

**List of Competencies for On-the-Job Training (OJT)  
Work-Study Diploma in Mechanical Systems Engineering**

<b>S/N</b>	<b>List of Competencies (Standard)</b>	<b>Company to indicate '✓' for OJT competencies it can provide</b>
1	Conduct inspection on equipment and system components	
2	Implement maintenance procedures	
3	Repair equipment and system components	
4	Generate 2D drawing	
5	Create 3D model	
6	Prepare technical data package	
7	Maintain optimal workplace conditions	
8	Implement risk management	
9	Coordinate maintenance work	
10	Monitor performance of equipment and system components	
11	Set-up mechanical equipment and system	
12	Perform testing and commission of mechanical equipment and system	
13	Install mechanical components	
14	Conduct testing on sensors and monitoring systems	
15	Troubleshoot faults, malfunctions and maintenance issues	
16	Perform rectification of analog systems	
17	Calibrate equipment and system components	
18	Conduct testing on robotics system	
19	Program robot positions	
20	Configure robotic system parameters	
21	Conduct testing on automation system	
22	Perform troubleshooting on embedded systems and components	
23	Support programming of automation system	
24	Maintain robotic and automation systems	
25	Implement quality control and assurance procedures	
26	Conduct compliance check/audit	
27	Implement continuous improvement activities	
28	Conduct risk assessment	

S/N	List of Competencies (Standard)	Company to indicate '✓' for OJT competencies it can provide
29	Implement risk management plan and controls	
30	Respond to emergency situations and crisis	
31	Develop maintenance plan and schedule	
32	Perform resource planning	
33	Manage team and vendor performance	
	<b>Sub-total of Competencies (Standard)</b>	
<b>List of Competencies (Company-specific)</b>		
1		
2		
3		
4		
5		
6		
7		
8		
9		
	<b>Sub-total of Competencies (Company-specific)</b>	

**Note:**

- a) Company must be able to provide OJT for at least **75%** of the List of Competencies (Standard).
- b) If company is unable to meet the 75%, please propose alternate **course-related** competencies which are unique to company operations. Alternate competencies are capped at 25%.  
*[i.e. 50% of the list of competencies (standard) + 25% alternate competencies (Company-specific)].*
- c) All alternate competencies (Company-specific) must be reviewed and endorsed by ITE.
- d) Trainees must receive OJT and be assessed for **All** competencies selected in this List.

Total no. of competencies selected by company for OJT

Total no. of competencies listed (*standard & company specific*)

Percentage of selected competencies

**Completed By:**

\_\_\_\_\_  
**Name**

\_\_\_\_\_  
**Company**

\_\_\_\_\_  
**Designation**

\_\_\_\_\_  
**Date**

<b>For ITE's Completion</b>			
<b>Reviewed by CED / College</b> <i>(For Company-specific Competencies)</i>			<b>Verified by IBT Officer</b>
Name:			Name
Designation:		Date:	& Date:

*Version: June'23*

# **WORK-STUDY DIPLOMA IN MECHANICAL SYSTEMS ENGINEERING**

## **Course Objective**

This Work-Study Diploma course aims to equip trainees with the engineering skills, knowledge and professional attributes to install, maintain and troubleshoot mechanical equipment and smart systems, implement quality control and risk management procedures, and manage engineering activities to maximise resources and minimise equipment downtime, ensuring the optimal operating condition of the mechanical system.

## **Module Objectives**

### **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.

### **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.

### **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.

### **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.

### **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.

## **Robotics Systems Engineering**

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.

## **Smart Systems Engineering**

On completion of this module, trainees should be able to diagnose faults and troubleshoot any abnormality detected on robotic and automation systems. He/She should also be able to support programming of automation system for optimal performance, and maintain the robotic and automation system for operation.

## **Quality & Project Management**

On completion of this module, trainees should be able to implement and monitor adherence to Quality Assurance/ Quality Control (QA/QC) procedures and Quality System Management (QSM) requirements. He/She should be able to carry out continuous improvement activities to optimise the quality and efficiency of system and maintenance workflows.

## **Risk Control & Management**

On completion of this module, trainees should be able to conduct equipment and system risk and reliability analyses to mitigate risks. He/She should also be able to implement and communicate risk management plans and control measures to stakeholders, and support crisis response and recovery.

## **Engineering Resource Management**

On completion of this module, trainees should be able to coordinate with internal and external stakeholders to plan and prioritise maintenance activities based on maintenance data analytics. He/She should also be able to perform resource planning to support asset lifecycle activities, as well as manage the maintenance team and vendors ensuring resourcing plans are adhered to meet operational targets.

# Off-the-Job Modules List

## **1<sup>st</sup> Year Modules**

1. Mechanical Systems Maintenance
2. Engineering Drawing
3. Mechanical Systems in Operation
4. Mechanical Installation

## **2<sup>nd</sup> Year Modules**

5. Instrumentation & Control
6. Robotics Systems Maintenance
7. Smart Systems Engineering
8. Quality & Project Management

## **3<sup>rd</sup> Year Modules**

9. Risk Control & Management
10. Engineering Resource Management
11. Company Project

# TRAINING PATTERN (DAY RELEASE)

✿ 1 day on campus

Course	Day or Block Release	Training at ITE Campus	Day	Exams
<b>WSDip in Mechanical Systems Engineering</b>	Day	<b>Y1,Y2 &amp; Y3:</b> Per semester (6 mths) 21 wks: 1 day/wk (total 160 hrs over 21 wks)	All Off-JT is full day. Class: Friday	<u>Y1 &amp; Y2:</u> <u>End Feb or Mar Exam period</u> <u>Y3:</u> <u>NIL</u>