

COURSE OBJECTIVES

To develop in students, graphic skills for communication of concepts, ideas and design of Engineering Products
To expose them to existing national standards related to technical drawings.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C106.1	Familiarize with the fundamentals and standards of Engineering graphics	K3
C106.2	Perform freehand sketching of basic geometrical constructions and multiple views of objects.	K3
C106.3	Project orthographic projections of lines and plane surfaces.	K3
C106.4	Draw projections and solids and development of surfaces.	K3
C106.5	Visualize and to project isometric and perspective sections of simple solids	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C106.1	2	3	2	1	1	1	2	1	1	1	-	1	2	1
C106.2	2	3	2	1	1	1	2	1	1	1	-	1	2	1
C106.3	2	3	2	1	1	1	2	1	1	1	-	1	2	1
C106.4	2	3	2	1	1	1	2	1	1	1	-	1	2	1
C106.5	2	3	2	1	1	1	1	1	1	1	-	1	2	1
AVG	2	3	2	1	1	1	1.8	1	1	1		1	2	1



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COURSE OBJECTIVES

To develop capacity to predict the effect of force and motion in the course of carrying out the design functions of engineering

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C114.1	Illustrate the vectorial and scalar representation of forces and moments	K2
C114.2	Analyse the rigid body in equilibrium	K4
C114.3	Evaluate the properties of surfaces and solids	K4
C114.4	Calculate dynamic forces exerted in rigid body	K3
C114.5	Determine the friction and the effects by the laws of friction	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C114.1	3	3	1	1	-	-	1	-	-	-	-	-	1	-
C114.2	3	3	2	1	-	-	1	-	-	-	-	-	1	-
C114.3	3	2	2	-	-	-	1	-	-	-	-	-	1	-
C114.4	3	3	2	1	-	-	1	-	-	-	-	1	2	-
C114.5	3	3	2	2	-	-	1	-	-	-	-	1	1	-
AVG	3	2.8	1.8	1.25			1					1	1.2	



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COURSE OBJECTIVES

- To introduce the basic concepts of PDE for solving standard partial differential equations.
- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems.
- To acquaint the student with Fourier series techniques in solving heat flow problems used in various situations.
- To acquaint the student with Fourier transform techniques used in wide variety of situations.
- To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C201.1	Understand the mathematical principles on transforms and partial differential equations	K2
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications	K3
C201.3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.	K3
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.	K2
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C201.1	3	2	2	-	-	-	-	-	-	-	-	-	2	-
C201.2	2	1	1	-	-	-	-	-	-	-	-	-	1	-
C201.3	3	1	1	-	-	-	-	-	-	-	-	-	2	-
C201.4	2	1	1	-	-	-	-	-	-	-	-	-	1	-
C201.5	2	2	2	-	-	-	-	-	-	-	-	-	1	-
AVG	2.4	1.4	1.4										1.4	

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COURSE OBJECTIVES

- To familiarize the students to understand the fundamentals of thermodynamics and to perform thermal analysis on their behavior and performance.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C202.1	Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions.	K3
C202.2	Apply second law of thermodynamics to open and closed systems and calculate entropy and availability.	K3
C202.3	Apply Rankine cycle to steam power plant and compare few cycle improvement methods	K3
C202.4	Derive simple thermodynamic relations of ideal and real gases	K3
C202.5	Calculate the properties of gas mixtures and moist air and its use in psychometric processes	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1	3	2	1	1	-	1	1	-	-	-	-	1	1	1
C202.2	3	2	1	1	-	2	1	-	-	-	-	1	1	1
C202.3	3	2	1	1	-	2	1	-	-	-	-	-	2	1
C202.4	3	2	1	1	-	2	1	-	-	-	-	-	1	2
C202.5	3	2	1	1	-	2	1	-	-	-	-	1	1	2
AVG	3	2	1	1		1.8	1					1	1.2	1.4



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COURSE OBJECTIVES

The properties of fluids and concept of control volume are studied
The applications of the conservation laws to flow through pipes are studied.
To understand the importance of dimensional analysis
To understand the importance of various types of flow in pumps.
To understand the importance of various types of flow in turbines.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C203.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.	K3
C203.2	Can analyse and calculate major and minor losses associated with pipe flow in piping networks.	K4
C203.3	Can mathematically predict the nature of physical quantities	K3
C203.4	Can critically analyse the performance of pumps	K4
C203.5	Can critically analyse the performance of turbines.	K4

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C203.1	3	1	1	1	-	2	1	-	-	-	-	1	2	2
C203.2	3	2	-	2	-	1	-	-	-	-	-	1	2	2
C203.3	3	2	-	1	2	-	-	1	1	-	2	-	1	2
C203.4	3	2	1	2	-	2	2	1	1	-	-	1	2	2
C203.5	3	2	1	2	-	2	2	1	1	-	-	1	-	-
AVG	3.0	1.8	1.0	1.6	2.0	1.8	1.7	1.0	1.0		2.0	1.0	1.8	2.0



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COURSE OBJECTIVES

- To introduce the concepts of basic manufacturing processes and fabrication techniques, such as metal casting, metal joining, metal forming and manufacture of plastic components.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C204.1	Explain different metal casting processes, associated defects, merits and demerits	K2
C204.2	Compare different metal joining processes.	K2
C204.3	Summarize various hot working and cold working methods of metals.	K2
C204.4	Explain various sheet metal making processes.	K2
C204.5	Distinguish various methods of manufacturing plastic components.	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C204.1	3	2	2	-	-	1	1	1	-	-	-	1	2	2
C204.2	3	2	2	-	-	1	1	1	-	-	-	1	2	2
C204.3	3	2	2	-	-	1	1	1	-	-	-	1	2	2
C204.4	3	2	2	-	-	1	1	1	-	-	-	1	2	2
C204.5	3	2	2	-	-	1	1	1	-	-	-	1	2	2
AVG	3	2	2			1	1	1				1	2	2



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EE8353 ELECTRICAL DRIVES AND CONTROLS

COURSE OBJECTIVES

- To understand the basic concepts of different types of electrical machines and their performance.
- To study the different methods of starting D.C motors and induction motors.
- To study the conventional and solid-state drives

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C205.1	Describe the engineering fundamentals on Electric Drives , Selection of electrical drives and Loading conditions	K2
C205.2	Discuss the drive motor characteristics , Speed-Torque characteristics of various types of load and drive motors	K2
C205.3	Illustrate the Types of D.C Motor starters and Typical control circuits for shunt and series motors	K2
C205.4	Explain the basic knowledge on Conventional and solid state Speed control of DC series and shunt motors and its applications	K2
C205.5	Explain the basic knowledge on Conventional and solid state speed control of A.C. Drives and its applications	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C205.1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
C205.2	3	2	-	-	-	-	1	-	-	-	-	1	-	1
C205.3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C205.4	3	2	1	-	-	1	1	-	-	-	-	1	1	1
C205.5	3	2	1	-	-	1	1	-	-	-	-	1	1	1
AVG	2.8	2	1			1	1					1	1	1

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COURSE OBJECTIVES

- To Study and practice the various operations that can be performed in lathe, shaper, drilling, milling machines etc. and to equip with the practical knowledge required in the core industries.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C206.1	Demonstrate the safety precautions exercised in the mechanical workshop.	K3
C206.2	Make the workpiece as per given shape and size using Lathe.	K3
C206.3	Join two metals using arc welding.	K3
C206.4	Use sheet metal fabrication tools and make simple tray and funnel.	K3
C206.5	Use different moulding tools, patterns and prepare sand moulds.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C206.1	2	2	2	-	-	1	1	-	-	-	-	1	1	1
C206.2	2	2	2	-	-	1	1	-	-	-	-	1	1	1
C206.3	3	2	3	-	-	1	1	-	-	-	-	1	2	3
C206.4	3	2	3	-	-	1	1	-	-	-	-	1	2	3
C206.5	2	2	2	-	-	1	1	-	-	-	-	2	3	3
AVG	2.4	2	2.4			1	1					1.2	1.8	2.2



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COURSE OBJECTIVES

- To make the students understand and interpret drawings of machine components
- To prepare assembly drawings both manually and using standard CAD packages
- To familiarize the students with Indian Standards on drawing practices and standard components
- To gain practical experience in handling 2D drafting and 3D modeling software systems.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C207.1	Follow the drawing standards, Fits and Tolerances	K2
C207.2	Re-create part drawings, sectional views as per standards	K3
C207.3	Apply the drawing standards for 2D and 3D assembly drawings.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C207.1	2	2	3	3	-	-	-	-	-	-	-	-	3	1
C207.2	2	3	3	2	2	-	-	-	-	-	-	-	3	2
C207.3	-	2	3	2	-	-	-	-	-	-	-	-	3	1
AVG	2.0	2.3	3.0	2.3	2.0								3.0	1.3



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COURSE OBJECTIVES

- To validate the principles studied in theory by performing experiments in the laboratory

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C208.1	Ability to perform speed characteristic of different electrical machine	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C208.1	3	2	-	-	-	-	-	1	3	-	-	1	-	-
C208.2	3	2	-	-	-	-	-	1	3	-	-	1	-	-
C208.3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
AVG	3	2						1	3			1		



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COURSE OBJECTIVES

- Equip students with the English language skills required for the successful undertaking of academic studies with primary emphasis on academic speaking and listening skills.
- Provide guidance and practice in basic general and classroom conversation and to engage in specific academic speaking activities.
- improve general and academic listening skills
- Make effective presentations.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C209.1	• Listen and respond appropriately.	K3
C209.2	• Participate in group discussions	K2
C209.3	• Make effective presentations	K3
C209.4	• Participate confidently and appropriately in conversations both formal and informal	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C209.1	2	2	-	1	2	-	1	2	-	3	-	3	1	2
C209.2	2	1	-	1	-	2	2	1	3	2	-	-	1	2
C209.3	1	-	-	-	2	2	2	1	-	2	-	1	1	2
AVG	1.7	1.5		1.0	2.0	2.0	1.7	1.3	3.0	2.3		2.0	1.0	2.0

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COURSE OBJECTIVES

This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology.
To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.
To introduce the basic concepts of solving algebraic and transcendental equations.
To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines
To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C210.1	• Apply the concept of testing of hypothesis for small and large samples in real life problems.	K3
C210.2	• Apply the basic concepts of classifications of design of experiments in the field of agriculture.	K3
C210.3	• Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.	K3
C210.4	• Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.	K2
C210.5	• Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C210.1	2	1	1	1	-	-	-	-	-	-	2	-	2	-
C210.2	2	1	-	1	-	-	-	-	-	-	1	-	2	-
C210.3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C210.4	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C210.5	2	1	-	-	-	-	-	-	-	-	-	-	-	-
AVG	2	1	1	1							1.5		2	

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COURSE OBJECTIVES

- To understand the basic components and layout of linkages in the assembly of a system machine.
- To understand the principles in analyzing the assembly with respect to the displacement, velocity, and acceleration at any point in a link of a mechanism.
- To understand the motion resulting from a specified set of linkages, design few linkage mechanisms and cam mechanisms for specified output motions.
- To understand the basic concepts of toothed gearing and kinematics of gear trains and the effects of friction in motion transmission and in machine components.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C211.1	Discuss the basics of mechanism	K2
C211.2	Calculate velocity and acceleration in simple mechanisms	K4
C211.3	Develop CAM profiles	K4
C211.4	Solve problems on gears and gear trains	K3
C211.5	Examine friction in machine elements	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C211.1	3	2	1	1	1	-	-	-	-	-	-	-	3	2
C211.2	3	2	2	1	1	-	-	-	-	-	-	-	3	2
C211.3	3	2	1	1	1	-	-	-	-	-	-	-	3	2
C211.4	3	2	1	1	-	1	2	-	-	-	-	-	3	2
C211.5	3	2	1	1	-	1	2	-	-	-	-	-	3	2
AVG	3	2	1.2	1	1	1	2					1	3	2

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COURSE OBJECTIVES

- To understand the concept and basic mechanics of metal cutting, working of standard machine tools such as lathe, shaping and allied machines, milling, drilling and allied machines, grinding and allied machines and broaching.
- To understand the basic concepts of Computer Numerical Control (CNC) of machine tools and CNC Programming

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C212.1	Explain the mechanism of material removal processes.	K2
C212.2	Describe the constructional and operational features of centre lathe and other special purpose lathes.	K2
C212.3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.	K2
C212.4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.	K2
C212.5	Summarize numerical control of machine tools and write a part program.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C212.1	3	2	2	-	1	1	1	1	-	-	-	2	2	3
C212.2	3	2	2	-	1	1	1	1	-	-	-	2	2	3
C212.3	3	2	2	-	1	1	1	1	-	-	-	2	2	3
C212.4	3	2	2	-	1	1	1	1	-	-	-	2	2	3
C212.5	3	2	2	-	1	1	1	1	-	-	-	2	2	3
AVG	3.0	2.0	2.0		1.0	1.0	1.0	1.0				2.0	2.0	3.0

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COURSE OBJECTIVES

- To impart knowledge on the structure, properties, treatment, testing and applications of metals and non-metallic materials so as to identify and select suitable materials for various engineering applications.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C213.1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.	K2
C213.2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.	K2
C213.3	Clarify the effect of alloying elements on ferrous and non-ferrous metals	K3
C213.4	Summarize the properties and applications of non metallic materials.	K2
C213.5	Explain the testing of mechanical properties.	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C213.1	3	3	3	2	-	3	2	1	-	-	-	1	2	1
C213.2	3	3	3	1	-	3	2	1	-	-	-	1	1	1
C213.3	2	1	2	1	-	2	1	-	-	-	-	1	1	2
C213.4	2	1	2	1	1	-	1	-	-	-	-	1	1	1
C213.5	3	3	1	1	1	1	1	1	-	-	-	1	1	2
AVG	2.6	2.2	2.2	1.2	1.0	2.3	1.4	1.0				1.0	1.2	1.4



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COURSE OBJECTIVES

- To understand the concepts of stress, strain, principal stresses and principal planes.
- To study the concept of shearing force and bending moment due to external loads in determinate beams and their effect on stresses.
- To determine stresses and deformation in circular shafts and helical spring due to torsion.
- To compute slopes and deflections in determinate beams by various methods.
- To study the stresses and deformations induced in thin and thick shells.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C214.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.	K2
C214.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.	K2
C214.3	Apply basic equation of simple torsion in designing of shafts and helical spring	K3
C214.4	Calculate the slope and deflection in beams using different methods.	K3
C214.5	Analyze and design thin and thick shells for the applied internal and external pressures.	K4

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	3	2	1	1	-	1	1	-	-	-	-	1	2	1
C214.2	3	2	1	1	-	1	1	1	-	-	-	1	2	1
C214.3	3	2	1	1	-	1	-	1	-	-	-	1	2	1
C214.4	3	2	1	1	-	1	1	1	-	-	-	1	2	1
C214.5	3	2	1	1	-	1	-	1	-	-	-	-	2	1
AVG	3	2	1	1		1	1	1				1	2	1

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COURSE OBJECTIVES

- To integrate the concepts, laws and methodologies from the first course in thermodynamics into analysis of cyclic processes
- To apply the thermodynamic concepts into various thermal application like IC engines, Steam.
- Turbines, Compressors and Refrigeration and Air conditioning systems

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C215.1	Apply thermodynamic concepts to different air standard cycles and solve problems.	K3
C215.2	Solve problems in single stage and multistage air compressors	K3
C215.3	Explain the functioning and features of IC engines, components and auxiliaries.	K2
C215.4	Calculate performance parameters of IC Engines.	K3
C215.5	Explain the flow in Gas turbines and solve problems.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C215.1	3	3	1	1	1	-	-	1	-	-	-	1	3	1
C215.2	3	3	2	2	2	2	1	1	-	-	-	-	3	1
C215.3	3	3	2	2	3	1	2	1	-	-	1	2	3	2
C215.4	3	3	3	1	1	-	-	1	-	-	-	1	3	1
C215.5	3	3	1	2	-	-	1	1	-	-	1	1	3	1
AVG	3.0	3.0	1.8	1.6	1.8	1.5	1.3	1.0			1.0	1.3	3.0	1.2



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COURSE OBJECTIVES

- To Study and acquire knowledge on various basic machining operations in special purpose machines and its applications in real life manufacture of components in the industry.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C216.1	Use different machine tools to manufacturing gears	K3
C216.2	Ability to use different machine tools to manufacturing gears.	K3
C216.3	Ability to use different machine tools for finishing operations	K3
C216.4	Ability to manufacture tools using cutter grinder	K3
C216.5	Develop CNC part programming	K4

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C216.1	3	2	3	3	2	1	-	-	1	-	1	1	2	3
C216.2	3	2	3	2	2	-	-	-	-	-	-	-	2	3
C216.3	3	2	2	2	1	-	-	-	-	-	-	-	2	3
AVG	3.0	2.0	2.7	2.3	1.7	1.0			1.0		1.0	1.0	2.0	3.0

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DEPARTMENT OF MECHANICAL ENGINEERING

CE8381 STRENGTH OF MATERIALS AND FLUID MECHANICS AND MACHINERY LABORATORY

COURSE OBJECTIVES

- To study the mechanical properties of materials when subjected to different types of loading
- To verify the principles studied in Fluid Mechanics theory by performing experiments in lab

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C217.1	Perform Tension, Torsion on Solid materials Hardness, Compression Test	K3
C217.2	Perform Deformation test on Solid materials	K3
C217.3	Understand the mechanical properties of materials	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C217.1	3	1	-	1	-	-	-	-	-	-	-	-	2	2
C217.2	3	1	-	1	-	-	-	-	-	-	-	-	2	2
C217.3	-	-	-	-	-	-	-	-	-	-	-	-	-	2
AVG	3.0	1.0		1.0								3.0	2.0	1.7



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COURSE OBJECTIVES

- Strengthen the reading skills of students of engineering.
- Enhance their writing skills with specific reference to technical writing.
- Develop students' critical thinking skills.
- Provide more opportunities to develop their project and proposal writing skills.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C218.1	Write different types of essays.	K3
C218.2	Write winning job applications.	K3
C218.3	Read and evaluate texts critically.	K4
C218.4	Display critical thinking in various professional contexts.	K4

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C218.1	3	2	-	-	3	-		3	1	3	-	3	1	2
C218.2	2	-	-	-	-	2	3	-	-	2	-			2
C218.3	-	-	-	-	2	-	-	-	-	2	-	2	1	2
AVG	2.5	2.0			2.5	2.0	3.0	3.0	1.0	2.3		2.5	1.0	2.0



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DEPARTMENT OF MECHANICAL ENGINEERING

ME8595 THERMAL ENGINEERING – II

COURSE OBJECTIVES

- To apply the thermodynamic concepts for Nozzles, Boilers, Turbines, and Refrigeration & Air Conditioning Systems.
- To understand the concept of utilising residual heat in thermal systems.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C301.1	Solve problems in Steam Nozzle	K3
C301.2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters.	K2
C301.3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.	K2
C301.4	Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers	K2
C301.5	Solve problems using refrigerant table / charts and psychrometric charts	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301.1	3	3	1	2	1	1	1	-	-	-	-	-	3	2
C301.2	3	2	2	2	1	1	3	-	-	-	-	-	3	2
C301.3	3	2	2	2	1	1	1	-	-	-	-	-	3	2
C301.4	3	2	3	1	1	1	1	-	-	-	-	-	3	2
C301.5	3	2	1	2	1	1	3	-	-	-	-	-	3	2
AVG	3.0	2.2	1.8	1.8	1.0	1.0	1.8						3.0	2.0

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DEPARTMENT OF MECHANICAL ENGINEERING

ME8593 DESIGN OF MACHINE ELEMENTS

COURSE OBJECTIVES

- To familiarize the various steps involved in the Design Process
- To understand the principles involved in evaluating the shape and dimensions of a component to satisfy functional and strength requirements.
- To learn to use standard practices and standard data
- To learn to use catalogues and standard machine components
- (Use of P S G Design Data Book is permitted)

COURSE OUTCOMES

On successful completion of this course, the student will be able to			RBT
C302.1	Explain the influence of steady and variable stresses in machine component design.		K2
C302.2	Apply the concepts of design to shafts, keys and couplings.		K3
C302.3	Apply the concepts of design to temporary and permanent joints.		K3
C302.4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.		K3
C302.5	Apply the concepts of design to bearings.		K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C302.1	3	3	2	2	-	1	1	1	-	1	-	1	3	1
C302.2	3	3	2	2	-	1	1	1	-	1	-	1	3	1
C302.3	3	3	2	2	-	1	1	1	-	1	-	1	3	1
C302.4	3	3	2	2	-	1	1	1	-	1	-	1	3	1
C302.5	3	3	2	2	-	1	1	1	-	1	-	1	3	1
AVG	3	3	2	2		1	1	1		1		1	3	1



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COURSE OBJECTIVES

- To provide knowledge on various Metrological equipments available to measure the dimension of the components.
- To provide knowledge on the correct procedure to be adopted to measure the dimension of the components.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C303.1	Describe the concepts of measurements to apply in various metrological instruments	K2
C303.2	Outline the principles of linear and angular measurement tools used for industrial applications	K3
C303.3	Explain the procedure for conducting computer aided inspection	K2
C303.4	Demonstrate the techniques of form measurement used for industrial components	K3
C303.5	Discuss various measuring techniques of mechanical properties in industrial applications	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C303.1	2	2	1	-	-	-	1	-	-	-	-	-	2	2
C303.2	3	1	2	-	-	-	2	-	-	-	-	-	2	2
C303.3	2	1	1	-	1	-	2	-	-	-	-	1	2	3
C303.4	3	2	1	-	1	-	2	-	-	-	-	-	2	3
C303.5	3	1	2	-	-	-	2	-	-	-	-	-	2	3
AVG	2.6	1.4	1.4		1.0		1.8					1.0	2.0	2.4



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DEPARTMENT OF MECHANICAL ENGINEERING

ME8594 DYNAMICS OF MACHINES

COURSE OBJECTIVES

- To provide knowledge on various Metrological equipments available to measure the dimension of the components.
- To provide knowledge on the correct procedure to be adopted to measure the dimension of the components.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C304.1	Calculate static and dynamic forces of mechanisms.	K3
C304.2	Calculate the balancing masses and their locations of reciprocating and rotating masses.	K3
C304.3	Compute the frequency of free vibration.	K3
C304.4	Compute the frequency of forced vibration and damping coefficient.	K3
C304.5	Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C304.1	3	2	2	1	-	-	-	-	-	-	-	-	1	2
C304.2	3	1	2	1	-	-	-	-	-	-	-	-	1	2
C304.3	3	1	3	1	-	-	-	-	-	-	-	-	1	2
C304.4	3	1	3	1	-	-	-	-	-	-	-	-	1	2
C304.5	3	1	2	1	-	-	-	-	-	-	-	-	1	2
AVG	3.0	1.2	2.4	1.0									1.0	2.0



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DEPARTMENT OF MECHANICAL ENGINEERING

ORO551 RENEWABLE ENERGY SOURCES

COURSE OBJECTIVES

- At the end of the course, the students are expected to identify the new methodologies / technologies for effective utilization of renewable energy sources.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C305.1	Discuss the importance and Economics of renewable Energy	K2
C305.2	Discuss the method of power generation from Solar Energy	K2
C305.3	Discuss the method of power generation from Wind Energy	K2
C305.4	Explain the method of power generation from Bio Energy	K2
C305.5	Explain the Tidal energy, Wave Energy, OTEC, Hydro energy, Geothermal Energy, Fuel Cells and Hybrid Systems.	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	3	-	2	2	-	2	3	-	-	-	-	1	3	2
C305.2	2	2	-	-	-	1	2	-	-	-	2		3	2
C305.3	3	-	1	2	2	2	2	-	1	-	-	2	3	2
C305.4	2	-	2	-	2	2	2	-	-	1	-	-	3	2
C305.5	2	-	-	-	-	3	2	-	-	-	2	1	3	3
AVG	2.4	2.0	1.7	2.0	2.0	2.0	2.2		1.0	1.0	2.0	1.3	3.0	2.2



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COURSE OBJECTIVES

- To supplement the principles learnt in kinematics and Dynamics of Machinery.
- To understand how certain measuring devices are used for dynamic testing.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C306.1	Explain gear parameters, kinematics of mechanisms, gyroscopic effect and working of lab equipments.	K3
C306.2	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.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C306.1	2	3	2	3	-	-	-	-	-	-	-	-	3	1
C306.2	1	2	-	2	-	2	2	-	-	2	-	2	3	2
C306.3	2	2	3	2	-	-	-	-	-	-	-	-	3	2
AVG	1.7	2.3	2.5	2.3		2.0	2.0			2.0		2.0	3.0	1.7



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COURSE OBJECTIVES

- To study the value timing-V diagram and performance of IC Engines
- To Study the characteristics of fuels/Lubricates used in IC Engines
- To study the Performance of steam generator/ turbine
- To study the heat transfer phenomena predict the relevant coefficient using implementation
- To study the performance of refrigeration cycle / components

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C307.1	conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials.	K3
C307.2	conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.	K3
C307.3	conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.	K3
C307.4	conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.	K3
C307.5	conduct tests to evaluate the performance of refrigeration and air conditioning test rigs.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C307.1	3	3	2	2	1	-	-	-	-	-	-	-	3	1
C307.2	3	3	1	2	1	-	-	-	-	-	-	-	2	1
C307.3	3	3	2	1	1	-	-	-	-	-	-	-	3	1
AVG	3.0	3.0	1.7	1.7	1.0								2.7	1.0



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COURSE OBJECTIVES

- To familiar with different measurement equipments and use of this industry for quality inspection.

COURSE OUTCOMES

ME8513 METROLOGY AND MEASUREMENTS LABORATORY		
On successful completion of this course, the student will be able to		
		RBT
C308.1	Measure the gear tooth dimensions, angle using sine bar, straightness and flatness, thread parameters, temperature using thermocouple, force, displacement, torque and vibration.	K3
C308.2	Calibrate the vernier, micrometer and slip gauges and setting up the comparator for the inspection.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C308.1	2	2	2	2	-	1	2	1	1	-	-	-	1	1
C308.2	2	2	-	1	-	1	2	1	1	-	-	-	2	1
C308.3	2	2	-	1	-	1	1	1	1	-	-	-	1	1
AVG	2.0	2.0	2.0	1.3		1.0	1.7	1.0	1.0				1.3	1.0



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COURSE OBJECTIVES

- To gain knowledge on the principles and procedure for the design of Mechanical power Transmission components.
- To understand the standard procedure available for Design of Transmission of Mechanical elements
- To learn to use standard data and catalogues

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C309.1	apply the concepts of design to belts, chains and rope drives.	K3
C309.2	apply the concepts of design to spur, helical gears.	K3
C309.3	apply the concepts of design to worm and bevel gears.	K3
C309.4	apply the concepts of design to gear boxes .	K3
C309.5	apply the concepts of design to cams, brakes and clutches	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C309.1	3	3	2	2	-	1	1	1	-	1	-	1	3	1
C309.2	3	3	2	2	-	1	1	1	-	1	-	1	3	1
C309.3	3	3	2	2	-	1	1	1	-	1	-	1	3	1
C309.4	3	3	2	2	-	1	1	1	-	1	-	1	3	1
C309.5	3	3	2	2	-	1	1	1	-	1	-	1	3	1
AVG	3.0	3.0	2.0	2.0		1.0	1.0	1.0		1.0		1.0	3.0	1.0



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COURSE OBJECTIVES

- To provide an overview of how computers are being used in mechanical component design
- To understand the application of computers in various aspects of Manufacturing viz., Design, Proper planning, Manufacturing cost, Layout & Material Handling system.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C310.1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics	K2
C310.2	Explain the fundamentals of parametric curves, surfaces and Solids	K2
C310.3	Summarize the different types of Standard systems used in CAD	K2
C310.4	Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machines	K3
C310.5	Summarize the different types of techniques used in Cellular Manufacturing and FMS	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C310.1	3	2	-	-	1	-	-	-	-	-	-	-	1	1
C310.2	3	2	2	2	1	-	-	-	-	-	-	-	1	1
C310.3	3	2	2	2	1	-	-	-	-	-	-	-	1	1
C310.4	3	2	2	2	-	-	-	-	-	-	-	-	1	1
C310.5	3	2	2	2	-	-	-	-	-	-	-	-	1	1
AVG	3	2	2	2	1								1	1



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COURSE OBJECTIVES

- To understand the mechanisms of heat transfer under steady and transient conditions.
- To understand the concepts of heat transfer through extended surfaces.
- To learn the thermal analysis and sizing of heat exchangers and to understand the basic concepts of mass transfer.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C311.1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems	K3
C311.2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems	K3
C311.3	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	K2
C311.4	Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems	K2
C311.5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C311.1	3	3	1	1	-	-	-	-	-	-	-	-	2	1
C311.2	3	2	1	1	-	-	-	-	-	-	-	-	2	1
C311.3	3	2	2	1	-	-	-	-	-	-	-	-	2	1
C311.4	3	2	1	1	-	-	-	-	-	-	-	-	2	1
C311.5	3	1	1	1	-	-	-	-	-	-	-	-	2	1
AVG	3	2	1.2	1									2	1



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DEPARTMENT OF MECHANICAL ENGINEERING

ME8692 FINITE ELEMENT ANALYSIS

COURSE OBJECTIVES

- To introduce the concepts of Mathematical Modeling of Engineering Problems.
- To appreciate the use of FEM to a range of Engineering Problems.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C312.1	Summarize the basics of finite element formulation.	K2
C312.2	Apply finite element formulations to solve one dimensional Problems.	K3
C312.3	Apply finite element formulations to solve two dimensional scalar Problems.	K3
C312.4	Apply finite element method to solve two dimensional Vector problems.	K3
C312.5	Apply finite element method to solve problems on iso parametric element and dynamic Problems.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C312.1	2	2	-	2	-	1	-	1	1	1	-	-	2	-
C312.2	2	3	-	2	-	1	-	1	1	1	-	-	2	-
C312.3	2	3	-	2	-	1	-	1	1	1	-	-	2	-
C312.4	2	3	-	2	-	1	-	1	1	1	-	-	2	-
C312.5	2	3	-	2	-	1	-	1	1	1	-	-	2	-
AVG	2	2.8		2		1		1	1	1			2	

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COURSE OBJECTIVES

- To provide student with knowledge on the application of fluid power in process, construction and manufacturing Industries.
- To provide students with an understanding of the fluids and components utilized in modern industrial fluid power system.
- To develop a measurable degree of competence in the design, construction and operation of fluid power circuits.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C313.1	Explain the Fluid power and operation of different types of pumps.	K2
C313.2	Summarize the features and functions of Hydraulic motors, actuators and Flow control valves	K3
C313.3	Explain the different types of Hydraulic circuits and systems	K3
C313.4	Explain the working of different pneumatic circuits and systems	K3
C313.5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313.1	3	2	2	-	1	1	2	-	-	-	-	2	3	3
C313.2	3	2	2	-	1	1	1	-	-	-	-	2	3	3
C313.3	3	2	2	2	1	1	2	1	-	-	-	2	3	3
C313.4	3	2	2	2	1	1	2	1	-	-	-	2	3	3
C313.5	3	2	1	2	1	1	2	1	-	-	-	2	3	3
AVG	3.0	2.0	1.8	2.0	1.0	1.0	1.8	1.0				2.0	3.0	3.0



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DEPARTMENT OF MECHANICAL ENGINEERING

ME8091 AUTOMOBILE ENGINEERING

COURSE OBJECTIVES

- To understand the construction and working principle of various parts of an automobile.
- To have the practice for assembling and dismantling of engine parts and transmission system

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C314.1	Recognize the various parts of the automobile and their functions and materials.	K2
C314.2	Discuss the engine auxiliary systems and engine emission control.	K3
C314.3	Distinguish the working of different types of transmission systems.	K3
C314.4	Explain the Steering, Brakes and Suspension Systems.	K3
C314.5	Predict possible alternate sources of energy for IC Engines	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314.1	2	1	-	-	-	-	-	-	-	-	-	-	1	1
C314.2	2	1	-	-	-	-	1	1	-	-	-	-	1	1
C314.3	2	1	-	-	-	-	-	-	-	-	-	-	1	1
C314.4	2	1	-	-	-	-	-	-	-	-	-	-	1	1
C314.5	2	1	-	-	-	-	1	-	-	-	-	-	1	1
AVG	2	1					1	1					1	1



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COURSE OBJECTIVES

- To gain practical experience in handling 2D drafting and 3D modelling software systems.
- To study the features of CNC Machine Tool.
- To expose students to modern control systems (Fanuc, Siemens etc.)
- To know the application of various CNC machines like CNC lathe, CNC Vertical Machining centre, CNC EDM and CNC wire-cut and studying of Rapid prototyping.

COURSE OUTCOMES

ME8681 CAD / CAM LABORATORY		
On successful completion of this course, the student will be able to		
		RBT
C315.1	Draw 3D and Assembly drawing using CAD software	K6
C315.2	Demonstrate manual part programming with G and M codes using CAM	K4
C315.3	Apply the Part programming to create intricate shapes.	K4

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315.1	2	2	3	3	-	-	-	-	-	-	-	-	3	1
C315.2	2	3	3	2	2	-	-	-	-	-	-	-	3	2
C315.3	-	2	3	2	-	-	-	-	-	-	-	-	3	1
AVG	2.0	2.3	3.0	2.3	2.0								3.0	1.3



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COURSE OBJECTIVES

- The main objective is to give an opportunity to the student to get hands on training in the fabrication of one or more components of a complete working model, which is designed by them.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C316.1	Design the machine element or the mechanical product.	K6
C316.2	Fabricate the machine element or the mechanical product.	K4
C316.3	Demonstrate the working model of the machine element or the mechanical product.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C316.1	3	3	3	1	1	2	2	2	2	3	3	3	2	2
C316.2	3	3	3	1	1	2	2	2	2	3	3	3	2	2
C316.3	3	3	3	1	1	2	2	2	2	3	3	3	2	2
AVG	3	3	3	1	1	2	2	2	2	3	3	3	2	2

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COURSE OBJECTIVES

- Enhance the Employability and Career Skills of students
- Orient the students towards grooming as a professional
- Make them Employable Graduates
- Develop their confidence and help them attend interviews successfully.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C317.1	• Make effective presentations	K4
C317.2	• Participate confidently in Group Discussions.	K3
C317.3	• Attend job interviews and be successful in them.	K2
C317.4	• Develop adequate Soft Skills required for the workplace	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C317.1	-	-	-	-	-	-	-		2	2	-	3	-	-
C317.2	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C317.3	-	-	-	-	-	-	-		3	3	-	3	-	-
AVG								2.0	2.7	2.7		3.0		



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COURSE OBJECTIVES

- ♦ Providing an overview of Power Plants and detailing the role of Mechanical Engineers in their operation and maintenance.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C401.1	Explain the layout, construction and working of the components inside a thermal power plant.	K2
C401.2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.	K2
C401.3	Explain the layout, construction and working of the components inside nuclear power plants.	K2
C401.4	Explain the layout, construction and working of the components inside Renewable energy power plants.	K2
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.	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401.1	2	-	3	-	-	1	1	1	-	-	-	-	1	1
C401.2	2	-	3	-	-	1	1	1	-	-	-	-	1	1
C401.3	2	-	3	-	1	1	1	1	-	-	-	-	1	1
C401.4	2	2	1	1	1	1	2	1	-	-	-	-	1	1
C401.5	3	1	3	-	1	2	3	1	-	-	-	1	1	2
AVG	2.2	1.5	2.6	1.0	1.0	1.2	1.6	1.0				1.0	1.0	1.2

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COURSE OBJECTIVES

- To introduce the process planning concepts to make cost estimation for various products after process planning

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C402.1	select the process, equipment and tools for various industrial products.	K3
C402.2	prepare process planning activity chart.	K3
C402.3	explain the concept of cost estimation.	K2
C402.4	compute the job order cost for different type of shop floor.	K3
C402.5	calculate the machining time for various machining operations.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C402.1	2	2		2	-	1	-	-	-	1	-	-	2	1
C402.2	1	2	2	1	-	-	2	-	1	-	-	2	3	2
C402.3	2	2	2	-	-	-	-	-	-	-	-	-	3	2
C402.4	2	-	2	2	-	-	-	-	-	-	-	-	3	1
C402.5	2	-	2	2	-	-	-	-	-	-	2	2	3	2
AVG	1.8	2.0	2.0	1.8		1.0	2.0		1.0	1.0	2.0	2.0	2.8	1.6



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COURSE OBJECTIVES

- To impart knowledge about the elements and techniques involved in Mechatronics systems which are very much essential to understand the emerging field of automation.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C403.1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.	K2
C403.2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.	K2
C403.3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing	K2
C403.4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.	K2
C403.5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C403.1	2	2	2	1	1	1	-	1	-	-	-	1	3	1
C403.2	2	2	2	2	2	1	-	1	-	-	-	1	3	3
C403.3	2	2	2	2	2	1	-	1	1	-	-	1	3	3
C403.4	2	2	2	2	2	1	-	1	-	-	-	1	3	3
C403.5	2	2	2	1	2	1	-	1	-	1	2	1	3	2
AVG	2.0	2.0	2.0	1.6	1.8	1.0		1.0	1.0	1.0	2.0	1.0	3.0	2.4

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COURSE OBJECTIVES

To gain insights about the importance of lean manufacturing and six sigma practices.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C404.1	Understand the fundamentals of Lean and Six sigma.	K2
C404.2	Understand the tools and techniques used in analysis.	K2
C404.3	Understand the six sigma methodologies.	K2
C404.4	Understand the implementation and challenges in six sigma.	K2
C404.5	Understand the evaluation and continuous improvement methods.	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	1	2	-	-	-	1	-	-	-	-	-	1	1	1
C404.2	1	2	2	2	2	-	-	-	-	-	-	-	2	1
C404.3	1	2	1	1	-	1	-	2	1	1	-	-	1	1
C404.4	1	1	1	-	-	-	-	2	-	-	3	-	1	1
C404.5	-	-	-	-	-	-	-	-	-	-	-	1	-	1
AVG	1.0	1.8	1.3	1.5	2.0	1.0		2.0	1.0	1.0	3.0	1.0	1.3	1.0



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COURSE OBJECTIVES

- To learn about various unconventional machining processes, the various process parameters and their influence on performance and their applications

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C405.1	Explain the need for unconventional machining processes and its classification	K2
C405.2	Compare various thermal energy and electrical energy based unconventional machining processes.	K2
C405.3	Summarize various chemical and electro-chemical energy based unconventional machining processes.	K2
C405.4	Explain various nano abrasives based unconventional machining processes.	K2
C405.5	Distinguish various recent trends based unconventional machining processes.	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C405.1	2	1	1	-	-	-	2	-	-	-	-	-	1	1
C405.2	2	1	-	-	-	-	2	-	-	-	-	-	1	2
C405.3	2	1	-	-	-	-	2	-	-	-	-	-	1	2
C405.4	2	1	-	-	-	-	2	-	-	-	-	-	1	2
C405.5	1	2	-	-	-	-	2	1	-	-	-	-	1	2
AVG	1.8	1.2	1				2	1					1	1.8



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COURSE OBJECTIVES

- To understand the functions of the basic components of a Robot.
- To study the use of various types of End of Effectors and Sensors
- To impart knowledge in Robot Kinematics and Programming
- To learn Robot safety issues and economics.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C406.1	Explain the concepts of industrial robots, classification, specifications and coordinate systems. Also summarize the need and application of robots in different sectors.	K2
C406.2	Illustrate the different types of robot drive systems as well as robot end effectors.	K2
C406.3	Apply the different sensors and image processing techniques in robotics to improve the ability of robots.	K3
C406.4	Develop robotic programs for different tasks and familiarize with the kinematics motions of robot.	K4
C406.5	Examine the implementation of robots in various industrial sectors and interpolate the economic analysis of robots.	K5

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C406.1	2	1	-	-	-	-	-	1	-	-	-	-	1	2
C406.2	2	-	-	-	-	-	-	-	-	-	-	-	1	1
C406.3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C406.4	2	1	1	-	-	-	-	-	-	-	-	-	-	-
C406.5	2	1	-	-	-	-	-	-	-	-	-	-	1	-
AVG	2.0	1.0	1.0					1.0					1.0	1.5



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COURSE OBJECTIVES

- To give exposure to software tools needed to analyze engineering problems.
- To expose the students to different applications of simulation and analysis tools.

COURSE OUTCOMES

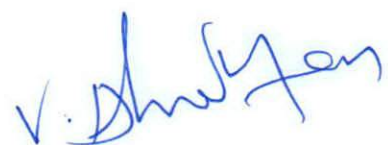
On successful completion of this course, the student will be able to		RBT
C407.1	Simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB.	K4
C407.2	Analyze the stresses and strains induced in plates, brackets and beams and heat transfer problems.	K4
C407.3	Calculate the natural frequency and mode shape analysis of 2D components and beams.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C407.1	3	2	2	1	-	-	-	-	-	1	-	-	3	1
C407.2	2	2	1	2	2	2	1	-	1	-	-	-	3	2
C407.3	2	3	3	2	-	-	-	-	-	-	1	-	3	1
AVG	2.3	2.3	2.0	1.7	2.0	2.0	1.0	-	1.0	1.0	1.0	-	3.0	1.3



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COURSE OBJECTIVES

- To know the method of programming the microprocessor and also the design, modeling & analysis of basic electrical, hydraulic & pneumatic Systems which enable the students to understand the concept of mechatronics.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C408.1	Demonstrate the functioning of mechatronics system with pneumatic and hydraulic.	K3
C408.2	Demonstrate the functioning of mechatronics system with electrical systems.	K3
C408.3	Demonstrate the functioning of control systems with the help of PLC and microcontrollers.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C408.1	3	2	-	-	1	-	-	-	1	-	-	2	3	2
C408.2	3	2	-	-	2	2	-	-	-	-	-	-	3	2
C408.3	3	2	3	-	2	-	-	-	-	1	-	2	3	2
AVG	3.0	2.0	3.0		1.7	2.0			1.0	1.0			3.0	2.0

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DEPARTMENT OF MECHANICAL ENGINEERING

ME8712 TECHNICAL SEMINAR

COURSE OBJECTIVES

To enrich the communication skills of the student and presentations of technical topics of interest, this course is introduced. In this course, a student has to present three Technical papers or recent advances in engineering/technology that will be evaluated by a Committee constituted by the Head of the Department.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C409.1	Understands the various forms communication skills.	K2
C409.2	Develops the presentation of technical papers or recent advances in the context.	K3
C409.3	Apply the concepts learned from different journals and presentation.	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C409.1	2	2	-	1	2		1	2		3	-	3	1	2
C409.2	2	1	-	1		2	2	1	3	2	-		1	2
C409.3	1	-	-	-	2	2	2	1		2	-	1	1	2
AVG	1.7	1.5		1.0	2.0	2.0	1.7	1.3	3.0	2.3		2.0	1.0	2.0



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Kundrathur, Chennai - 600 069.

COURSE OBJECTIVES

- To enable the students to study the evolution of Management, to study the functions and principles of management and to learn the application of the principles in an organization

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C410.1	Understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management	K2
C410.2	Understanding of Planning	K2
C410.3	Understanding of Organizing	K2
C410.4	Understanding of Directing	K2
C410.5	Understanding of Controlling	K2

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C410.1	-	-	-	-	-	1	1	-	3	-	-	1	-	1
C410.2	-	-	-	-	-	-	-	-	-	-	-	1	-	1
C410.3	-	-	-	-	-	-	-	-	-	-	-	1	-	1
C410.4	-	-	-	-	-	-	-	-	-	-	3	1	-	1
C410.5	-	-	-	-	1	-	-	-	3	1	3	1	-	1
AVG					1	1	1		3	1	3	1		1



Regulation 2017

V. Dhinakaran

Approved By

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COURSE OBJECTIVES

To develop and strengthen entrepreneurial quality and motivation in students and to impart basic entrepreneurial skills and understanding to run a business efficiently and effectively.

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C411.1	Expound the types of Entrepreneurships and economic Growth	K2
C411.2	Importance of motivation and training on the Entrepreneurship Development	K2
C411.3	Selecting a Good Business opportunity and marker survey research	K3
C411.4	Explain the term Loan, importance of taxation	K2
C411.5	Formulate the business Incubators – Government Policy for Small Scale Enterprises	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C411.1	-	-	-	-	-	1	2	2	3	2	2	3	-	1
C411.2	-	-	-	-	-	1	2	2	3	2	1	3	-	-
C411.3	-	-	-	-	-	1	2	3	3	2	3	3	1	2
C411.4	-	-	-	-	-	1	2	3	3	2	3	3	-	-
C411.5	-	-	-	-	-	1	2	2	3	2	2	3	-	1
AVG						1.0	2.0	2.4	3.0	2.0	2.2	3.0	1.0	1.3



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COURSE OBJECTIVES

To develop knowledge to formulate a real world problem and project's goals
To identify the various tasks of the project to determine standard procedures.
To identify and learn new tools, algorithms and techniques.
To understand the various procedures for validation of the product and analysis the cost effectiveness.
To understand the guideline to Prepare report for oral demonstrations

COURSE OUTCOMES

On successful completion of this course, the student will be able to		RBT
C412.1	Design/ Develop for a challenging practical problems to find solution.	K6
C412.2	Formulating proper methodology to derive the solution as a team with confined time duration.	K5
C412.3	Demonstrate the project work both in oral and written format	K3

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C412.1	3	3	3	1	1	2	2	2	2	3	3	3	2	2
C412.2	3	3	3	1	1	2	2	2	2	3	3	3	2	2
C412.3	3	3	3	1	1	2	2	2	2	3	3	3	2	2
AVG	3.0	3.0	3.0	1.0	1.0	1.8	2.0	2.1	2.3	2.8	2.8	3.0	1.8	1.8



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