

# Formal Training Scheme to Associate Membership

## CORE OBJECTIVES (MCL)

<b>1. Mechanical Engineering Fundamentals</b>	Code	ES Initials and Date of Assessment			
		G	K	E	C
<b>1.1 Common Engineering Metallic and Non Metallic Material</b>  <ul style="list-style-type: none"> <li>- Types</li> <li>- Properties</li> <li>- Material Specifications</li> <li>- Use</li> <li>- Special Treatments (e.g. Heat)</li> <li>- Surface Coatings / Finishing</li> </ul>	C				
<b>1.2 Material Shaping</b>  <b>(a) Trading Methods</b> <ul style="list-style-type: none"> <li>- Turning</li> <li>- Milling</li> <li>- Grinding</li> <li>- Fitting</li> <li>- Drilling</li> </ul> <b>(b) Computer Aided Methods (CNC)</b> <ul style="list-style-type: none"> <li>- Turning Centres</li> <li>- Machining Centres</li> <li>- Jig Borers</li> <li>- Jig Grinders</li> <li>- Milling Machines</li> </ul> <div style="margin-left: 100px;"> <ol style="list-style-type: none"> <li>1. Operational Parameters</li> <li>2. Reliability Factors</li> <li>3. Quality/Accuracy of Product</li> <li>4. Checks of machine Accuracy</li> </ol> </div>	*C/E				
<b>1.3 Materials Forming Processing</b>  (Manual & Computer Aided) <ul style="list-style-type: none"> <li>- Related Processing Equipment (e.g. EDM)</li> <li>- Sheet Metal</li> <li>- Moulds &amp; Die</li> <li>- Extrusion</li> </ul>	*C/E				

\* As Appropriate to the Company.

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1. <b>Mechanical Engineering Fundamentals</b>	Code	ES Initials and Date of Assessment			
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<b>1.4 Material joining</b> <ul style="list-style-type: none"> <li>- Welding (hand &amp; auto)</li> <li>- Sheet Metal</li> <li>- Soldering</li> <li>- Mechanical Fastenings (Rivets, nuts &amp; bolts)</li> </ul>	C				
<b>1.5 Machinery Reliability</b> <ul style="list-style-type: none"> <li>- Planning Maintenance procedures</li> <li>- Lubrication (Range, Uses &amp; Additives)</li> <li>- Condition Health Monitoring</li> </ul>	C				
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<b>2. Engineering Design</b>	<b>Code</b>	<b>ES Initials and Date of Assessment</b>			
		<b>G</b>	<b>K</b>	<b>E</b>	<b>C</b>
<b>2.1 Design and Office Practice</b> <ul style="list-style-type: none"> <li>- Stages of Design</li> <li>- Information Retrieval</li> <li>- Use of Computer Packages</li> <li>- Codes of Practice</li> <li>- Specifications &amp; Standards</li> <li>- Design Appreciation</li> </ul>	<b>C</b>				
<b>2.2 Computer Aided Engineering Application</b>	<b>E</b>				
<b>2.3 Design Aspects</b> <p align="center">(At least 4 of the following)</p> <ul style="list-style-type: none"> <li>- Types, Selection and Application of Various Systems and Required Equipment</li> <li>- Measures</li> <li>- Environmental Impacts</li> <li>- Specifications</li> <li>- Statutory Requirements</li> <li>- Energy Efficiency and Energy Conservation</li> <li>- Initial &amp; Running Cost Estimates</li> <li>- Customer Requirements</li> <li>- Utilities Planning</li> <li>- Spatial Requirements</li> <li>- Buildability</li> <li>- Maintainability</li> <li>- Alternative Solutions</li> </ul>	<b>*C/E</b>				
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3. Operational Reliability	Code	ES Initials and Date of Assessment			
		G	K	E	C
<b>3.1 Automation</b> - Automatic Control System & Units - Computer Aided Manufacture / Control	*C/E				
<b>3.2 Installation Testing &amp; Commissioning</b> - Procedures - Preparation - Testing/Setting to work - Guarantees & Defects	*C/E				
<b>3.3 Instrumentation</b> - Selection - Range and Accuracy - Performance Monitoring - Calibration	*C/E				
<b>3.4 Quality Procedures</b> - Quality Management System - International Standards - Quality Control/Quality Assurance Procedures	*C/E				
<b>3.5 Maintenance</b> - Planning and Implementation of Maintenance Programmes for Reliability and Maintainability - Types of Maintenance System - Computer Aided Maintenance Management - Preventive Maintenance - Emergency and Major Repair - Diagnostic Techniques	*C/E				
<b>3.6 Operation</b> - Procedures - Supervision/Management					
*As Appropriate to the Company					

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4. Engineering Administration & Management	Code	ES Initials and Date of Assessment			
		G	K	E	C
4.1 Interpretation, preparation and communication of requirements, specifications and drawings	*E/K				
4.2 Materials/ equipment procurement procedures, tender and or contract appraisal and administration	*E/K				
4.3 Planning and Budgeting	*E/K				
4.4 Estimating labour, materials, installation and transport costs	*E/K				
4.5 Project/ Work Scheduling	*E/K				
4.6 Project/ Work Supervision	*C/E				
4.7 Reports & Presentations	*C/E				
- written reports, operation manuals, etc					
- presentation technique					
*As Appropriate to the Company					

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5. Technology in specialised areas	Code	ES Initials and Date of Assessment			
		G	K	E	C
<p><b>5.1 The trainee must demonstrate to have gained an in-depth experience in one of the areas listed below and ability to apply technology to the design, installation, testing, commissioning, maintenance and improvement.</b></p> <ul style="list-style-type: none"> <li>- Mechanical plant</li> <li>- Pumping system</li> <li>- Air conditioning and ventilation system</li> <li>- Control system</li> <li>- Others as approved</li> </ul>	*C/E				
* As Appropriate to the Company.					