Core Module Details

Work-Study Diploma in Mechanical Systems Engineering with specialisations in Advanced Robotics Systems

Course Objectives

This course equips trainees with the skills, knowledge, and professional attributes to deploy, operate, integrate, and optimise robotic systems, including industrial, humanoid, and quadruped platforms. Trainees will be equipped to maintain system reliability, minimise downtime, and support engineering operations in real work environments.

On-Campus Training Modules

Module 1: Mechanical Systems Maintenance

On completion of this module, trainees should be able to implement testing procedures and analyse results for follow-up measures, and implement repair and maintenance procedures to ensure the functionality and safe operation of equipment and systems.

Module 2: Engineering Drawing

On completion of this module, trainees should be able to interpret engineering blueprints and equipment specifications, draw engineering components and generate 3D models. He/She should also be able to update engineering drawing, convert 3D model to 2D drawing using CAD software and prepare technical data package for fabrication.

Module 3: Mechanical Systems in Operation

On completion of this module, trainees should be able to set up an optimal operating/workplace environment ensuring adherence to industry specific processes and procedures. He/She should also be able to implement a safety culture, monitor performance of equipment and system components, coordinate maintenance work and prepare technical reports for follow-up.

Module 4: Mechanical Installation

On completion of this module, trainees should be able to apply the principles of equipment lifecycle to perform installation. He/She should also be able to perform testing and commissioning of mechanical equipment and systems in compliance with regulatory requirements and practices, and update technical documentation.

Module 5: Instrumentation & Control

On completion of this module, trainees should be able to perform troubleshooting and root cause analyses on sensors and monitoring systems to identify potential malfunctions and provide solutions. He/She should also be able to perform rectification and calibration to ensure the continuous operations of analog equipment, components and systems.

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Module 6: Robotics Systems
On completion of this module, trainees should be able to collect and interpret system performance data, conduct testing and configure the robotic system to meet equipment performance requirements.

Specialisation: Advanced Robotics Systems

Module 7: Robotic Process Optimization & Safety
On completion of this module, trainees should be able to identify opportunities for improving robotic processes and apply safety protocols in robotic work environments through risk assessment. He/She will also be able to collect and analyse system performance data to support process optimisation and safe operation of robotic systems.

Module 8: Robotics Operation in Work Environments
On completion of this module, trainees should be able to operate and configure robotic systems for optimal performance in work environments. He/She will also be able to program robots for handling operations, maintain robotic systems, and collect real-time data to monitor and support system performance. Aware of the AI tools for use to support data collection.

Module 9: Robots, Humanoid & Quadruped interaction
On completion of this module, trainees should be able to operate humanoid and quadruped robots for tasks through the use of robot interfaces and its' operating system. He/She will also be able to perform routine maintenance checks, assist in setup for applications, and support troubleshooting while monitoring performance of humanoid and quadruped robotic systems.

Module 10: Robotic System Integration & Troubleshooting
On completion of this module, trainees should be able to set up and troubleshoot robotic systems according to workflow and operational requirements. He/She will also be able to interpret schematics and integrate sensors and actuators within control systems, and support integration of robotic systems with modular and automated applications.

Module 11: Company Project
On completion of the module, trainees should have applied their acquired competencies in an authentic project that would value-add to the company.

Off-Campus Training

Module 12: On-the-Job Training

Core Module Details

On completion of the module, trainees should be able to apply the skills and knowledge acquired at ITE College and workplace to take on the full job scope, including supervisory function, where appropriate, at the company.