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: 14.07. 2025 To Date:15 .11.2025 No of weeks: 15**
Week	Class	Topics
1st	1st	Introduction
	2nd	1.1 Definition of Mechatronics 1.2 Advantages & disadvantages of Mechatronics
	3rd	1.3 Application of Mechatronics 1.4 Scope of Mechatronics in Industrial Sector
	4th	1.5 Components of a Mechatronics System
2nd	1st	1.6 Importance of mechatronics in automation
	2nd	**4.0 PROGRAMMABLE LOGIC CONTROLLERS(PLC)** 4.1 Introduction 4.2 Advantages of PLC 4.3 Selection and uses of PLC
	3rd	4.4 Architecture basic internal structures
	4th	4.5 Input/output Processing and Programming
3rd	1st	4.6 Mnemonics 4.7 Master and Jump Controllers
	2nd	**5.0 ELEMENTS OF CNC MACHINES** 5.1 Introduction to Numerical Control of machines and CAD/CAM
	3rd	5.1.1 NC machines, Position control in NC machine
	4th	5.1.2 CNC machines
4th	1st	5.1.3.CAD/CAM 5.1.3.1 CAD
	2nd	5.1.3.1 CAM, CIM
	3rd	5.1.3.3 Hardware of CAD/CAM
	4th	5.1.3.3 Hardware of CAD/CAM
5th	1st	5.1.3.3 Software of CAD/CAM
	2nd	5.1.3.4 Functioning of CAD/CAM system
	3rd	5.1.3.4 Features and characteristics of CAD/CAM system
	4th	5.1.3.5 Application areas for CAD/CAM
6th	1st	5.2 elements of CNC machines 5.2.1 Introduction 5.2.2 Machine Structure
	2nd	5.2.3 Guideways/Slide ways 5.2.3.1 Introduction
	3rd	Types of Guideways
	4th	5.2.3.2 Factors of design of guideways
7th	1st	5.2.4 Drives 5.2.4.1 Spindle drives
	2nd	5.2.4.2 Feed drives
	3rd	5.2.5 Spindle and Spindle Bearings

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

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