper
	methodology.

### **Correlation of CO-PO**

COs	<b>PO1</b>	PO2	PO3	<b>PO4</b>	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	PO10	PO11	PO12
C420.1	3	3	3	3	3	3	3	3	3	3	3	3
CO	3	3	3	3	3	3	3	3	3	3	3	3

COs	PSO1	PSO2	PSO3
CO1	2	3	3
CO	2	3	3

COs	Course Outcome Statements
C421.1	To study the principles and basics of lean manufacturing.
C421.2	To understand the principles of cellular manufacturing and implementation ok
	KANBAN
C421.3	To learn about principles of TQM, and implementation of 5S Process
C421.4	To study working of SIX sigma and its implementation process
C421.5	To study various case studies on lean manufacturing process

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C421.1	3	2	2	1	0	0	0	0	0	0	0	2
C421.2	3	2	2	1	0	0	0	0	0	0	0	2
C421.3	3	2	2	1	0	0	0	0	0	0	0	2
C421.4	3	2	2	1	0	0	0	0	0	0	0	2
C421.5	3	2	2	1	0	0	0	0	0	0	0	2
CO	3	2	2	1	0	0	0	0	0	0	0	2

COs	PSO1	PSO2	PSO3
C418.1	1	1	1
C418.2	1	1	1
C418.3	1	1	1
C418.4	1	1	1
C418.5	1	1	1
CO	1	1	1

COs	Course Outcome Statements					
C422.1	Understand the construction and working principles of gas and arc welding process.					
C422.2	Understand the construction and working principles of resistance welding process.					
C422.3	Understand the construction and working principles of various solid state welding					
	process.					
C422.4	Understand the construction and working principles of various special welding					
	processes.					
C422.5	Understand the concepts on weld joint design, weldability and testing of weldments.					

#### **Correlation of CO-PO**

COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12
C422.1	3	2	2	2	2	2	0	2	0	0	0	2
C422.2	3	2	2	2	2	2	0	2	0	0	0	2
C422.3	3	2	2	2	2	2	0	2	0	0	0	2
C422.4	3	2	2	2	2	2	0	2	0	0	0	2
C422.5	3	2	2	2	2	2	0	2	0	0	0	2
CO	3	2	2	2	2	2	0	2	0	0	0	2

COs	PSO1	PSO2	PSO3
C418.1	0	1	0
C418.2	0	1	0
C418.3	0	1	0
C418.4	0	1	0
C418.5	0	1	0
CO	0	1	0