

## Liverpool John Moores University

Title: QUALITY SYSTEMS,RISK AND RELIABILITY  
Status: Definitive  
Code: **6509ENGRIV** (117222)  
Version Start Date: 01-08-2016

Owning School/Faculty: Maritime and Mechanical Engineering  
Teaching School/Faculty: Maritime and Mechanical Engineering

Team	Leader
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**Academic Level:** FHEQ6  
**Credit Value:** 20  
**Total Delivered Hours:** 50  
**Total Learning Hours:** 200  
**Private Study:** 150

### Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	36
Tutorial	12

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam		50	2
Essay	Essay		25	
Essay	Essay		25	

### Aims

*To introduce students to the principles and techniques of Total Quality Management, Risk and Reliability Engineering. To examine in detail the elements which contribute towards the quality management systems from the perspectives of people, techniques and systems. To equip the student with the means to identify, assess, evaluate and control the risks inherent in organizations.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Understand the concepts and principles of total quality management
- 2 Apply a range of quality techniques (e.g. QFD, FMEA, SPC) to monitor, analyze and improve manufacturing processes
- 3 Identify and assess outcomes and consequences of hazards, make decisions based on evaluation and assessment of risk.
- 4 Relate human factors to risk and its acceptability, apply principles of safety engineering and decision making.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Exam	1	2	3	4
Essay 1	1	2		
Essay 2	3	4		

## Outline Syllabus

*Background and evolution of the quality movement.*

*Quality gurus and the cost of quality.*

*Quality control procedures, process capability and statistical process control techniques.*

*Quality management systems - standards and models: ISO9000:2000.*

*Business improvement techniques - FMEA, QFD and value management.*

*The six sigma approach, its methodologies, the DMAIC project model.*

*Health and Safety Management and Loss Control: Definitions of the commonly used terms in risk analysis, e.g. risk, hazard, danger, chance, uncertainty and probability.*

*Decision making based on assessment and evaluation of risk: Inclusion of emergency and contingency planning in the decision making process.*

*Human Factors: Application of typical human error assessment models. Attitudes towards risk and its acceptability.*

*Safety Engineering: Performance standards and the measurement of safety outcomes.*

*Standard failure prevention techniques: Failure mode and effects analysis, Fault tree analysis and Event tree analysis. Statistical analysis of reliability. Design for safety.*

*The relevant standards.*

## Learning Activities

This module is taught through a combination of lectures, tutorial, small group work, video case studies and workshops, use of relevant software where appropriate

## **Notes**

This module focuses on the practical application of quality management and risk and reliability engineering techniques used in both service and manufacturing industry.