

## Module Synopses

### **MC1 Certificate in Engineering Fundamentals**

#### **Module 1 Engineering Drawings**

Provides knowledge to interpret engineering or technical drawings of mechanical parts welded structures and assemblies in accordance with ISO standards.

#### **Module 2 Engineering Materials**

Introduces the basic properties and applications of common engineering materials such as steels, cast irons, aluminium, copper, plastics and elastomers, including processes such as heat treatment and casting.

#### **Module 3 Failure Analysis & Non-Destructive Testing**

Provides knowledge to carry out failure analysis and non-destructive testing, which includes ultrasonic, dye penetrant, eddy current, magnetic particle and x-ray.

<i>(A) Rolling Stocks Track (OJT)</i>	<i>(B) Permanent Way Track (OJT)</i>
<b>MC2 Certificate in Train Mechanical System</b>	<b>MC2 Certificate in Permanent Way System</b>
<p>Introduces the various systems found within the rapid transit environment, which includes signalling, communication, tracks, rolling stock and building services; and how to identify and manage hazards and risk at the workplace.</p>	<p>Introduces the various systems found within the rapid transit environment, which includes signalling, communication, tracks, rolling stock and building services; and how to identify and manage hazards and risk at the workplace.</p>
<p>Provides knowledge to carry out schedule maintenance on mechanical equipment of trains and train-cars in the depot, which includes air-conditioning system, pneumatic system, bogies and couplers.</p>	<p>Introduces the different types of track system and components used, which includes the functions of the Point and Crossing, and the Third Rail that supplies the traction power.</p> <p>Provides knowledge to carry out visual inspection of tracks, and how abnormalities are categorised and recorded into fault codes and severity indexes for appropriate maintenance interventions or immediate remedial actions.</p>
<b>MC3 Certificate in Train Electrical System</b>	<b>MC3 Certificate in Track Maintenance</b>
<p>Provides knowledge to carry out schedule maintenance on electrical equipment of trains and train-cars in the depot, which includes the Total Information Management System (TIMS) and passenger communications.</p>	<p>Provides knowledge on track renewal at grade, on viaduct and in tunnels; and how to use of the lifting appliances, equipment, tools and machinery for track renewal work for track renewal work.</p>
	<p>Introduces preventive and corrective maintenance of the Third Rail parts and</p>

<p>Provides knowledge to carry out schedule maintenance on electrical power supply equipment of trains and train-cars in the depot, which includes auxiliary system and propulsion system.</p>	<p>components, which includes conductor rails, mid-point anchors, ramps, expansion joints and support assembly.</p> <p>Provides knowledge on how to safely access the tracks for maintenance activities and how to operate an engineering train (locomotive).</p>
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## **MC4: Certificate in Engineering Mechanics**

### **Module 1 Statics & Dynamics**

Introduces the basic concepts of engineering mechanics, namely units and dimensions, equilibrium conditions, friction, kinematics and Newton's laws of motion.

### **Module 2 Mechanics of Materials & Machines**

Continues from Statics & Dynamics and teaches how basic solid mechanics is applied to solving engineering problems. The fundamentals of machine components are included.

### **Module 3 Mechanics of Machine Elements & Dynamics**

Provides further knowledge on solid mechanics with particular applications in the design of machine elements and structures.

## **MC5 Certificate in Thermofluids Engineering**

### **Module 1 Thermofluid Systems**

Introduces the fundamentals of thermodynamics and fluid mechanics, namely heat, work, perfect gas laws and the 1st law of thermodynamics. Use of steam tables, basics of pressure and flow rate in fluids, and the mass conservation law are also covered.

### **Module 2 Thermofluid Power**

Provides further knowledge on thermodynamics and fluid mechanics with particular applications in air compressors, gas and vapour cycles.

### **Module 3 Engineering Thermodynamics**

Provides further knowledge of steam cycles and gas turbine cycles, steam nozzles and heat transfer.