Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: Reliability Applications

Unit ID: MREGC5104

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED: 030799

Description of the Unit:

This unit looks at reliability within an industrial setting focusing on physical and infrastructure assets. It is a project based unit covering the application of several reliability tools and techniques such as the Markov process, failure modes, Effects and Criticality Analysis, reliability data analysis, accelerated testing and fault tolerant systems. This unit may also cover the latest or emerging tools and techniques used in industry.

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

Work Experience:

No work experience

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						

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

Learning Outcomes:

Knowledge:

K1. Investigate and solve a wide variety of opportunities for improvements in industrial plants and infrastructure.

K2. Identify and define appropriate tools and technologies for the analysis of reliability engineering problems.

K3. Review alternative options and recommend reliability engineering solutions for physical assets in a range of industries and infrastructure settings.

Skills:

S1. Compare and contrast reliability, availability, maintainability problems to formulate solutions using appropriate tools and techniques for plant, equipment and infrastructure.

S2. Synthesize and model options for reducing downtimes, enhancing reliability, availability, maintainability and/or safety.

S3. Create strategies to evaluate impacts on costs, risks and performances through applying reliability engineering solutions.

Application of knowledge and skills:

A1. Develop solutions and justify best possible option by applying appropriate reliability engineering tools and techniques.

A2. Utilisation of reliability tools and techniques to create solutions to succinctly convey findings to reliability engineering end users.

Unit Content:

This unit covers the application of reliability engineering tools and techniques to a work-based topic and the introduction of some new tools and techniques.
Introduction to Markov Processes.
Failure Mode and Effects Analysis (FMEA).
Reliability Data Analysis.
Accelerated Testing.
Fault Tolerant Systems.
Structuring and writing of an industry problem based research project report.

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly*

assessed in each Course.

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	**Assessment task (AT#)**
FEDTASK 1 Interpersonal	Students will demonstrate high-level skills to effectively communicate, interact and work with others both individually and in groups Students will be required to display (in person and/or online) high-level skills in-person and/or online in: • Effective verbal and non-verbal communication via a range of synchronous and asynchronous methods • Active listening for meaning and influencing • High-level empathy for others • Negotiating and demonstrating extended conflict resolution skills • Working respectfully in cross-cultural and diverse teams	Not applicable	Not applicable
FEDTASK 2 Leadership	Students will demonstrate the ability to apply leadership skills and behaviours Students will be required to display skills in: • Creating, contributing to, and enabling collegial environments • Showing self-awareness and the ability to self-reflect for personal growth • Inspiring and enabling others • Making informed and evidence-based decisions through consultation with others • Displaying initiative and ability to solve problems	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complex and ambiguous environments, using their imagination to create new ideas Students will be required to display skills in: • Reflecting critically on complex problems • Synthesising, evaluating ideas, concepts and information • Proposing alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts through deep inquiry • Proposing creative solutions in problem solving	Not applicable	Not applicable
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work proficiently across a range of tools, platforms and applications to achieve a range of tasks Students will be required to display high-level skills in: • Finding, accessing, collating, evaluating, managing, curating, organising and appropriately and securely sharing complex digital information at a high-level • Receiving and responding to messages in a range of digital media • Using digital tools appropriately to conduct research • Contributing proficiently to digital teams and working groups • Participating in and utilising digital learning opportunities	Not applicable	Not applicable

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to think ethically and sustainably. Students will be required to display skills in: • The responsible conduct of research • Making informed judgments that consider the impact of devising solutions in multiple global economic environmental and societal contexts • Demonstrating commitment to social responsibility as a professional and a citizen • Generating research solutions which are sustainable,ethical, socially responsible and/or sustainable • Extending lifelong, life-wide and life-deep learning to be open to diverse others • Demonstrate extended actions to foster sustainability in their professional and personal life.	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K3, S1, S2, S3, A1, A2	Analysis and report with project scoping for solving reliability problems.	Analysis and report	10% - 20%
K1, K2, K3, S1, S2, S3, A1, A2	Analysis of tools and techniques in reliability and report on industrial applications.	Analysis and report	20% - 30%
K1, K2, K3, S1, S2, S3, A1, A2	Analysis and report from research on reliability problems and applications of solutions.	Analysis and report	40% -70%

Adopted Reference Style:

Other (IEEE)

Refer to the library website for more information

Fed Cite - referencing tool