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MODULE DESCRIPTOR

Module Title

Subsea Systems Reliability and Risks

Reference	ENM239	Version	4
Created	April 2017	SCQF Level	SCQF 11
Approved	August 2015	SCQF Points	15
Amended	September 2017	ECTS Points	7.5

Aims of Module

This module provides an understanding of the principles of reliability, inspection, maintenance and maintainability for subsea engineering systems.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Analyse key standards and regulations guiding subsea risk and reliability in the UK and internationally
- 2 Analyse systems critical to subsea risk reduction, reliability, availability and maintainability.
- 3 Critically analyse and discuss risk, reliability and maintainability principles, concepts and requirements applicable to subsea systems
- 4 Perform basic risk, reliability and maintainability calculations
- 5 Apply relevant techniques and methods that support the entire subsea systems lifecycle for subsea design and effective operations
- 6 Develop strategies for subsea risks and reliability management and implementation

Indicative Module Content

ALARP Concept; Markov Model & Calculations; Common Cause Failure Calculations Techniques; Proof Testing; Diagnostics & Condition Monitoring; Alarm Monitoring and Strategy to support reliability; Reliability Qualifications and Validation (Testing); Supplier Selection (Supply Chain Risk Reduction); Reliability and Risk Planning; Technology Readiness; Subsea Project Risk & Reliability Lifecycle; Technical Risk Assurance Process; Hardware Fault Tolerance; Risk Reduction Readiness Levels; Reliability Capability Maturity Model; Reliability of Shutdown Systems; Requirements management, Change & Configuration Control; Production Control & Shutdown Designs.

Module Delivery

This module is available for both full time and part time (online distance learning) delivery.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	50	32
Non-Contact Hours	100	118
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	1, 5, 6
Description:	Component 1 is coursework and will involve preparation of a short report and may also require use of appropriate technical applications software.				

Component 2

Type:	Examination	Weighting:	50%	Outcomes Assessed:	2, 3, 4
Description:	Component 2 is a closed book examination.				

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

In order to pass, students should achieve a mark of at least 40% in each component (which has a weighting of 30% or more) and an overall grade D or greater.

Module Grade	Minimum Requirements to achieve Module Grade:
A	Greater than or equal to 70%
B	In the range 60% to 69%
C	In the range 55% to 59%
D	In the range 50% to 54%
E	In the range 40% to 49%
F	Less than 40%
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	Normally a UK honours degree, or equivalent, in Engineering or related discipline at class 2.1 or above and proficiency in English language for academic purposes (IELTS minimum score of 6.5 or equivalent).
Corequisites for module	None.
Precluded Modules	This module is not suitable for students following an MSc in Professional Studies programme unless they meet the entry qualifications stipulated in the University Regulations on admission.

INDICATIVE BIBLIOGRAPHY

- 1 DHILLON, B.S., 2006. Maintainability, Maintenance, and Reliability for Engineers. CRC Press Inc.
- 2 O'CONNOR, P. D. T., 2002. Practical Reliability Engineering. 4th ed. Wiley
- 3 SMITH, D. J., 2005. Reliability, Maintainability and Risk: Practical Methods for Engineers Including Reliability Centred Maintenance and Safety-related Systems. 7th Revised ed. Butterworth-Heinemann Ltd.
- 4 API RP 17N. 2009. Subsea Production System Reliability and Technical Risk Management
- 5 OREDA, 2009. Offshore Reliability Data Handbook. Volume 2, Subsea Equipment. SINTEF.