Lesson Plan for Mechatronics, 5th Sem. Mechanical Engg. (2020-2021)

Discipline: Mechanical Engg	**Semester:** 5th	**Name of the Teaching Faculty:** TRUPTI MOHANTY
Subject: mechatronics	No. of Days/ week class allotted	**Semester From date:** 15.09.2022 To Date: 22.12.2022 No. of Weeks:

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** 2.1Defination 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** 3.1Mechanical 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 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

Trupti Mohanty
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