

## Department of Mechanical Engineering

**Subject Code/Name: - 4ME2-01/DATA ANALYTICS**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Describe Data Analytics and the skill sets need for a data analyst.
<b>CO-2</b>	Explain statistical inference and probability distributions commonly used as foundation for statistical modeling.
<b>CO-3</b>	Apply basic data analytics techniques: ANOVA, MANOVA, ANCOVA, MANCOVA, linear regression etc.
<b>CO-4</b>	Identify common approaches and algorithms for basic features selection, decision trees and factor analysis.
<b>CO-5</b>	Apply common approaches and algorithms used for Cluster analysis and Time series model.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
<b>I</b>	2	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>II</b>	2	2	-	-	-	-	-	-	-	-	-	-	-	-
<b>III</b>	2	2	-	3	-	-	-	-	-	-	-	-	2	-
<b>IV</b>	-	3	-	3	-	-	-	-	-	-	-	-	2	-
<b>V</b>	-	3	-	2	-	-	-	-	-	-	-	-	-	-
<b>AVG</b>	<b>2</b>	<b>3</b>	-	<b>3</b>	-	-	-	-	-	-	-	-	-	-

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

## Department of Mechanical Engineering

**Subject Code/Name: - 4ME1-02/TECHNICAL COMMUNICATION**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Acquisition of technical communication's generic aspects like Reading Technical Material, Technical Writing, Listening, Thinking and using technical phrases in spoken, Knowing the parts of a technical documents like screenshots, graphs, tabular data, data analysis, pictorial depiction.
<b>CO-2</b>	Getting adapted with the technical generic formats/templates of technical writing of memos, technical report writing, technical presentations, technical proposal writing, minutes of meeting and the notes taking techniques.
<b>CO-3</b>	Accessing the reading material and developing the writing technical material with the use of technical concepts and tools like Vacaroo, Microsoft Visio, Notepad ++, Kinemaster, Powtoon, Split Page Technique, Diagram Technique.
<b>CO-4</b>	Learning the skill of proofreading and copy editing, paraphrasing and spinning using technical tools and manually using the knowledge of advance technical grammar.
<b>CO-5</b>	Learning the technical phrases and writing styles like descriptive, argumentative etc for developing good technical documents for presentations or disseminating technical documents.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	<b>PO -1</b>	<b>PO -2</b>	<b>PO -3</b>	<b>PO -4</b>	<b>PO -5</b>	<b>PO -6</b>	<b>PO -7</b>	<b>PO -8</b>	<b>PO -9</b>	<b>PO -10</b>	<b>PO -11</b>	<b>PO -12</b>	<b>PSO -1</b>	<b>PSO -2</b>
<b>I</b>	-	-	-	-	-	-	-	-	1	3	-	1	-	2
<b>II</b>	-	-	-	-	-	-	-	-	1	3	-	1	-	2
<b>III</b>	-	-	-	-	-	-	-	-	1	3	-	1	-	2
<b>IV</b>	-	-	-	-	-	-	-	-	1	3	-	1	-	2
<b>V</b>	-	-	-	-	-	-	-	-	1	3	-	1	-	2
<b>AVG</b>	-	-	-	-	-	-	-	-	<b>1</b>	<b>3</b>	-	<b>1</b>	-	<b>2</b>

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

## Department of Mechanical Engineering

**Subject Code/Name: - 4ME3-04 DIGITAL ELECTRONICS**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Define the need for modulation and the basic communication system model
<b>CO-2</b>	Observe the concept of operational amplifiers and various applications of op-amp.
<b>CO-3</b>	Develop concept of simplification using Boolean and KMAP and design various combinational and sequential circuits
<b>CO-4</b>	Investigate the effect of feedback in practical circuits like Oscillators Multivibrators etc.
<b>CO-5</b>	Analyze the characteristics and application semiconductor devices.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
<b>I</b>	3	1	-	-	-	-	-	-	-	-	-	3	-	3
<b>II</b>	3	2	2	-	-	--	--	--	--	-	-	3	-	3
<b>III</b>	3	3	-	-	-	-	-	-	-	3	-	3	-	3
<b>IV</b>	3	3	3	-	-	-	-	-	-	-	-	3	-	3
<b>V</b>	3	3	2	-	-	-	-	-	-	1	-	3	-	3
<b>AVG</b>	<b>3</b>	<b>3</b>	<b>3</b>	-	-	-	-	-	-	<b>2</b>	-	<b>3</b>	-	<b>3</b>

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

## Department of Mechanical Engineering

**Subject Code/Name: - 4ME04-05 FLUID MECHANICS & FLUID MACHINES**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Define fluid and Understand Fluid properties, Buoyancy, stability of submerged and floating bodies, Manometer, and static fluid forces on different surfaces
<b>CO-2</b>	Understand various types of flow, Mass Momentum and energy conservation and related equations.
<b>CO-3</b>	Understand laminar and turbulent flow through pipes and parallel plates.
<b>CO-4</b>	Explain various applications of Bernoulli's Equation, Notches and Weirs, Orifices and Mouthpieces, Major and Minor losses in pipe flow, piping network, and draw HGL and TEL
<b>CO-5</b>	Understand and classify different Turbines and Pumps, plot curves for various efficiencies and draw velocity triangles for the same.

### MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PSO'S

<b>COURSE OUTCOMES</b>	<b>PROGRAM OUTCOMES</b>												<b>PSO's</b>	
	<b>PO- 1</b>	<b>PO- 2</b>	<b>PO- 3</b>	<b>PO- 4</b>	<b>PO- 5</b>	<b>PO- 6</b>	<b>PO- 7</b>	<b>PO- 8</b>	<b>PO- 9</b>	<b>PO- 10</b>	<b>PO- 11</b>	<b>PO- 12</b>	<b>PSO- 1</b>	<b>PSO- 2</b>
<b>CO-1</b>	3	-	-	-	-	-	-	-	-	-	-	-	-	3
<b>CO-2</b>	3	2	-	-	-	-	-	-	-	-	-	-	-	3
<b>CO-3</b>	3	-	-	-	-	-	-	-	-	-	-	-	-	3
<b>CO-4</b>	3	-	-	-	-	-	-	-	-	-	-	-	-	3
<b>CO-5</b>	3	4	-	-	-	-	-	-	-	-	-	-	-	3
<b>AVG</b>	3	2	-	-	-	-	-	-	-	-	-	-	-	3

**Note:** Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

## Department of Mechanical Engineering

**Subject Code/Name: - 4ME04-06 MANUFACTURING PROCESSES**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Understand the classification, scope and relative applications of basic manufacturing methods used in industries.
<b>CO-2</b>	Explain the different casting methods with their process details, applications and limitations.
<b>CO-3</b>	Understand the characteristics, process details and applications of rolling, forging, extrusion and drawing operations.
<b>CO-4</b>	Classify and explain in detail the different welding methods with brief introduction to brazing and soldering.
<b>CO-5</b>	Understand the powder metallurgy process with its typical advantages, limitations and industrial applications.

### MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

<b>COURSE OUTCOMES</b>	<b>PROGRAM OUTCOMES</b>												<b>PSO's</b>	
	<b>PO-1</b>	<b>PO-2</b>	<b>PO-3</b>	<b>PO-4</b>	<b>PO-5</b>	<b>PO-6</b>	<b>PO-7</b>	<b>PO-8</b>	<b>PO-9</b>	<b>PO-10</b>	<b>PO-11</b>	<b>PO-12</b>	<b>PS O-1</b>	<b>PS O-2</b>
<b>CO-1</b>	3	-	-	-	-	-	-	-	-	-	-	-	-	3
<b>CO-2</b>	3	3	2	-	-	-	-	-	-	-	-	-	-	3
<b>CO-3</b>	3	3	2	-	-	-	-	-	-	-	-	-	-	3
<b>CO-4</b>	2	3	2	-	-	-	-	-	-	-	-	-	-	3
<b>CO-5</b>	3	3	2	-	-	-	-	-	-	-	-	-	-	3
<b>AVG</b>	3	3	2	-	-	-	-	-	-	-	-	-	-	3

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

## Department of Mechanical Engineering

**Subject Code/Name: - 4ME04-07 THEORY OF MACHINES**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Explain Kinematic Chain, Mechanisms and their Inversions; analyze velocity and acceleration of various mechanisms.
<b>CO-2</b>	Solve problem-related to friction. Explain the principle and applications of clutch and brake.
<b>CO-3</b>	Explain details of gear tooth profiles and conditions of interference and undercutting. Explain different types of gear trains using analytical and tabular methods.
<b>CO-4</b>	Explain the principle and applications of a gyroscope. Explain and draw cam profile and velocity-acceleration analysis for different cams and followers
<b>CO-5</b>	Explain the principle and verify the practical vs. theoretical torque relation for gyroscope and its applications. Explain static and dynamic balancing.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	<b>PO -1</b>	<b>PO -2</b>	<b>PO -3</b>	<b>PO -4</b>	<b>PO -5</b>	<b>PO -6</b>	<b>PO -7</b>	<b>PO -8</b>	<b>PO -9</b>	<b>PO -10</b>	<b>PO -11</b>	<b>PO -12</b>	<b>PSO -1</b>	<b>PSO- 2</b>
<b>I</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>II</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>III</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>IV</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>V</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>AVG</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

## Department of Mechanical Engineering

**Subject Code/Name: - 4ME3-21 DIGITAL ELECTRONICS LAB**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Understand the pin description of digital IC's
<b>CO-2</b>	Implement Arithmetic logic circuits using digital IC's
<b>CO-3</b>	Implement combinational circuits using digital IC's.
<b>CO-4</b>	Apply concept of universal logic gates for digital circuit designing.
<b>CO-5</b>	Examine the behavior of sequential circuits using digital IC's

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	<b>PO -1</b>	<b>PO -2</b>	<b>PO -3</b>	<b>PO -4</b>	<b>PO -5</b>	<b>PO -6</b>	<b>PO -7</b>	<b>PO -8</b>	<b>PO -9</b>	<b>PO -10</b>	<b>PO -11</b>	<b>PO -12</b>	<b>PSO -1</b>	<b>PSO -2</b>
<b>I</b>	2	2	1	2	-	-	-	-	-	-	-	3	1	-
<b>II</b>	2	3	2	3	-	-	-	-	-	-	-	2	2	-
<b>III</b>	2	3	2	2	-	-	-	-	-	-	-	2	2	-
<b>IV</b>	2	2	2	2	-	-	-	-	-	-	-	2	1	-
<b>V</b>	2	2	3	2	-	-	-	-	-	-	-	2	2	-
<b>AVG</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>2</b>	<b>-</b>

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

## Department of Mechanical Engineering

**Subject Code/Name: - 4ME3-22 FLUID MECHANICS LAB**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Determine experimentally Metacentric height of the given body; and Cd, Cv & Cc of the given orifice.
<b>CO-2</b>	Calibrate experimentally the given rectangular notch or triangular notch, Venturimeter, Nozzle meter and Orifice meter and determine flow rate
<b>CO-3</b>	Stating Bernoulli's theorem with assumptions verify experimentally Bernoulli's theorem with the help of given experimental setup
<b>CO-4</b>	Determine and analyze major and minor pipe losses
<b>CO-5</b>	Explain and compare the working of various turbines, pipe fittings and manometers.

### MAPPING OF COURSE OBJECTIVE WITH PROGRAM OUTCOMES

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO's	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
<b>CO-1</b>	3	3	3	2	2	-	-	-	-	-	-	3	3	3
<b>CO-2</b>	3	3	3	3	2	-	-	-	-	-	-	3	3	2
<b>CO-3</b>	3	3	2	3	-	-	-	-	-	-	-	3	2	-
<b>CO-4</b>	3	2	2	2	-	-	-	-	-	-	-	3	2	-
<b>CO-5</b>	3	3	2	3	-	-	-	-	-	-	-	3	2	-
<b>AVG</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	-	-	-	-	-	-	<b>3</b>	<b>3</b>	<b>2.5</b>



## Department of Mechanical Engineering

**Note:** Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

### Subject Code/Name: - 4ME3-23 PRODUCTION PRACTICE LAB

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Exhibit understanding of the constructional features, working principle and operation performed on lathe, shaper, milling and grinding machine tool.
<b>CO-2</b>	Select appropriate cutting tools, suitable work & tool holding devices, optimum cutting parameters and safe working procedures on various machine tools.
<b>CO-3</b>	Measure various sand properties by performing sand moulding tests and prepare a green sand mould from a given split pattern.
<b>CO-4</b>	Perform the welding operation as per given drawing using TIG, MIG and SPOT welding techniques and exhibit use of safe working procedures and appropriate welding equipment's.
<b>CO-5</b>	Produce the part as per given drawing on lathe, shaper, milling and grinding machine tool and perform its error analysis.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
<b>I</b>	2	2	-	3	3	-	-	-	-	-	-	3	2	-
<b>II</b>	2	2	2	3	3	-	-	-	-	-	-	3	3	-
<b>III</b>	2	2	-	3	3	-	-	-	-	-	-	3	2	-
<b>IV</b>	2	2	3	3	3	-	-	-	-	-	-	3	3	-
<b>V</b>	2	-	2	-	3	-	-	-	-	-	-	2	2	-
<b>AVG</b>	2	2	2	3	3	-	-	-	-	-	-	3	2.4	-

## Department of Mechanical Engineering

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**Subject Code/Name: - 4ME3-24 THEORY OF MACHINES LAB**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Explain and discuss inversions of four bar, single slider and double slider chain. Steering Mechanisms- Davis and Ackerman; quick return mechanism and draw its velocity and acceleration diagrams.
<b>CO-2</b>	Explain and demonstrate cam and followers arrangements available in laboratory and plot displacement v/s angle of rotation curve for these.
<b>CO-3</b>	Determine co-efficient of friction of different materials using two roller oscillating arrangement and differentiate among.
<b>CO-4</b>	Describe, discuss and differentiate various types of dynamometers, Brakes, Clutches and Gear boxes with their applications
<b>CO-5</b>	Explain the principle and verify the practical vs. theoretical torque relation for gyroscope and its applications. Explain static and dynamic balancing.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	<b>PO -1</b>	<b>PO -2</b>	<b>PO -3</b>	<b>PO -4</b>	<b>PO -5</b>	<b>PO -6</b>	<b>PO -7</b>	<b>PO -8</b>	<b>PO -9</b>	<b>PO -10</b>	<b>PO -11</b>	<b>PO -12</b>	<b>PSO -1</b>	<b>PSO -2</b>
<b>I</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>II</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>III</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>IV</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-
<b>V</b>	3	-	-	-	-	-	-	-	3	-	-	3	-	-







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AVG	3	3	-	-	-	-	-	-	-	-	-	-	-	3
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**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Apply knowledge of design considerations such as variable loads, endurance stresses, size, surface finish, notch sensitivity, and stress concentration and design Shafts and Bolts under variable stresses.
<b>CO-2</b>	Design of various IC engine components including piston, cylinder, connecting rod and crank shaft.
<b>CO-3</b>	Design of helical springs like compression, tension, torsional and variable stresses; and design belt, rope and pulley drive systems.
<b>CO-4</b>	Design of spur, helical, bevel and worm gears under wear and dynamic load consideration using Lewis and Buckingham equations. Analyze bearing reactions due to gear tooth forces.
<b>CO-5</b>	Design of sliding and journal bearings for given hydrodynamic, hydrostatic, boundary, thermal equilibrium conditions and minimum film thickness of lubrication.
<b>CO-6</b>	Select anti-friction bearings for different loads and load cycles, mounting of the bearings, Method of lubrication.

**Subject Code/Name: - 6ME4-04 DESIGN OF MACHINE ELEMENT-II**

### MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES & PSO

COURSE OUTCOMES	PROGRAM OUTCOMES												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
<b>CO-1</b>	2	-	-	-	3	3	-	3	-	-	-	2	-	3
<b>CO-2</b>	-	3	3	-	3	3	-	3	-	-	-	2	-	3
<b>CO-3</b>	-	3	3	-	3	3	-	3	-	-	-	2	-	3
<b>CO-4</b>	-	3	3	-	3	3	-	3	-	-	-	2	-	3
<b>CO-5</b>	3	3	-	-	3	3	-	3	-	-	-	2	-	3
<b>CO-6</b>	3	3	3	-	3	-	-	3	-	-	-	2	-	3

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<b>AVG</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2</b>	<b>-</b>	<b>3</b>
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**Note:** Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

### Subject Code/Name: - 6ME4-05 QUALITY MANAGEMENT

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Describe the scope, outcomes, evolution and various philosophies of quality management and cost of quality.
<b>CO-2</b>	Analyze and interpret the process quality using various graphical and statistical tools like control charts, probability distribution, sampling distribution, hypothesis testing, DOE and acceptance sampling.
<b>CO-3</b>	Describe the leadership and various quality management systems including, FMEA, Six sigma, Quality audit and ISO 9000.
<b>CO-4</b>	Explain and analyze the product quality improvement using QFD, Robust design and Taguchi method.
<b>CO-5</b>	Apply the product reliability analysis methods for various system configurations.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	<b>PO -1</b>	<b>PO -2</b>	<b>PO -3</b>	<b>PO -4</b>	<b>PO -5</b>	<b>PO -6</b>	<b>PO -7</b>	<b>PO -8</b>	<b>PO -9</b>	<b>PO -10</b>	<b>PO -11</b>	<b>PO -12</b>	<b>PSO -1</b>	<b>PSO -2</b>
<b>I</b>	2	-	-	2	-	-	-	-	-	-	-	3	-	3
<b>II</b>	2	3	-	-	2	-	-	-	-	-	-	-	-	3
<b>III</b>	2	-	-	2	2	-	-	-	-	-	-	3	-	3
<b>IV</b>	2	3	-	2	2	-	-	-	-	-	-	-	-	-
<b>V</b>	2	3	-	2	-	-	-	-	-	-	-	3	-	3

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AVG	2	3	-	2	2	-	-	-	-	-	-	3	-	3
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**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**Subject Code/Name: - 6ME5- 11 REFRIGERATION & AIR CONDITIONING**

List of Course Outcomes	
<b>CO-1</b>	Analyze the reversed Carnot cycle and vapour compression refrigeration cycle (VCR).
<b>CO-2</b>	Select the air-refrigeration systems for aircraft, and vapour absorption refrigeration system for rural and remote areas and select environmental friendly refrigerants considering the international standards.
<b>CO-3</b>	Identify the Psychometric processes for different applications and design the parameters of air-conditioning system as per standards.
<b>CO-4</b>	Understand the human comfort, ASHRAE chart and concept of effective temperature.
<b>CO-5</b>	Estimate cooling load and heating load considering human comfort and optimize the air conditioning system as per requirements.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

COURSE OUTCOME	PROGRAM OUTCOME												PSO	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
<b>I</b>	3	3	-	-	-	-	-	-	-	-	-	-	-	-
<b>II</b>	3	3	3	-	-	3	3	-	-	-	-	-	-	-
<b>III</b>	-	3	3	-	-	3	3	-	-	-	-	-	-	-
<b>IV</b>	-	3	3	-	-	3	3	-	-	-	-	-	-	-







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<b>IV</b>	3	-	-	3	3	-	-	-	-	-	-	-	-	3
<b>V</b>	3	-	-	3	3	-	-	-	-	-	-	-	-	3
<b>AVG</b>	3	-	-	3	3	-	-	-	-	-	-	-	-	3

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

### 6ME4-23 MACHINE DESIGN PRACTICE-II

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Apply knowledge of design considerations in fatigue loading and analyze bolts under variable stresses
<b>CO-2</b>	Design the curved beams
<b>CO-3</b>	Design belt, rope and pulley drive
<b>CO-4</b>	Design spur, helical, bevel and worm gears under dynamic load conditions.
<b>CO-5</b>	Design of Sliding contact bearing and Anti-friction bearing under various load conditions.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	<b>PO -1</b>	<b>PO -2</b>	<b>PO -3</b>	<b>PO -4</b>	<b>PO -5</b>	<b>PO -6</b>	<b>PO -7</b>	<b>PO -8</b>	<b>PO -9</b>	<b>PO -10</b>	<b>PO -11</b>	<b>PO -12</b>	<b>PSO -1</b>	<b>PSO -2</b>
<b>I</b>	2	-	-	-	-	-	-	-	3	-	-	-	-	-
<b>II</b>	2	2	2	-	-	2	-	-	3	-	-	-	-	-

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<b>III</b>	2	2	2	-	-	2	-	-	3	-	-	-	-	-
<b>IV</b>	2	2	2	-	-	2	-	-	3	-	-	-	-	-
<b>V</b>	2	2	2	-	-	2	-	-	3	-	-	-	-	-
<b>AVG</b>	2	2	2	-	-	2	-	-	3	-	-	-	-	-

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

### 6ME4-24 THERMAL ENGINEERING LAB-I

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Identify and explain the different parts of petrol and diesel engines, and to draw valve timing diagrams.
<b>CO-2</b>	Explain and differentiate various types of boilers and identify and selection of required its mounting and accessories.
<b>CO-3</b>	Demonstrate the working of steering, braking and transmission systems of automobile and discuss the latest development.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	<b>PO -1</b>	<b>PO -2</b>	<b>PO -3</b>	<b>PO -4</b>	<b>PO -5</b>	<b>PO -6</b>	<b>PO -7</b>	<b>PO -8</b>	<b>PO -9</b>	<b>PO -10</b>	<b>PO -11</b>	<b>PO -12</b>	<b>PSO -1</b>	<b>PSO -2</b>
<b>I</b>	-	-	-	-	-	-	-	-	1	-	-	-	-	3
<b>II</b>	-	1	-	-	-	-	-	-	-	-	-	-	-	3
<b>III</b>	-	-	-	-	-	-	-	-	1	-	-	-	-	3











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<b>I</b>	2	1	-	2	-	-	-	-	3	3	-	-	-	3
<b>II</b>	2	1	-	2	-	-	-	-	3	3	-	-	-	3
<b>III</b>	2	1	-	2	-	-	-	-	3	3	-	-	-	3
<b>IV</b>	2	1	-	2	-	-	-	-	3	3	-	-	-	3
<b>V</b>	2	1	-	2	-	-	-	-	3	3	-	-	-	3
<b>AVG</b>	<b>2</b>	<b>1</b>	<b>-</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3</b>

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

### 8ME7-50 PROJECT

<b>List of Course Outcomes</b>	
<b>CO-1</b>	Define a problem and review literature to identify the gaps, objectives & scope of the work in project team in advanced areas of mechanical engineering.
<b>CO-2</b>	Analyze the problems of mechanical engineering to formulate objectives of project.
<b>CO-3</b>	Design a system, component, or process to meet the desired needs within certain realistic constraints such as economic, environmental, social, safety, manufacturability, and sustainability.
<b>CO-4</b>	Demonstrate the techniques, skills, and modern engineering tools necessary for engineering practice.
<b>CO-5</b>	Apply knowledge to solve engineering problem in multidisciplinary functional teams to communicate effectively and ethically.
<b>CO-6</b>	Prepare a professional report as per recommended format and defend the work.

### MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES AND PSO

<b>COURSE OUTCOME</b>	<b>PROGRAM OUTCOME</b>												<b>PSO</b>	
	<b>PO -1</b>	<b>PO -2</b>	<b>PO -3</b>	<b>PO -4</b>	<b>PO -5</b>	<b>PO -6</b>	<b>PO -7</b>	<b>PO -8</b>	<b>PO -9</b>	<b>PO -10</b>	<b>PO -11</b>	<b>PO -12</b>	<b>PSO -1</b>	<b>PSO -2</b>
<b>I</b>	3	3	-	-	-	-	-	-	3	-	-	2	3	3

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<b>II</b>	3	3	-	-	3	3	-	-	3	2	-	2	3	3
<b>III</b>	3	3	-	-	2	3	3	3	-	-	-	2	3	3
<b>IV</b>	-	-	3	2	3	3	-	3	-	-	-	2	3	3
<b>V</b>	-	3		-	3	3	-	3	-	2	-	2	3	3
<b>VI</b>	-	-	3	-	-	3		3	-	3		2	3	
<b>AVG</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>2</b>	<b>3</b>	<b>3</b>

**Note: Correlation levels 1, 2 or 3 as defined below:**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**