Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	ADVANCED RELIABILITY
Unit ID:	MREGC5103
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	030799

Description of the Unit:

Students will develop models and apply advanced skills to problems related to reliability. The unit uses a systems approach to determine potential failure modes. Topics will extend student knowledge in areas of risk and failures in plants and infrastructure whilst also considering cost effectiveness of proposed solutions. Concepts of Integrated Logistics Support are also covered. Additional topics will cover prediction and design of reliability into safety critical systems, techniques for reliability improvements, modelling of human factors, optimisation techniques and synthesis of fault trees and critical analysis.

Grade Scheme:	Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component:	No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	**6**	**7**	**8**	**9**	**10**
Introductory						
Intermediate						✔	
Advanced						

Learning Outcomes:

On successful completion of the unit the students are expected to be able to:

Knowledge:

K1. Discern between various intrinsic quantitative and qualitative reliability elements to outline a reliability case.

K2. Integrate key engineering elements within the development of a reliability business case.

K3. Predict key reliability requirements for the development of reliability business cases.

Skills:

S1. Plan for reliability within various industrial and infrastructure contexts.

S2. Critically analyse various reliability improvement options.

S3. Interpret reliability of products.

Application of knowledge and skills:

A1. Apply reliability concepts through availability and testing problems to achieve a mission profile.

A2. Calculate reliability through the use of appropriate techniques.

Unit Content:

This unit covers systematic analysis of systems and subsystems to determine potential failure modes, the consequences of those failures and likelihood of failures in plants and infrastructure for reliability improvements.

Topics may include:
- Advanced reliability – special areas of prediction and definition.
- Designing reliability into safety critical systems.
- Practical techniques for reliability improvement.
- Synthesis of fault trees and criticality analysis.
- Human factor of reliability modelling.
- Reliability optimisation techniques.
- Knowledge engineering in reliability.

Learning Task and Assessment:

This 15 CP online unit at postgraduate level requires a minimum time commitment of 150

hours of study. Assessments need to be submitted online in assessment submission area allocated for each assessment.

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K3, S1, S2, S3, A1, A2	Analysis of reliability problems and report on the best possible capital investment decision.	Analysis and report	10% - 40%
K1, K2, K3, S1, S2, S3, A1, A2	Development and analysis of solutions using reliability optimisation techniques and report on improving performance.	Analysis and report	10% - 40%
K1, K2, K3, S1, S2, S3, A1, A2	Examination(s) and/or online test(s)	Examination(s) and/or online test(s)	60% - 40%

Adopted Reference Style:

Other (IEEE)

Refer to the library website for more information

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