

HONG KONG IGDS - MSC MODULE OUTLINE

Subject Title	Quality, Reliability and Maintenance (QRM)	
	<i>HK PolyU</i>	<i>WarwickU</i>
Subject Code	ISE5760	WM9F8-15
Credit Value	3	15
Level	Level 5	Taught Postgraduate Level
Pre-requisite/ Co-requisite/Exclusion	None but some preliminary reading of quality, reliability and maintenance would be beneficial.	
Introduction	Product and service quality are key factors in the success of a business in terms of customer satisfaction, reduction in cycle time and costs, elimination of error and rework and thus improving profitability and competitiveness. This module provides the opportunity to learn about the quality management theories and practice and to develop skills in the application of key quality and reliability tools and techniques. The module also develops student knowledge of maintenance methods in order to assess how to optimize product and service availability and introduces the concept of equipment asset management.	
Objectives	<p>No 1 To develop the skills and knowledge of Quality, Reliability and Maintenance by: critically evaluating Quality Management methodologies and tools.</p> <p>No 2 To capture customers' requirements using Quality Function Deployment, explore design for reliability concepts and techniques such as Failure Modes and Effects Analysis, Reliability Testing and Fault Tree Analysis, critical evaluate maintenance methods and thus the importance of equipment asset management to any business organisation.</p>	
Intended Learning Outcomes (ILO's) (Note 1)	<p>Upon completion of the subject, participants will be able to:</p> <p>No 1 develop a critical understanding of Quality Management theories</p> <p>No 2 analyse lifetime data to measure reliability performance</p> <p>No 3 develop a conceptual understanding of maintenance philosophies</p> <p>No 4 investigate the role of equipment asset management in an engineering business</p> <p>No 5 Evaluate how quality, reliability and maintenance tools are applied to aid customer satisfaction</p> <p>No 6 Reflect on how the module enhances the product quality, reliability and maintenance of an engineering business</p>	
Indicative Syllabus Topics (Note 2)	<p>No 1 Introduction to Quality, Reliability, and Maintenance concepts</p> <p>No 2 Comparison of Quality Management philosophies (in-module assessment)</p> <p>No 3 Application of Quality Tools – SPC and Root Cause Analysis</p> <p>No 4 Application of Reliability and Maintenance tools - FMEA, FTA, RBD</p> <p>No 5 Reliability Testing approaches – ALT, HALT, ESS, HASS</p> <p>No 6 Measuring quality and reliability using process capability, MTBF and Weibull analysis</p>	

	No 7 Maintenance Methods and applications including RCM, TPM and CBM. No 8 Application of Kano and QFD for capturing customer requirements No 9 Design for Six Sigma concepts No 10 Equipment Asset Management and ISO55000																																	
Teaching/Learning Methodology <i>(Note 3)</i>	<p>Lectures and case studies are used to deliver the various topics in this module. Since the case studies are exclusively based on real life situations, they help to demonstrate how to apply the techniques learnt. Therefore, they enhance the learning objectives and learning outcomes.</p> <p>Alignment between Teaching/Learning Methodologies and ILOs:</p> <table border="1" data-bbox="570 537 1422 821"> <thead> <tr> <th rowspan="2">Teaching/Learning Methodologies</th> <th colspan="6">Intended Subject Learning Outcomes to be assessed</th> </tr> <tr> <th>No 1</th> <th>No 2</th> <th>No 3</th> <th>No 4</th> <th>No 5</th> <th>No 6</th> </tr> </thead> <tbody> <tr> <td>Lecture</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Practical classes</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> </tbody> </table>	Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed						No 1	No 2	No 3	No 4	No 5	No 6	Lecture	√	√	√	√	√	√	Practical classes	√	√	√	√	√	√						
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Reading List and References	<p>The list given to participants covers core texts and embraces all the topics covered in the module. The references provided support the taught material. They can be found in the Folder Notes given to participants at the commencement of the module.</p>																																	

Note 1: Intended Learning Outcomes

Intended learning outcomes state what students should be able to do or attain upon completion of the subject. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/ Indicative Syllabus

The syllabus adequately addresses the intended learning outcomes. At the same time over-crowding of the syllabus has been avoided.

Note 3: Teaching/Learning Methodology

This section includes a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method

This section includes the assessment method(s) used and its relative weighting, and indicates which of the subject intended learning outcomes that each method assesses. It also provides a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.