

Lesson Plan for MECHATRONICS (TH.5) , 5th Semester, Mechanical Engg. (WINTER-2025)

Discipline: Mechanical Engg		Semester: 5th	Name of the Teaching Faculty: Sri B.K.Dash, Senior Lecturer, Mechanical
Subject: MECHATRONICS (TH.5)		No. of Days/ week class allotted: 4	Semester Starts from 14.07.2025
WEEK	PERIOD	TOPICS TO BE COVERED	
01	01	1.0 INTRODUCTION TO MECHATRONICS 1.1 Definition of Mechatronics 1.2 Advantages & disadvantages of Mechatronics 1.3 Application of Mechatronics	
	02	1.4 Scope of Mechatronics in Industrial Sector 1.5 Components of a Mechatronics System 1.6 Importance of mechatronics in automation	
	03	2.0 SENSORS AND TRANSDUCERS 2.1 Definition of Transducers 2.2 Classification of Transducers	
	04	2.3 Electromechanical Transducers Resistance transducer, Variable inductance transducer,	
02	01	Capacitive transducer, Piezo electric transducer	
	02	Hall effect transducer, Photo electric transducer	
	03	Strain Gauges, Load cells	
	04	Proximity sensors	
03	01	Measurement of Displacement and measurement of velocity	
	02	Measurement of acceleration	
	03	Measurement of force	
	04	2.7 Temperature and light sensors.	
04	01	3.0 ACTUATORS-MECHANICAL, ELECTRICAL 3.1 Mechanical Actuators, 3.1.1 Machine, Kinematic Link, Kinematic Pair 3.1.2 Mechanism, Slider crank Mechanism	
	02	3.1.3 Gear Drive, Spur gear, Bevel gear, Helical gear, worm gear	
	03	3.1.4 Belt & Belt drive 3.1.5 Bearings	
	04	3.2 Electrical Actuator 3.2.1 Switches and relay 3.2.2 Solenoid	
05	01	3.2.3 D.C Motors	
	02	3.2.4 A.C Motor(Single phase induction motor)	
	03	3.2.4 A.C Motor(Three phase induction motor)	
	04	3.2.5 Stepper Motors 3.2.6 Specification and control of stepper motors	
06	01	3.2.7 Servo Motors D.C & A.C	
	02	Hydraulic actuators	
	03	Pneumatic actuators	
	04	Doubt clear class	
07	01	4.0 PROGRAMMABLE LOGIC CONTROLLERS(PLC) 4.1 Introduction 4.2 Advantages of PLC 4.3 Selection and uses of PLC	
	02	4.4 Architecture basic internal structures Function of various blocks that makes PLC	
	03	Working Principle of PLC, Memory types	
	04	Concepts of input and outputs a. Concepts of digital inputs and outputs b. Concepts of analog inputs and outputs	
08	01	Concept of PLC scan cycle	
	02	Different programming language of PLC	

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		a. Programming methods b. Programming Devices
	03	Basic introduction of NO/NC contacts
	04	Ladder Logic
09	01	Concept of latching and unlatching
	02	Timers and counters
	03	4.5 Input/output Processing and Programming
	04	4.6 Mnemonics
10	01	4.7 Master and Jump Controllers
	02	Practice of simple ladder diagram programming
	03	Doubt clear class
	04	Class test(Objectives on CH-1,CH-2,CH-3)
11	01	5.0 ELEMENTS OF CNC MACHINES 5.1 Introduction to Numerical Control of machines and CAD/CAM 5.1.1 NC machines 5.1.2 CNC machines
	02	5.1.3.CAD/CAM 5.1.3.1 CAD 5.1.3.2 CAM
	03	5.1.3.3 Software and hardware for CAD/CAM
	04	5.1.3.3 Software and hardware for CAD/CAM
12	01	5.1.3.4 Functioning of CAD/CAM system
	02	5.1.3.4 Features and characteristics of CAD/CAM system 5.1.3.5 Application areas for CAD/CAM
	03	5.2 ELEMENTS OF CNC MACHINES 5.2.1 Introduction 5.2.2 Machine Structure
	04	5.2.3 Guideways/Slide ways 5.2.3.1 Introduction and Types of Guideways
13	01	5.2.3.2 Factors of design of guideways
	02	5.2.4 Drives 5.2.4.1 Spindle drives 5.2.4.2 Feed drive
	03	5.2.5 Spindle and Spindle Bearings
	04	Doubt clear class
14	01	6.0 ROBOTICS 6.1 Definition, Function and laws of robotics
	02	6.2Types of industrial robots
	04	6.3 Robotic systems
	05	6.4 Advantages and Disadvantages of robots
15	01	Doubt clear class
	02	Online test of CH-1,CH-2,CH-03
	03	Online test of CH-4,CH-5,CH-06

Sri Bipin Kumar Dash
Concerned faculty

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11/07/2025
HOD

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