

UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA		
Discipline: Mechanical	Semester: 5TH	Name of the Teaching faculty: MONALISHA SWAIN
Subject: Mechatronics (Th-4)	No of Days/ Week class alloted: 4	Semester from Date: 01.08. 2023 To Date: 11.12.2023 No of weeks: 15
Week	Class	Topics
1 st	1 st	Introduction
	2 nd	1.1 Definition of Mechatronics 1.2 Advantages & disadvantages of Mechatronics
	3 rd	1.3 Application of Mechatronics 1.4 Scope of Mechatronics in Industrial Sector
	4 th	1.5 Components of a Mechatronics System
2 nd	1 st	1.6 Importance of mechatronics in automation
	2 nd	4.0 PROGRAMMABLE LOGIC CONTROLLERS(PLC) 4.1 Introduction 4.2 Advantages of PLC 4.3 Selection and uses of PLC
	3 rd	4.4 Architecture basic internal structures
	4 th	4.5 Input/output Processing and Programming
3 rd	1 st	4.6 Mnemonics 4.7 Master and Jump Controllers
	2 nd	5.0 ELEMENTS OF CNC MACHINES 5.1 Introduction to Numerical Control of machines and CAD/CAM
	3 rd	5.1.1 NC machines, Position control in NC machine
	4 th	5.1.2 CNC machines
4 th	1 st	5.1.3.CAD/CAM 5.1.3.1 CAD
	2 nd	5.1.3.1 CAM, CIM
	3 rd	5.1.3.3 Hardware of CAD/CAM
	4 th	5.1.3.3 Hardware of CAD/CAM
5 th	1 st	5.1.3.3 Software of CAD/CAM
	2 nd	5.1.3.4 Functioning of CAD/CAM system
	3 rd	5.1.3.4 Features and characteristics of CAD/CAM system
	4 th	5.1.3.5 Application areas for CAD/CAM
6 th	1 st	5.2 elements of CNC machines 5.2.1 Introduction 5.2.2 Machine Structure
	2 nd	5.2.3 Guideways/Slide ways 5.2.3.1 Introduction
	3 rd	Types of Guideways
	4 th	5.2.3.2 Factors of design of guideways
7 th	1 st	5.2.4 Drives 5.2.4.1 Spindle drives
	2 nd	5.2.4.2 Feed drives
	3 rd	5.2.5 Spindle and Spindle Bearings

	4 th	Types of Spindle bearings
8 th	1 st	6.0 ROBOTICS 6.1 Definition, Function and laws of robotics 6.2 Types of Industrial Robots 6.4 Advantages and disadvantages of robots
	2 nd	6.3 Robotic systems
	3 rd	2.0 SENSORS AND TRANSDUCERS 2.1 Defination of Transducers 2.2 Classification of Transducers
	4 th	2.3 Electromechanical Transducers 2.4 Transducers Actuating Mechanisms
9 th	1 st	2.5 Displacement & Positions Sensors 2.5.1 Potentiometer 2.5.2 Strain Gauge
	2 nd	2.5.3 Hall Effect transducer 2.5.4 LVDT 2.5.5 Digital transducer
	3 rd	2.5.4 Angular displacement transducer
	4 th	Velocity sensor
10 th	1 st	Force sensor
	2 nd	Motion sensor
	3 rd	Pressure sensor
	4 th	Temperature sensor
11 th	1 st	Temperature sensor
	2 nd	Light sensor
	3 rd	3.0 ACTUATORS-MECHANICAL, ELECTRICAL 3.1 Mechanical Actuators 3.1.1 Machine, Kinematic Link, Kinematic Pair
	4 th	3.1.2 Mechanism, Slider crank Mechanism
12 th	1 st	3.1.3 Gear Drive, Spur gear, Bevel gear, Helical gear, worm gear
	2 nd	Problem on Gear train
	3 rd	3.1.4 Belt & Belt drive
	4 th	Problems on Power transmission
13 th	1 st	3.1.5 Bearings
	2 nd	3.2 Electrical Actuator
	3 rd	3.2.3 D.C Motors
	4 th	3.2.3 D.C Motors
14 th	1 st	3.2.5 Stepper Motors
	2 nd	3.2.6 Specification and control of stepper motors
	3 rd	3.2.1 Switch
	4 th	3.2.2 Relays and Solenoid
15 th	1 st	3.2.4 AC motors
	2 nd	3.2.4 AC motors
	3 rd	Revision
	4 th	Revision

