

Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	Industrial Techniques in Maintenance Management
Unit ID:	MREGC5003
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	039999

Description of the Unit:

This unit is on industrial techniques useful for maintenance and reliability engineering problem solving. Topics include work measurement, method study and activity sampling applied to maintenance activities. Topics extend to personnel time management, stock control of materials and parts within the maintenance function, stores layout, establishing inventories, and stock levels and re-order levels. Project management techniques are integrated into the unit to show how they can be applied to shutdowns and major maintenance project activities including critical path analysis of networks and analysis of schedules for time requirements using Gantt charts and project evaluation and review technique. Motivation and control of the workforce covering leadership and management in maintenance are also covered. This is an important unit for students interested in practicing good asset management, maintenance and reliability engineering.

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	■	■	■	■	■	■
Intermediate	■	■	■	■	✓	■
Advanced	■	■	■	■	■	■

Learning Outcomes:

Knowledge:

- K1.** Identify opportunities for improvement using industrial engineering tools and techniques for utilisation of resources including human resources relevant to maintenance activities.
- K2.** Select network analysis tools and estimate times and conduct resource levelling for planning of inspection and shutdown maintenance projects.
- K3.** Recognise factors involved in purchase, supply and stock management for predicting required stock level, ordering time and order quantity of spare parts and maintenance materials.

Skills:

- S1.** Apply industrial engineering tools including activity sampling in maintenance activities and analysing utilisation of resources.
- S2.** Identify and apply tools for scheduling covering network analysis, Gantt charts and resource levelling.
- S3.** Modelling and analysis of spare part requirements and stock control in plant maintenance and outage plan.

Application of knowledge and skills:

- A1.** Assess resource utilisation and justify improvement options in maintenance departments.
- A2.** Construct Network for maintenance schedule and estimate critical path including benefits of resource levelling.
- A3.** Formulate inventory strategy for cost effective stock control of spares and maintenance materials.

Unit Content:

This unit covers industrial engineering tools, stock control and project management techniques applied to shutdowns and major maintenance project activities.

Topics may include:

1. Industrial engineering techniques.
2. Stock control and spare parts management.
3. CPM Network analysis.
4. Network analysis and PERT techniques.
5. Outage management.
6. Leadership in maintenance and asset management.

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: • 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. • 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: • 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: • 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 attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
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, K3, S1, S3, A1, A3	Analysis and report on utilisation of resources.	Analysis and report	10% - 30%
K1, K2, S1, S2, A1, A2	Analysis and reports on scheduling maintenance projects.	Analysis and report.	20% - 40%
K1, K2, K3, S1, S2, S3, A1, A2, A3	Examination/ online test.	Examination/ online test	40% - 60%

Adopted Reference Style:

Other (IEEE)

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

Fed Cite - [referencing tool](#)