Module Synopsis
Diploma in Engineering (Mechanical Technology)

MC 1:	Modular Certificate in Basic Engineering Technology	(180 hours)
1.	**MM9101: Computer-Aided Drafting**	**(60 hours)**
	This module provides the knowledge of interpreting and preparing engineering drawing of mechanical parts based on ISO Standard recommendations. Participants will be able to use Computer-Aided Drafting & Design (CADD) software to create parametric solid models of mechanical parts and generate the corresponding basic detailed drawings.	
2.	**MM9304: Thermofluid Systems**	**(60 hours)**
	This module will give a strong basic foundation to students in Thermodynamics and Fluid Mechanics. Topics covered include basics of fluid mechanics, perfect gas and steam. The course is practical based and lecturers are supplemented by comprehensive tutorials. Hands-on laboratory classes will reinforce concepts and will allow students to develop robust practical skillsets on the topics studied.	
3.	**MM9400: Statics & Dynamics**	**(60 hours)**
	This module provides students with the basic concepts of applied mechanics; namely units and dimensions, equilibrium conditions, friction, kinematics and Newton's laws of motion.	

MC 2:	Modular Certificate in Intermediate Engineering Technology	(180 hours)
1.	**MM9305: Thermofluid Power**	**(60 hours)**
	This module aims to provide students with fundamental knowledge and basic principles in the Second Law of Thermodynamics Power Cycles, Air compressors, Conservation of Momentum and Conservation of Energy. Hands-on laboratory classes will reinforce the concepts learnt and will allow to develop robust practical skillsets on the topics studied.	
2.	**MM9401: Mechanics of Materials & Machines**	**(60 hours)**
	This module is a continuation from Statics & Dynamics and provides basic concepts of Direct Stress and Strain, Shear Force and Bending Moment Diagrams, First and Second Moment of Area, Bending Theory, Torsion Theory, Torque and Moment of Inertia, Work Power Energy, Simple Lifting Machines and Centripetal Force. These will enable students to apply these to analyse the forces and stresses acting on simple engineering structures and machines.	
3.	**MM9402: Engineering Materials**	**(60 hours)**

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This module provides students with an introduction to the basic properties and applications of general engineering materials such as steel, cast iron, aluminium, copper, thermo-setting and thermo-plastics. Students will also be taught the practical skills in mechanical testing, common Non-Destructive Testing (NDT) and metallographic techniques, as well as the knowledge in heat treatment of metallic materials and casting processes.

MC 3:	**Modular Certificate in Advanced Engineering Technology**	**(180 hours)**
1.	**MM9202: Mechanics of Machine Elements**	**(60 hours)**

This module introduces the analysis of stress and strain in bodies under a static equilibrium and basic concepts of dynamics. Applications include the design of machine and structural elements.

2.	**MM9205: Robotics & Mechanical Design**	**(60 hours)**

This module aims to equip students with the knowledge of robot programming and mechanical design. Robot programming comprise of setting up robot to perform assembly, material handling, machine tending and dispensing work with the help of vision system and sensor technology. Mechanical design encompass of concepts, principles, design processes, and best practices to realise a quality end effector and tooling design. Students will 3-D print the designed mechanical components and integrated it with robot to perform industrial processes.

3.	**MM9306: Engineering Thermodynamics**	**(60 hours)**

This module aims to provide students with basic knowledge of heat transfer, combustion, steam nozzles, steam turbine cycles and gas turbine cycles. Lectures will be conducted to introduce key concepts and principles involved. Tutorials will be conducted for individual classes where students will consolidate their knowledge learnt in lectures by doing both descriptive and calculation questions under the guidance of a tutor.

MC 4:	**Modular Certificate in Automation Technology**	**(180 hours)**
1.	**MM9102: Computer-Aided Drafting & Design**	**(60 hours)**

This module will enable the participants to use Computer-Aided Drafting & Design (CADD) software to create parametric assembly models of mechanical devices, generate the

corresponding assembly drawing and fully detailed drawings of parts with appropriate limits and fits, geometrical tolerances based on ISO Standard recommendations.

2.	**MM9103: Machine Elements & Mechanism Design**	**(60 hours)**

This module introduces the application of limits and fits, geometrical dimensioning and tolerances for controlling the sizes and forms of parts to meet their design functions. The module also includes design and selection of standard engineering machine elements such as locking and fastening devices, bearing, gear-drives, belt-drives and chain-drives required in mechanical systems.

3.	**MM9200: Industrial Automation**	**(60 hours)**

This module provides students with the fundamental knowledge and hands-on skills in pneumatic relay control system and Programmable Logic Controller (PLC) relevant to the local industries. At the end of the module, students will be able to design and assemble automation control circuits.

* Students must select either MC 5A or MC 5B during course registration.

MC 5A:	**Modular Certificate in Machining Technology ***	**(180 hours)**
1.	**MM9500: CNC Turning Technology**	**(60 hours)**

This module aims to provide students with a working knowledge of CAD/CAM programming and setting up of CNC machine to produce turning parts. Selection of appropriate machining parameters to achieve part specifications will be also addressed.

2.	**MM9501: CNC Milling Technology**	**(60 hours)**

This module aims to provide students with a working knowledge on CAD/CAM programming and setting up of CNC machine to produce milling parts. Selection of appropriate machining parameters to achieve part specifications will be also addressed.

3.	**MM9502: Advanced Machining Processes**	**(60 hours)**

This module aims to provide students with an integral approach to parts and components machining. Topics include job planning, work holding, tool selection and advanced machining processes. Students will also be provided with an introduction on multi-axis machine operations.

Module Synopsis
Diploma in Engineering (Mechanical Technology)

* Students must select either MC 5A or MC 5B during course registration.	
MC 5B: Modular Certificate in Engine & Fluid Technology *	**(180 hours)**
1. MM9505: Electrical & Control System	**(60 hours)**
Electrical and Control Systems provides the students with a comprehensive knowledge in electrical and control systems fundamentals needed in industrial applications. Topics covered include the concepts, theories, laws and their applications to diodes, transistors, machines or equipment in relation to direct current (D.C) and alternate current (A.C).	
2. MM9506: Engine Technology	**(60 hours)**
This module introduces students to 4-stroke cycle internal combustion engines. Topics covered include basic engine performance and power calculations, followed by an introduction to the mechanical part of engines, engine systems – induction, oil, fuel, fuel metering and ignition. The student will learn of the engine fundamentals. Lubrication and cooling system.	
3. MM9507: Hydraulic System	**(60 hours)**
This module introduces students to basic hydraulic fundamentals and principles of operation of such system on port equipment. The topics covered include hydraulic fluids and seals, types and use; fluid lines and fittings, types and functionality; hydraulic system components, roles and functionality; crane hydraulic systems and specified basic components found in port equipment.	