

# NITEC IN MECHANICAL TECHNOLOGY

## CERTIFICATION

Credits required for certification:

Core Modules	: 44
Life Skills Modules	: 9
Elective Modules	: 4
<u>Total</u>	<u>: 57</u>

## COURSE STRUCTURE

Module Title	Credits
<b>CORE MODULES</b>	
CAD and 3D Printing	6
Industrial Piping and Valve System	6
Machinery Maintenance	6
Electro Pneumatics and Hydraulics	6
IoT and Electrical Applications	6
Plant Equipment Maintenance	6
Industry Attachment	8
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Metrology	2
Mechanical Fabrication	2
Engineering Design	2
Turning	2
Bearing Technology	2
<b>ELECTIVES (INTER-DISCIPLINARY)</b>	
Advanced PLC Applications	2
Microcontroller Applications	2
Plain Milling	2
Product Prototyping	2
<b>ELECTIVES (GENERAL) AND LIFE SKILLS MODULES</b>	
For details, click <a href="#">here</a>	

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Core Modules

#### CAD and 3D Printing

On completion of the module, students should be able to interpret engineering blueprint drawings, draw engineering components, update engineering drawings and convert 3D models to 2D drawings by using CAD system. Students should also be able to print 3D models from 3D printer and perform free hand sketching of engineering drawings.

#### Industrial Piping and Valve System

On completion of the module, students should be able to carry out minor repair and replacement of fluid supply pipes and fittings; maintain, troubleshoot and repair industrial fluid valves.

#### Machinery Maintenance

On completion of the module, students should be able to maintain and service bearings and basic engineering mechanisms, lubrication systems and mechanical transmission systems; lift and move heavy loads safely. Students should also be able to maintain, troubleshoot and repair machinery and equipment.

#### Electro Pneumatics and Hydraulics

On completion of the module, students should be able to install, maintain and troubleshoot electro-pneumatic and electro-hydraulic systems in plant machinery and auxiliary equipment.

#### IoT and Electrical Applications

On completion of the module, students should be able to program microcontroller using High Level Programming Language, transmit data collected from sensors to Cloud Server to be presented as graphical information. Students should also be able understand types of electrical accessories, connect up simple electrical circuits and replace faulty electrical components.

#### Plant Equipment Maintenance

On completion of the module, students should be able to install, maintain, troubleshoot and repair air compressor system, mechanical conveyor system and industrial fluid pumps.

#### Industry Attachment

On completion of the module, students should be able to acquire and apply a cluster of key technical, social and methodological competencies in the occupation.

### Electives (Course Specific)

#### Metrology

On completion of the module, students should be able to inspect, verify and measure engineering components according to technical drawing using of appropriate tools.

#### Mechanical Fabrication

On completion of the module, students should be able to fabricate and fit engineering components by bench fitting, sawing drilling, reaming and tapping operations according to the specifications in a working drawing.

#### Engineering Design

On completion of the module, students should be able to design mechanical components and create assembly drawings according to given specifications.

#### Turning

On completion of the module, students should be able to interpret engineering blueprint drawings, turn components safely using centre lathe to achieve a linear dimensional accuracy up to class IT11, an angular dimensional accuracy of  $\pm 30'$  and surface roughness between 1.6 to 3.2 microns.

#### Bearing Technology

On completion of the module, students should be able to perform mounting and dismounting of anti-friction bearing with appropriate techniques and tools.

## **Electives (Inter-disciplinary)**

### **Advanced PLC Applications**

On completion of the module, students should be able to apply PLC instructions in the design of an industrial automation project and analogue-to-digital processing using Windows-based PLC programming software.

### **Microcontroller Applications**

On completion of the module, students should be able to design and write programs for simple microcontroller projects.

### **Plain Milling**

On completion of the module, students should be able to interpret technical drawings, mill plain components safely, using a vertical milling machine and supporting tools, to achieve a linear dimensional accuracy of IT10, an angular dimensional accuracy of  $\pm 30'$  and a surface roughness between 1.6 to 3.2 microns.

### **Product Prototyping**

On completion of the module, students should be able to create simple design of a product using 3D CAD software and produce a 3D model of it using basic prototyping devices.

## **Electives (General) and Life Skills Modules**

For details, click [here](#).