WORK-STUDY DIPLOMA IN MICROELECTRONICS

MODULE OBJECTIVES

Core Modules

Workplace Safety & Health (Microelectronics)
On completion of this module, trainees should be able to identify workplace hazard and apply proper usage of the personal protective equipment (PPE). They should also be able to apply skills and knowledge in Electro Static Discharge (ESD), workplace risk and environmental management to ensure a safe workplace.

Wafer Manufacturing Process
On completion of this module, trainees should be able to perform cleanroom protocol and troubleshoot wafer manufacturing process.

Assembly & Testing
On completion of this module, trainees should be able to apply assembly and testing methodology for semiconductor manufacturing.

Equipment Maintenance
On completion of this module, trainees should be able to implement equipment maintenance operation to optimise performance.

Sensor Technology
On completion of this module, trainees should be able to install, test, integrate and troubleshoot sensor system in industrial applications.

Facility System Maintenance
On completion of this module, trainees should be able to coordinate facility system maintenance to optimise performance.

Industrial Automation System
On completion of this module, trainees should be able to maintain automation system and interpret system performance metrics for performance verification.

Computer Programming & IoT Integration
On completion of this module, trainees should be able to write application program to integrate devices into system using programming concept and language.

Data Analytics Application
On completion of this module, trainees should be able to analyse data by reviewing data requirements for overall equipment performance enhancement.

Robotic Controls
On completion of this module, trainees should be able to apply the concepts of logic and sequential control in industrial automation.

Quality Management Tools
On completion of this module, trainees should be able to apply quality management tools to achieve continuous improvement in equipment maintenance.

Technical Writing & Communication (Microelectronics)

On completion of this module, trainees should be able to write and present technical report. They should also be able to apply communication and supervision skills to build essential relationships at the workplace.

Company Project

On completion of this module, trainees should be able to plan, supervise and execute microelectronics project for manufacturing process improvement.

On-The-Job Training I

On completion of this module, trainees should be able to apply and integrate Year 1 skills and knowledge acquired at ITE College, and further develop competencies at the workplace.

On-The-Job Training II

On completion of this module, trainees should be able to apply and integrate Year 2 skills and knowledge acquired at ITE College, and further develop competencies at the workplace.

On-The-Job Training III

On completion of this module, trainees should be able to apply and integrate Year 3 skills and knowledge acquired at ITE College, and further develop competencies at the workplace.

OJT LIST OF COMPETENCIES

Course Title: Microelectronics **Level:** Work-Study Diploma

LIST OF COMPETENCIES (STANDARD)	
Workplace Safety and Health (Microelectronics)	
1	Manage day-to-day Workplace Safety and Health (WSH) activities
2	Implement safe work practices
3	Implement risk control measures
4	Implement emergency preparedness and response plans
5	Perform Electro Static Discharge (ESD) handling technique
Wafer Manufacturing Process	
6	Implement good manufacturing practices
7	Perform wafer manufacturing processes
8	Analyse wafer manufacturing stability with process monitoring tools
9	Measure process parameter with metrology technique
Assembly and Testing	
10	Establish manufacturing practices for Integrated Circuit (IC)
11	Set up IC back-end manufacturing equipment
12	Set up metrology equipment for IC assembly
13	Perform electrical testing on IC packaging
Equipment Maintenance	
14	Perform routine check on semiconductor system
15	Maintain mechanical drive system
16	Perform system alignment and levelling
17	Test vacuum and plasma systems
Sensor Technology	
18	Set up sensor system
19	Establish communication between sensor and controller
20	Perform functional test for sensor system
21	Troubleshoot sensor system
Facility System Maintenance	
22	Perform cleanroom control procedure
23	Monitor semiconductor facility system
24	Maintain semiconductor facility system
Industrial Automation System	
25	Perform operational test on automation system

26	Troubleshoot automation system
27	Maintain automation system
Computer Programming and IoT Integration	
29	Integrate devices into IoT system
30	Perform functional test on IoT system
31	Verify IoT system performance
Data Analytics Application	
32	Interpret data collected from manufacturing activity
33	Analyse data for manufacturing equipment enhancement
34	Perform data visualisation for equipment performance
35	Review data for manufacturing equipment enhancement
Robotic Controls	
36	Perform operational test on industrial robotic system
37	Troubleshoot industrial robotic system
38	Perform preventive maintenance of industrial robotic system
Quality Management Tools	
39	Apply quality management tools for continuous improvement
40	Perform root cause analysis
41	Develop solution for project management
Technical Writing and Communication	
42	Produce technical reports
43	Communicate and present at meeting and discussion