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| JIHARSUGUDA ENGINEERING SCHOOL,JIHARSUGUDA       |                                     |
| MECHANICAL ENGG. DEPARTMENT                      |                                     |
| Name of the Faculty:<br>PUJA CHANDR<br>ALOK RANA | Session: 2022-23                    |
| Course code.: Th 4                               | Course Name:MECHATRONICS            |
| Programme: Diploma                               | Department: Mechanical Engg. Deptt. |
| Semester: 5TH                                    | Section: M1,M2                      |
| Branch: MECHANICAL ENGG                          |                                     |

| Week | Period | Unit   | Hours | Topic to be Covered   |
|------|--------|--|-------|---|
| 1    | 1      | 1  | 5     | 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                                     |
|      | 5      |  |       | Importance of mechatronics in automation                                |
| 2    | 6      | 2  | 10    | SENSORS AND TRANSDUCERS: Definition of Transducers                      |
|      | 7      |  |       | Classification of Transducers   |
|      | 8      |  |       | Electromechanical Transducers   |
| 3    | 9      |  |       | Transducers Actuating Mechanisms  |
|      | 10     |  |       | Displacement  |
|      | 11     |  |       | Positions Sensors   |
|      | 12     |  |       | Velocity, motion  |
| 4    | 13     |  |       | force and pressure sensors.   |
|      | 14     |  |       | Temperature   |
|      | 15     |  |       | light sensors   |
|      | 16     | ACTUATORS MECHANICAL, ELECTRICAL: Mechanical Actuators |       |   |
|      | 17     | Machine, Kinematic Link, Kinematic Pair                |       |   |

|    |   |   |   |  |    |                                     |
|----|---|---|---|--|----|-------------------------------------|
| 5  | 18  | 3                                       | 10  | Mechanism, Slider crank Mechanism                          |    |                                     |
|    | 19  |   |   | Gear Drive, Spur gear, Bevel gear, Helical gear, worm gear |    |                                     |
| 20 | Belt & Belt drive   |   |   |  |    |                                     |
| 21 | Bearings  |   |   |  |    |                                     |
| 22 | Electrical Actuator: Switches and relay                     |   |   |  |    |                                     |
| 23 | Solenoid, D.C Motors, A.C Motors                            |   |   |  |    |                                     |
| 24 | Stepper Motors, Specification and control of stepper motors |   |   |  |    |                                     |
| 25 | Servo Motors D.C & A.C                                      |   |   |  |    |                                     |
| 6  | 26  |   |   | 4  | 15 | PROGRAMMABLE LOGIC CONTROLLERS(PLC) |
|    | 27  |   |   |  |    | Introduction                        |
|    | 28  | Advantages of PLC                       |   |  |    |                                     |
| 29 | Selection and uses of PLC                                   |   |   |  |    |                                     |
| 7  | 30  | Architecture basic internal structures  |   |  |    |                                     |
|    | 31  | Architecture basic internal structures  |   |  |    |                                     |
|    | 32  | Architecture basic internal structures  |   |  |    |                                     |
|    | 33  | Architecture basic internal structures  |   |  |    |                                     |
| 8  | 34  | Input/output Processing and Programming |   |  |    |                                     |
|    | 35  | Input/output Processing and Programming |   |  |    |                                     |
|    | 36  | Input/output Processing and Programming |   |  |    |                                     |
|    | 37  | Input/output Processing and Programming |   |  |    |                                     |
| 9  | 38  | Mnemonics                               |   |  |    |                                     |
|    | 39  | Master and Jump Controllers             |   |  |    |                                     |
|    | 40  | Master and Jump Controllers             |   |  |    |                                     |
|    | 10  | 41                                      | ELEMENTS OF CNC MACHINES: 1 Introduction to Numerical Control of machines and CAD/CAM |  |    |                                     |
| 42 |   | NC machines, CNC machines               |   |  |    |                                     |
| 43 |   | CAD/CAM                                 |   |  |    |                                     |
| 44 |   | Software and hardware for CAD/CAM       |   |  |    |                                     |
| 11 |   |   |   |  |    |                                     |

|    |    |   |    |  |   |                                     |   |  |
|----|----|---|----|--|---|-------------------------------------|---|--|
| 12 | 45 | 4 | 15 | Functioning of CAD/CAM system                  |   |                                     |   |  |
|    | 46 |   |    | Features and characteristics of CAD/CAM system |   |                                     |   |  |
|    | 47 |   |    | Application areas for CAD/CAM                  |   |                                     |   |  |
|    | 48 |   |    | Introduction: elements of CNC machines         |   |                                     |   |  |
| 13 | 49 |   |    | 5  | 5 | Machine Structure                   |   |  |
|    | 50 |   |    |  |   | Guideways/Slide ways                |   |  |
|    | 51 |   |    |  |   | Introduction and Types of Guideways |   |  |
|    | 52 |   |    |  |   | Factors of design of guideways      |   |  |
| 14 | 53 |   |    |  |   | 5                                   | 5 | Drives:Spindle drives                  |
|    | 54 |   |    |  |   |                                     |   | Feed drive                             |
|    | 55 |   |    |  |   |                                     |   | Spindle and Spindle Bearings           |
|    | 56 |   |    |  |   |                                     |   | ROBOTICS:Definition                    |
| 15 | 57 | 5 | 5  |  |   |                                     |   | Function and laws of robotics          |
|    | 58 |   |    |  |   |                                     |   | Types of industrial robots             |
|    | 59 |   |    |  |   |                                     |   | Robotic systems                        |
|    | 60 |   |    |  |   |                                     |   | Advantages and Disadvantages of robots |

  
Signature of faculty member

  
Signature of i/c HOD