

Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: Terotechnology and Life Cycle Costs

Unit ID: MREGC5001

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): (ENMTX4050)

ASCED: 030799

Description of the Unit:

This unit will introduce terotechnology and capital investment decisions relevant to asset management. This unit 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 unit 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 unit for students interested in practicing good asset management, maintenance and reliability engineering.

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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<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:

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.

Unit Content:

This unit 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.

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.

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**tttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are 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 at this level will demonstrate an advanced ability in a range of contexts to effectively communicate, interact and work with others both individually and in groups. Students will be required to display high level skills in-person and/or online in: <ul style="list-style-type: none"> Using and demonstrating a high level of verbal and non-verbal communication Demonstrating a mastery of listening for meaning and influencing via active listening Demonstrating and showing empathy for others High order skills in negotiating and conflict resolution skills Demonstrating mastery of working respectfully in cross-cultural and diverse teams. 	Not applicable	Not applicable
FEDTASK 2 Leadership	Students at this level will demonstrate a mastery in professional skills and behaviours in leading others. <ul style="list-style-type: none"> Creating and sustaining a collegial environment Demonstrating a high level of self-awareness and the ability to self-reflect and justify decisions Inspiring and initiating opportunities to lead others Making informed professional decisions Demonstrating initiative in new professional situations. 	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students at this level will demonstrate high level skills in working in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: <ul style="list-style-type: none"> Reflecting critically to generate and consider complex ideas and concepts at an abstract level Analysing complex and abstract ideas, concepts and information Communicate alternative perspectives to justify complex ideas Demonstrate a mastery of challenging conventional thinking to clarify complex concepts Forming creative solutions in problem solving to new situations for further learning. 	Not applicable	Not applicable
FEDTASK 4 Digital Literacy	Students at this level will demonstrate the ability to work competently across a wide range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: <ul style="list-style-type: none"> Mastering, exploring, evaluating, managing, curating, organising and sharing digital information professionally Collating, managing complex data, accessing and using digital data securely Receiving and responding professionally to messages in a range of professional digital media Contributing competently and professionally to digital teams and working groups Participating at a high level in digital learning opportunities. 	Not applicable	Not applicable
FEDTASK 5 sustainable and Ethical Mindset	Students at this level will demonstrate a mastery of considering and assessing the consequences and impact of ideas and actions in enacting professional ethical and sustainable decisions. Students will be required to display skills in: <ul style="list-style-type: none"> Demonstrate informed judgment making that considers the impact of devising complex solutions in ambiguous global economic environmental and societal contexts Professionally committing to the promulgation of social responsibility Demonstrate the ability to evaluate ethical, socially responsible and/or sustainable challenges and generating and articulating responses Communicating lifelong, life-wide and life-deep learning to be open to the diverse professional others Generating, leading and implementing required 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, 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%
K1, K2, K3, S1, S2, S3, A1, A2, A3	Examinations or online test	Examination or online test.	60% - 40%

Adopted Reference Style:

Other (IEEE)

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)