GOVERNMENT POLYTECHNIC, KORAPUT

DEPARTMENT OF MECHANICAL ENGINEERING

Discipline: **MECHANICAL ENGG**	Semester: **5TH**	Name of the Teaching Faculty: M. KRISHNA SAGAR
Subject: **MECHATRONICS**	No. of days/per week class allotted: 04	Semester From date: 21/9/20 To Date: 19/2/21 No. of Weeks: 15

COURSE OUTCOMES

1. To study the definition and elements of mechatronics system.
2. To learn how to apply the principle of mechatronics for the development of productive systems.
3. To learn the CNC technology and applications of mechatronics in manufacturing automation.
4. Define different type of system and Sensors and solve the simple problems.
5. Explain the concept of Mechanical actuation, Electrical actuation and solve the simple problems.
6. Find out the various types of System Models & Input /Output parts and solve the problems.
7. Describe the programmable Logic Controller and develop programme in PLC.
8. To learn the Industrial robotics

WEEK	CLASS DAY	THEORY TOPIC
1ST	1	**1. INTRODUCTION TO MECHATRONICS** Definition of Mechatronics
	2	Advantages & disadvantages of Mechatronics Application of Mechatronics
	3	Scope of Mechatronics in Industrial Sector
	4	Components of a Mechatronics System
2ND	1	Importance of Mechatronics in automation
	2	**2. SENSORS AND TRANSDUCERS** Definition of Transducers
	3	Classification of Transducers
	4	Electromechanical Transducers
3RD	1	Transducers Actuating Mechanisms
	2	Transducers Actuating Mechanisms
	3	Displacement &Positions Sensors
	4	Displacement &Positions Sensors
4TH	1	Velocity, motion, force and pressure sensors
	2	Velocity, motion, force and pressure sensors
	3	Temperature and light sensors.
	4	**3. ACTUATORS-MECHANICAL, ELECTRICAL** Mechanical Actuators Machine, Kinematic Link, Kinematic Pair
5TH	1	Mechanism, Slider crank Mechanism
	2	Gear Drive, Spur gear, Bevel gear, Helical gear, worm gear
	3	Belt & Belt drive Bearings
	4	Electrical Actuator Switches and relay
6TH	1	Switches and relay Solenoid
	2	D.C Motors A.C Motors

	3	Stepper Motors
7TH	4	Specification and control of stepper motors
	1	Servo Motors D.C & A.C
	2	**4. PROGRAMMABLE LOGIC CONTROLLERS(PLC)** Introduction
	3	PLC Definition
8TH	4	Advantages of PLC
	1	Selection and uses of PLC
	2	Selection and uses of PLC
	3	Architecture basic internal structures
	4	Architecture basic internal structures
9TH	1	Input/output Processing and Programming
	2	Input/output Processing and Programming
	3	Mnemonics
	4	Mnemonics
10TH	1	Master and Jump Controllers
	2	Master and Jump Controllers
	3	**5. ELEMENTS OF CNC MACHINES**
	4	Introduction to Numerical Control of machines and CAD/CAM
11TH	1	NC machines CNC machines
	2	CAD
	3	CAM
	4	Software and hardware for CAD/CAM
12TH	1	Functioning of CAD/CAM system
	2	Features and characteristics of CAD/CAM system
	3	Application areas for CAD/CAM
	4	Introduction of elements of CNC machines
13TH	1	Machine Structure
	2	Guide ways /Slide ways
	3	Introduction and Types of Guide ways
	4	Factors of design of guide ways
14TH	1	Drives Spindle drives
	2	Spindle drives Feed drive
	3	Spindle and Spindle Bearings
	4	**6. ROBOTICS** Definition, Function and laws of robotics
15TH	1	Types of industrial robots
	2	Robotic systems
	3	Advantages and Disadvantages of robots
	4	**REVISION**

ARNING RESOURCES:

01. A textbook of Machine design by RS Khurmi and JK Gupta, S.Chand Publisher
02. Design of Machine elements by V.B. Bhandari, TMH
03. A textbook of Machine design by P.C. Sharma & D.K. Agarwal, S.K. Kataria & Sons
04. Design Data Handbook by S Md. Jalaludeen , Anuradha Publication

Sign. Of Faculty concerned

Sign. Of HOD I/C

Principal, GP Koraput