

HIGHER NITEC IN ROBOTICS & SMART SYSTEMS

CERTIFICATION

Credits required for certification:

Core Modules	: 50
Life Skills Modules	: 9
Elective Modules	: 4
<u>Total</u>	<u>: 63</u>

COURSE STRUCTURE

Module Title	Credits
CORE MODULES	
Robotics and Applications	7
Electrical Applications	7
Mobile Robotics and Control	7
Smart Sensors and Integration	7
End Effectors	8
Smart Systems and Programming	6
Industry Attachment	8
ELECTIVES (COURSE SPECIFIC)	
Hydraulics	3
Single Board Micro-Controller Applications	2
ELECTIVES (INTER-DISCIPLINARY)	
Internet and Network Security	2
Essentials of Cyber Defence	2
ELECTIVES (JOINT ITE-INDUSTRY)	
Robot Palletizing Operations and Programming	2
ELECTIVES (GENERAL) AND LIFE SKILLS MODULES	
For details, click here	

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

Robotics and Applications

On completion of the module, students should be able to install, program, operate, troubleshoot industrial and collaborative robotic system.

Electrical Applications

On completion of the module, students should be able to set up, design and construct electrical control system and electronic circuits. They should also be able to test and troubleshoot faulty circuits.

Mobile Robotics and Control

On completion of the module, students should be able to apply knowledge of localisation, mapping and obstacles avoidance to perform navigation on mobile robotics platform.

Smart Sensors and Integration

On completion of the module, students should be able to install, integrate and troubleshoot smart sensor system, and apply the system into Industry 4.0 and Internet of Things (IoT).

End Effectors

On completion of the module, students should be able to design end effector using 3D solid modelling, produce end effector using 3D printing, and test end effector based on its application.

Smart Systems and Programming

On completion of the module, students should be able to install, configure and test robot vision system and acquire images through network protocol for analysis; and apply microcontroller programming concept to control microcontroller-based devices and equipment.

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)

Hydraulics

On completion of the elective, students should be able to install hydraulic systems in industrial automation.

Single Board Micro-Controller Applications

On completion of the elective, students should be able to write structured programs to interface with peripheral devices and solve simple problems using single board micro-controller.

Electives (Inter-disciplinary)

Internet and Network Security

On completion of the module, students should be able to identify network and internet security risks and to advise users on countermeasures or preventive actions. They should also be able to participate in a Security Life Cycle project discussion.

Essentials of Cyber Defence

On completion of the module, students should be able to carry out a comprehensive security assessment of a typical SME IT environment, testing for OS vulnerabilities, weaknesses in network & web services. Students will learn the Computer Misuse & Cybersecurity Act (2013) Chapter 50A, how to prepare for a penetration test, reconnaissance & enumeration, and vulnerability assessment. Students will also be taught the necessary countermeasures to mitigate risks of exploitation.

Electives (Joint ITE-Industry)

Robot Palletizing Operations and Programming

On completion of the module, students should be able to operate the palletizing robot system, including editing and modifying programs for different palletizing operations.

Electives (General) and Life Skills Modules

For details, click [here](#).