**Lesson Plan**

**Subject : Mechatronics**

Lesson plan Duration : 15 Weeks

Work load (lecture/Practical) per week (in hours): Lectures:3 hours, Practical:2 hours

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| **Lecture No** | **Theory** |
|
| 1 | Introduction to Mechatronics and its Systems |
| 2 | Evolution and Scope of Mechatronics |
| 3 | Measurement Systems, Control Systems |
| 4 | Open and close loop systems |
| 5 | Sequential controllers and microprocessor-based controllers, mechatronics approach |
| 6 | Basics of Digital Technology: Number System |
| 7 | Number system Problem |
| 8 | Boolean algebra, Logic Functions |
| 9 | Karnaugh Maps, Timing Diagrams |
| 10 | Flip-Flops |
| 11 | Applications. |
| 12 | Sensors and transducers: Introduction |
| 13 | Performance terminology-Displacement, Position and Proximity |
| 14 | Velocity and motion, force |
| 15 | Fluid Pressure-Temperature Sensors-Light Sensors-Selection of Sensors-Signal Processing. |
| 16 | Pneumatic and Hydraulic actuation systems: actuation systems |
| 17 | Pneumatic and hydraulic systems |
| 18 | Directional control valves, pressure control valves |
| 19 | Cylinders, process control valves |
| 20 | Rotary actuators |
| 21 | Mechanical actuation systems: Mechanical systems |
| 22 | Types of motion, kinematics chains, cams |
| 23 | Gear trains, ratchet and pawl |
| 24 | Belt and chain drives |
| 25 | Bearings |
| 26 | Mechanical aspects of motor selection |
| 27 | Microprocessor: Introduction, Architecture, Pin Configuration |
| 28 | Instruction set, Programming of Microprocessors using 8085 instructions |
| 29 | Interfacing input and output devices-Interfacing D/A converters and A/D converters, Applications |
| 30 | Temperature control, Stepper motor control |
| 31 | Traffic light controller |
| 32 | Programmable Logic Controller: Introduction, Basic structure |
| 33 | Input/output Processing, Programming |
| 34 | Mnemonics, Timers, Internal relays and counters |
| 35 | Data handling, Analog Input/Output |
| 36 | Selection of a PLC |
| 37 | Robotics: Introduction, types of robots |
| 38 | Robotic control, Robot drive systems |
| 39 | Robot end effectors |
| 40 | Selection parameters of a robot |
| 41 | Applications |
| 42 | Introduction to Mechatronics and its Systems |
| 43 | Evolution and Scope of Mechatronics |