

Liverpool John Moores University

Title: Hazard, Risk and Reliability
Status: Definitive
Code: **7008ENGEAT** (117630)
Version Start Date: 01-08-2016

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

Team	Leader
Christian Matthews	Y
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Academic Level: FHEQ7 **Credit Value:** 20 **Total Delivered Hours:** 38
Total Learning Hours: 200 **Private Study:** 162

Delivery Options

Course typically offered: Non Standard Year Long

Component	Contact Hours
Lecture	30
Tutorial	5

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam		70	3
Essay	Essay		30	

Aims

To equip the student with the means to identify, assess, evaluate and control the hazards and risks inherent in modern electrical power networks. Completing this module should enable the student to investigate failures and prevent their recurrence through the development of proactive management strategies.

Learning Outcomes

After completing the module the student should be able to:

- 1 Examine and assess outcomes and consequences of hazards
- 2 Make decisions based on evaluation and assessment of risk
- 3 Apply techniques of safety management to risk acceptability
- 4 Apply principles of safety engineering and decision making
- 5 Use standard failure prevention techniques to analyse reliability, maintainability and availability

Learning Outcomes of Assessments

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

Exam	1	2	3	4	5
Coursework	2				

Outline Syllabus

Mathematics & Statistics: Overview of statistical mathematics used in hazard and risk assessment. Probability Density Functions (PDF), Cumulative Distribution Function (CDF).

Standard failure prevention techniques: Failure mode and effects and criticality analysis and simulation, fault tree analysis and event tree analysis and utilising. Statistical analysis of reliability. Software tools used for analysis of risk and reliability problems.

Health & 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. Use of failure statistics.

Organisational policies for safety and health: Legal requirements, safety policies as a basis for safety management and loss control.

Techniques of safety management: Utilising risk reduction measures and loss control techniques.

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.

Measurement of success and failure probabilities. Studies of plant reliability and availability.

Hazard operability studies: Application to complex plant.

Design for safety: including related standards.

Learning Activities

Lectures, tutorials and private study.

Notes

This module is delivered in a block release format and will require full-time attendance from all students for the duration of the scheduled delivery period..

The module equips the student to perform legally required assessments of risk and hazard in process and related industry. It outlines the contribution of human factors to inherent risks and applies safety engineering techniques to their reduction.

The teaching and learning activities in this module will be supported by the research activities of Professor Jin Wang of the LJMU Risk and Reliability research group.