



**CENTRE OF EXCELLENCE IN MANUFACTURING  
NATIONAL INSTITUTE OF TECHNOLOGY,  
TIRUCHIRAPPALLI**

**Mechatronics Lab**

**Mechatronics System**

**Duration: 40 Hours**

**PREREQUISITES**

Basic Knowledge in Algebra & sensors and Actuators

**WHO SHOULD ATTEND**

Engineering student, Industry People, Research Scholars

**INTRODUCTION**

**8 Hours**

Introduction to Mechatronics – Mechatronics Architecture -Basic Component- Application – Advantage/Disadvantage – Types of Mechatronics Application – Modular Automation Production System (MAPS)- Multi station of MAPS.

**ELECTRICAL COMPONENT**

**5 Hours**

Introduction-Basic Elements and Quantities-Circuit Diagrams, Datasheet, Schematics-Measurements-Sensors-Actuators-Over Current Protection- Safety issues including Local Regulation-Trouble shooting of the Electrical Component in a Module.

**MECHANICAL COMPONENT**

**2 Hours**

Introduction-Mechatronics System in support of flow of energy- Component for transmitting Torque (e.g. Gears)-Support Component (e.g. Bearing, Gripper)-Troubleshooting in Mechanical Component in Module.

**PNEUMATICS COMPONENT**

**7 Hours**

Introduction-Signal Processing Structure-Circuit Symbols-Actuation of Pneumatic Cylinders-Displacement Step Diagram-Air generation and Distribution-Stroke, Speed Regulation of Pneumatic Actuators-Electrical Actuated Directional Control Valves-Safety Regulation

**DIGITAL FUNDAMENTALS OF PLC**

**18 Hours**

Introduction-Function and Design of Programmable Logic Controller (PLC)-Number system and Digital Logic-Basic Function Modules of PLC-Program Processing-Basic Fundamentals of Programming Language using Step71200-Troubleshooting of the PLC.

**Totally Integrated Automation:** Digital/Analog Modules to Sensors and Actuators – Bit instruction-PLC Program -Communication with Profibus&Profinet – Upload & Download the Program-Online Diagnostic.