



DEPARTMENT OF MECHANICAL ENGINEERING		
SUBJECTS FOR B.Tech (MINOR) in MECHANICAL ENGINEERING (R20)		
S.No	COURSE CODE:	COURSE NAME: BASIC THERMODYNAMICS
1	CO1: Basic concepts like thermodynamic system, its boundary, related fundamental definitions and distinguish between point function and path function.	
	CO2: Energy conservation principle, concept of equality of temperature, principle of operation of various temperature measuring devices and applications of various flow systems.	
	CO3: Thermodynamics principles to heat engines & refrigerator/ heat pump and analyse the concepts of Carnot cycle, entropy, availability and irreversibility, Maxwells relations and thermodynamic functions.	
	CO4: Process of steam formation and its representation on property diagrams with various phase changes and should be able to calculate the quality of steam after its expansion in a steam turbine, with the help of standard steam tables and charts.	
	CO5: To calculate various psychrometric properties of air using psychrometric charts.	
	COURSE CODE:	COURSE NAME: MANUFACTURING PROCESSES
2	CO1: Learn about the basic concepts of casting	
	CO2: Design the gating system for different metallic components	
	CO3: Understand the working principles of arc and gas welding processes.	
	CO4: Understand principles of Forging, rolling, extrusion and drawing processes.	
	CO5: Illustrate the various sheet metal forming processes for a specific application.	
	COURSE CODE:	COURSE NAME: MATERIALS SCIENCE AND ENGINEERING
3	CO1: To learn the structure of metals and the necessity of alloying.	
	CO2: To learn the equilibrium diagrams and properties of alloys.	
	CO3: To learn about the ferrous alloys.	
	CO4: To learn the structure and properties of non-ferrous metals and alloys.	
	CO5: To learn the principles of heat treatment of alloys.	
	COURSE CODE:	COURSE NAME: BASIC MECHANICAL DESIGN
4	CO1: Learn the design procedure of engineering problems with constraints.	
	CO2: Measure the stress concentration and strength of machine elements	
	CO3: Learn the principles and apply to design the riveted and welded joints.	
	CO4: Learn the design principles to design shafts and shaft couplings under different loading conditions.	
	CO5: Know about mechanical springs and apply the principles to design springs for different loading conditions.	
	COURSE CODE:	COURSE NAME: OPTIMIZATION TECHNIQUES
5	CO1: Learn the classification of optimization problems and classical optimization techniques.	
	CO2: Learn and apply unconstrained optimization techniques to solve problems.	
	CO3: Learn and apply constrained optimization techniques to solve problems.	

		CO4: Learn to obtain optimized solutions using constrained and unconstrained geometric programming.
		CO5: Learn the principles of dynamic programming and its applications.
	COURSE CODE:	COURSE NAME: POWER PLANT ENGINEERING
6		CO1: Illustrate the functions of different components of steam power plant
		CO2: Describe basic working principles, performance characteristics and components of gas turbine and diesel power plants
		CO3: Illustrate basic working principles of hydroelectric power plants and analyze the importance of hydrological cycles, measurements and drainage characteristics
		CO4: Learn about the principal components and types of nuclear reactors
		CO5: Analyze the working of power plant instrumentation and estimate the economics of power plants
	COURSE CODE:	COURSE NAME: AUTOMOBILE ENGINEERING
7		CO1: Acquire the basic knowledge of anatomy of an automobile and realize the functions of various steering systems.
		CO2: Understand the systems of automobile transmission systems
		CO3: Understand various braking and suspension systems used in automobiles
		CO4: Acquire the knowledge of engine specifications and safety systems and its components
		CO5: Explain the systems of engine servicing and emission control systems
	COURSE CODE:	COURSE NAME: INDUSTRIAL ENGINEERING AND MANAGEMENT
8		CO1: Learn the scientific principles of management to improve productivity.
		CO2: Gain the knowledge of financial management.
		CO3: Learn the types of plant layout and principles of statistical quality control.
		CO4: Apply the concepts of human resources management.
		CO5: Analyze project related issues and solve through project management techniques.
	COURSE CODE:	COURSE NAME: PRODUCTION DESIGN AND DEVELOPMENT
9		CO1: Understand the basic concepts of product design process
		CO2: Identify the operations of product management and impact of manufacturing processes on product decisions
		CO3: Understand concepts of risks and reliability of the products design
		CO4: Interpret the various testing procedure of the product design.
		CO5: Illustrate the concepts of maintenance concepts and procedures of product design
	COURSE CODE:	COURSE NAME: SMART MANUFACTURING
10		CO1: Apply the basic concepts of smart manufacturing.
		CO2: Analyze about smart machines and sensors.
		CO3: Utilize the principles of IoT connectivity to industry 4.0.
		CO4: Perceive about digital twin and its applications and machine learning and artificial intelligence in manufacturing.
		CO5: Learn the basic concepts of metaverse.

		COURSE CODE:	COURSE NAME: MECHANICAL MEASUREMENTS
11	CO 1: Learn the principles of measurement systems and measurement of displacement.		
	CO 2: Learn the measurement concepts of temperature and pressure.		
	CO 3: Apply the concepts of measurement of level and the measurement of flow and speed.		
	CO 4: Learn the concepts of measurement of stress and strain.		
	CO 5: Apply the concepts in measuring the humidity, force, torque and power.		
		COURSE CODE:	COURSE NAME: INDUSTRIAL ROBOTICS
12	CO 1: Discuss various applications and components of industrial robot systems		
	CO 2: Learn about the types of actuators used in robotics		
	CO 3: Calculate the forward kinematics and inverse kinematics.		
	CO 4: Learn about programming principles and languages for a robot control system		
	CO 5: Discuss the applications of image processing and machine vision in robotics.		
		COURSE CODE:	COURSE NAME: MECHATRONICS
13	CO 1: Understand the use the various mechatronics systems, measurement systems, sensors and transducers.		
	CO 2: Apply the concepts of solid state electronic devices.		
	CO 3: Identify the components in the design of electro mechanical systems.		
	CO 4: Apply the concepts of digital electronics and applications of PLCs for control.		
	CO 5: Understand system interfacing, data acquisition and design of mechatronics systems.		

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PRINCIPAL