



Course Outline (Higher Education)

School:	School of Engineering, Information Technology and Physical Sciences
Course Title:	ADVANCED RELIABILITY
Course ID:	MREGC5103
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	030799

Description of the Course:

Students will develop models and apply advanced skills to problems related to reliability. The course 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)

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10

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	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

On successful completion of the course 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.

Course Content:

This course 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.

Values:

- V1.** Be confident with deeper quantitative and interdisciplinary understanding of reliability throughout asset's life cycle.
- V2.** Be able to acquire and sustain organizational reliability based performance goals.

Graduate Attributes

The Federation University FedUni graduate attributes (GA) are entrenched in the [Higher Education Graduate Attributes Policy](#) (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1, K2, K3, S1, S2, S3, A1, A2	AT1,AT2
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	K1, K2, K3, S1, S2, S3, A1, A2,	AT2
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	K1, K2, K3, S1, S2, S3, A1, A2,	AT1,AT2
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1, K2, K3, K4 S1, S2, S3, S4 A1, A2, A3	AT1,AT2
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	K1, K2, K3, S1, S2, S3, A1, A2	AT2

Learning Task and Assessment:

This 15 CP online course 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	Learning 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

Fed Cite - [referencing tool](#)