Course Outline (Higher Education)

School: School of Engineering, Information Technology and Physical Sciences

Course Title: TEROTECHNOLOGY AND LIFE CYCLE COSTS

Course ID: MREGC5001

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): (ENMTX4050)

ASCED: 030799

Description of the Course :

This course will introduce terotechnology and capital investment decisions relevant to asset management. This course will cover the broad subject area of life cycle costs and the costs-of-ownership of assets; impact of maintenance decisions and capital investment option analysis. The course will also cover terotechnological aspects of engineering economics. Various tools and techniques will be introduced to help inform capital investment decision making, asset purchase and replacement policies and economic decisions to buy or replace major units and plants. Whole-of-life cost considerations are important in terms of their possible impact on maintainability and in the pursuit of reducing life cycle costs. This is an important foundational course for students interested in practicing good asset management, maintenance and reliability engineering.

Grade Scheme: Graded (HD, D, C, etc.)

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
Introductory					✔	

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

Learning Outcomes:

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

Knowledge:

K1. Define lifecycle cost (LCC) and apply principle to estimate the constituent components.

K2. Identify issues related to reliability, availability and maintainability and recognise impact on LCC.

K3. Select tools for appraising and ranking of capital investment options for informed decisions analysing the risk based time value of money.

Skills:

S1. Construct problems related to life cycle issues and challenges.

S2. Evaluate impact of reliability, availability and maintainability on life cycle costs.

S3. Model and solve life cycle cost and capital investment related problems.

Application of knowledge and skills:

A1. Apply techniques for the analysis of plant acquisition, operational, maintenance and disposal costs.

A2. Construct model for analysing various capital investment options.

A3. Justify capital investment decisions based on lifecycle costs.

Course Content:

This course will cover the broad subject area of life cycle costs and the costs-of-ownership of assets; impact of maintenance decisions and capital investment option analysis.

Topics may include:

- Introduction to asset management and Terotechnology.
- Asset management systems that can be used to ensure that maintenance costs and capital investments are considered throughout the life cycle of equipment.
- Improvement of maintainability and reduction of life cycle costs.
- Plant purchase techniques and capital investment analysis tools to optimise the life cycle costs of plants.
- Replacement policies, tools and techniques for risk based decisions in replacement of plants or major part of any plant or infrastructure.

Values:

V1. Be capable of taking informed decisions on capital investments based on life cycle costs.

V2. Able to perform globally in maintenance and reliability engineering roles requiring techno commercial decision making.

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)	**Code** A. Direct B. Indirect N/A Not addressed	**Assessment task (AT#)**	**Code** A. Certain B. Likely C. Possible N/A Not likely
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-K3, S1-S3, A1-A3	A	AT1-AT2	A
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-K3, S1-S3, A1-A3	A	AT1-AT2	B
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-K3, S1-S3, A1-A3	B	AT2	C
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-K3, S1-S3, A1-A3	A	AT1-AT2	A
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-K3, S1-S3, A1-A3	B	AT2	B

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, A3	Analysis and report on a problem relevant to the industry analysing the context of the lifecycle cost and capital investment.	Analysis and report.	20% - 40%
K1, K2, K3, S1, S2, S3, A1, A2, A3	Analysis and report of alternative options for the best possible capital investment decisions.	Analysis and report	20% - 40%

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, K2, K3, S1, S2, S3, A1, A2, A3	Examinations or online test	Examination or online test.	60% - 40%

Adopted Reference Style:

Other (IEEE)