



ENEM13012 Maintenance Engineering

Term 2 - 2020

Profile information current as at 29/04/2024 08:37 am

All details in this unit profile for ENEM13012 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

This unit outlines the importance of effective maintenance management in industry, the costs of maintenance and the benefits of effective maintenance planning and strategies. Emphasis is placed on practical aspects of managing maintenance for plant and equipment. You are introduced to techniques and methods for monitoring the condition of plant and equipment, and to processes used to implement and manage condition monitoring. You will investigate maintenance problems and prepare plans to solve such problems. The unit outlines methods for assessing maintenance effectiveness and improving maintenance systems, and provides a vehicle for developing skills for working and learning autonomously to solve problems, to document approaches used to solve problems and to communicate professionally.

Details

Career Level: *Undergraduate*

Unit Level: *Level 3*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Pre-requisites: ENEG12004 Engineering Design & Management Planning OR ENEG12007 Design and Project Management

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 2 - 2020

- Bundaberg
- Cairns
- Gladstone
- Mackay
- Online
- Rockhampton

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**

Weighting: 15%

2. **Written Assessment**

Weighting: 25%

3. **Presentation and Written Assessment**

Weighting: 60%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Email, telephone conversations and 'Have Your Say'

Feedback

Cohort members were very happy with the range of information, detail, and advice provided on theoretical matters relating to maintenance issues.

Recommendation

Continue to provide a broad range of information, detail, and advice regarding theoretical matters relating to maintenance issues.

Feedback from Email, telephone conversations and 'Have Your Say'

Feedback

Cohort members believe the focus on an authentic engineering scenario (whether industry-based or of their own design) is important in exploring and applying the theoretical aspects relating to identifying, describing, and seeking to remedy a maintenance issue.

Recommendation

Continue to provide an assessment approach that focuses on an authentic engineering scenario (whether industry-based or of their own design) to explore and apply theoretical aspects relating to identifying, describing, and seeking to remedy a maintenance issue.

Feedback from 'Have your Say'

Feedback

Identified there is a low rate of response from the cohort though 'Have your Say.'

Recommendation

Continue to encourage students to give feedback, as previous feedback has been taken up and the unit changed accordingly.

Feedback from Feedback

Feedback

Assessment Requirements: Produce further information for students to access assessment requirements.

Recommendation

Provide further information to students on Moodle site with regards to assessment requirements.

Feedback from Unit Coordinator observation

Feedback

The Unit Coordinator has observed students find the Assessment Criteria Sheet Rubric provided for each assessment too generic.

Recommendation

Update of rubric.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Explain the impact of maintenance on the business of industrial organisations and the need for maintenance management.
2. Describe processes for establishing maintenance needs of engineering operations, and developing maintenance plans and strategies, and explain costs and benefits of maintenance management.
3. Describe techniques and methods for monitoring the condition of plant and equipment.
4. Describe processes used to implement and manage condition monitoring programs for specific applications of plant and equipment.
5. Investigate and analyse maintenance problems and develop plans to solve these problems.
6. Describe methods for assessing maintenance effectiveness and methods for improving maintenance systems and control of maintenance.
7. Work and learn autonomously to solve problems and record and communicate clearly and professionally the approaches used to solve problems and the rationale for adopting such approaches to problems.

Learning outcomes are linked to Engineers Australia Stage 1 Competencies and discipline capabilities.

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Written Assessment - 15%	•	•	•	•			•
2 - Written Assessment - 25%	•	•	•	•	•	•	•
3 - Presentation and Written Assessment - 60%	•	•	•	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Communication	•	•	•	•	•	•	•
2 - Problem Solving	•	•	•	•	•	•	•
3 - Critical Thinking							
4 - Information Literacy	•	•	•	•	•	•	•
5 - Team Work							
6 - Information Technology Competence							
7 - Cross Cultural Competence							

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
8 - Ethical practice	•	•	•	•	•	•	•
9 - Social Innovation							
10 - Aboriginal and Torres Strait Islander Cultures							

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Written Assessment - 15%	•	•	•	•				•		
2 - Written Assessment - 25%	•	•	•	•				•		
3 - Presentation and Written Assessment - 60%	•	•	•	•				•		

Textbooks and Resources

Textbooks

There are no required textbooks.

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Online Study Guide Available on Unit Moodle website
- Zoom Lecture and Tutorial Sessions

Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)
For further information, see the Assessment Tasks.

Teaching Contacts

Subhash Sharma Unit Coordinator

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Benjamin Taylor Unit Coordinator

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Schedule

Week 1 - 13 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Module 1: Introduction to Maintenance and Appendix 1: Terminology	Module 1: Study guide in unit Moodle website	Assessment 1 Task Part A: Project Topic Verification: prior to Friday of Week 1 Zoom lecture sessions

Week 2 - 20 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Module 1: Introduction to Maintenance	Module 1: Study guide (Access on Moodle Site)	Assessment 1 Task Part A: written verification of acceptance prior to the Monday of Week 2 from your lecturer. Zoom lecture sessions. Check regular announcement on unit Moodle website.

Week 3 - 27 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Module 2: Principles of Management	Module 2: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.

Week 4 - 03 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Module 2: Principles of Management	Module 2: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.

Week 5 - 10 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Module 2: Principles of Management	Module 2: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website. Assessment Task 1 Due: Week 5 Friday (14 Aug 2020) 11:30 pm AEST

Vacation Week - 17 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
VACATION		NO TEACHING THIS WEEK

Week 6 - 24 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Module 3: Financial Analysis and Maintenance Management	Module 3: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.

Week 7 - 31 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic

Module 3: Financial Analysis and Maintenance Management	Module 3: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.
Week 8 - 07 Sep 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Module 4: Maintenance Management Techniques (1)	Module 4: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.
Week 9 - 14 Sep 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Module 4: Maintenance Management Techniques (1)	Module 4: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.
Week 10 - 21 Sep 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Appendix 2: Mathematics Supplement and Appendix 3: Weibull Analysis	Appendix 2 and 3 : Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.
Week 11 - 28 Sep 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Module 5: Maintenance Management Techniques (2)	Module 5: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.
		Assessment Task 2 Due: Week 11 Friday (2 Oct 2020) 11:30 pm AEST
Week 12 - 05 Oct 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Module 5: Maintenance Management Techniques (2)	Module 5: Study guide (Access on Moodle Site)	Zoom lecture sessions. Check regular announcement on unit Moodle website.
Review/Exam Week - 12 Oct 2020		
Module/Topic	Chapter	Events and Submissions/Topic
		Assessment Task 3 Due: Review/Exam Week Monday (12 Oct 2020) 11:30 pm AEST
Exam Week - 19 Oct 2020		
Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Assessment Task 1

Assessment Type

Written Assessment

Task Description

Refer to the Moodle site for **complete details** of the assessment items. This is only a basic outline of the features relating to the assessment task. This assessment has two parts.

Part A:

Project Tropic Verification - Identification of an appropriate Maintenance Problem currently exists in your organisation.

Prior to Friday of Week 1 you need to discuss and submit the 'Identification of Maintenance Problem: Proposal Form" to your lecturer's CQU email address and then receive **written verification** of acceptance **prior** to the Monday of Week 2 from your lecturer regarding the appropriateness and viability of your chosen organisation and the identified maintenance problem as a focus for all assessment tasks in this unit.

Part B:

Outline Organisational Description including Organisational Structure existing in the organisation and Define Maintenance Problem

The aim of Assessment 1 is to select **one** problem or opportunity within the maintenance function within your chosen organisation that could be solved using basic concepts of maintenance, management theories, maintenance principle and maintenance management techniques and principles presented in your Study Guide.

Remember your study approach should not be limited to unit Study Guide only. You are encouraged to study and investigate further beyond the unit materials.

You will need to complete and submit through the Assessment submission link in the unit Moodle website, an appropriately referenced, written investigative report, including appropriate descriptions, analysis, documentation with appropriate figures, charts and tables support relevant to your assessment task.

Study Module 1 and Module 2 in your Unit Study Guide should be supportive to complete your Assessment 1.

Assessment Due Date

Week 5 Friday (14 Aug 2020) 11:30 pm AEST

Please submit only Microsoft Word document No PDF file Submission will be accepted for any task

Return Date to Students

Week 6 Friday (28 Aug 2020)

Expected return 2 weeks after submission due date.

Weighting

15%

Minimum mark or grade

50% of the weighting

Assessment Criteria

Refer to the Moodle site for complete details of the Assessment Criteria sheet for Assessment 1. This is only a basic outline of the features relating to the assessment task. Each submission will be assessed for presentation and layout, correct procedure, analysis and accuracy and appropriate referencing. The major assessment criteria relate to Analysis & Interpretation, Communication and Information Literacy. Please read carefully the details outlined in the Assessment 1 Assessment Criteria sheet **before** commencing the assessment item.

As you undertake the Assessment 1 ensure you address all assessment criteria outlined.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Submission Instructions

Check in the Moodle for appropriate file name protocol for different files.

Learning Outcomes Assessed

- Explain the impact of maintenance on the business of industrial organisations and the need for maintenance management.
- Describe processes for establishing maintenance needs of engineering operations, and developing maintenance plans and strategies, and explain costs and benefits of maintenance management.
- Describe techniques and methods for monitoring the condition of plant and equipment.
- Describe processes used to implement and manage condition monitoring programs for specific applications of plant and equipment.
- Work and learn autonomously to solve problems and record and communicate clearly and professionally the approaches used to solve problems and the rationale for adopting such approaches to problems.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Ethical practice

2 Assessment Task 2

Assessment Type

Written Assessment

Task Description

Develop an investigative report on the Maintenance Problem you have chosen as a project in your Assessment 1. This report should cover In-depth problem Analysis, conduct relevant literature review and develop solutions as strategies to solve the maintenance problem.

Refer to the Moodle site for **complete details** of the assessment item. This is only a basic outline of the features relating to the Assessment 2.

The aim of Assessment Task 2 is to discuss in detail upon your chosen maintenance problem, defined in Assessment 1, and to provide detailed insights into the technique you will adopt to address this problem. Your solution needs to focus upon using concept of maintenance, theories of management, maintenance management techniques and principles presented in Unit Study Guide available in the unit Moodle website.

You need to Study Module 3, Module 4 and Module 5 in your Unit Study Guide. As you have already studied Module 1 and Module 2 to define your project for Assessment 1, it should be supportive in your report writing for this Assessment. should be supportive to complete your Assessment 1.

Remember your study approach should not be limited to unit Study Guide only. You are encouraged to study and investigate further beyond the unit materials.

You will need to complete and submit through the Assessment submission link in the unit Moodle website, an appropriately referenced, written investigative report, including appropriate descriptions, analysis, documentation with appropriate figures, charts and tables support relevant to your assessment task.

Assessment Due Date

Week 11 Friday (2 Oct 2020) 11:30 pm AEST

Please submit only Microsoft Word document No PDF file Submission will be accepted for any task

Return Date to Students

Assessment feedback should be available 2 weeks after submission. However grade will be available after unit moderation.

Weighting

25%

Minimum mark or grade

50% of the weighting

Assessment Criteria

Refer to the Moodle site for complete details of the Assessment Criteria sheet for Assessment 2. This is only a basic outline of the features relating to the assessment task. Each submission will be assessed for presentation and layout, correct procedure, analysis and accuracy and appropriate referencing. The major assessment criteria relate to Analysis & Interpretation, Communication and Information Literacy. Please read carefully the details outlined in the Assessment 2 Assessment Criteria sheet **before** commencing the assessment item.

As you undertake the Assessment 2 ensure you address all assessment criteria outlined.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Submission Instructions

Check in the Moodle for appropriate file name protocol for different files. No PDF file Submission for any task

Learning Outcomes Assessed

- Explain the impact of maintenance on the business of industrial organisations and the need for maintenance management.
- Describe processes for establishing maintenance needs of engineering operations, and developing maintenance plans and strategies, and explain costs and benefits of maintenance management.
- Describe techniques and methods for monitoring the condition of plant and equipment.
- Describe processes used to implement and manage condition monitoring programs for specific applications of plant and equipment.
- Investigate and analyse maintenance problems and develop plans to solve these problems.
- Describe methods for assessing maintenance effectiveness and methods for improving maintenance systems and control of maintenance.
- Work and learn autonomously to solve problems and record and communicate clearly and professionally the approaches used to solve problems and the rationale for adopting such approaches to problems.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Ethical practice

3 Assessment Task 3

Assessment Type

Presentation and Written Assessment

Task Description

To complete Assessment 3 you will develop and submit two items based on the report you submit in Assessment 2:

Your Video Presentation file for the project

And your Power Point Presentation Slides

Refer to the Moodle site for **complete details** of the Assessment 3. This is only a basic outline of the features relating to the assessment task. You must provide detailed and appropriately referenced descriptions, diagrams, discussions and analysis in order to demonstrate your knowledge and understanding of concepts and processes.

The aim of Assessment 3 is to present complete solution for your project undertaken, in a cohesive and holistic form. In investigating, analysing and finding an appropriate solution to the maintenance problem you have chosen in Assessment

1, you need to use maintenance management techniques, theories, principles and modelling extensively (e.g. Financial Analysis/Modeling, Life Cycle Management and Cost Modeling, Work Study, Queuing Theory, Statistical Failure Analysis, Reliability/RAMS Modeling FMECA, Planned Maintenance Optimisation, Pareto Analysis, Control Charts, etc.).

Assessment Due Date

Review/Exam Week Monday (12 Oct 2020) 11:30 pm AEST

Please submit only Microsoft Word document No PDF file Submission will be accepted for any task

Return Date to Students

Assessment feedback and final grade will be available after unit moderation.

Weighting

60%

Minimum mark or grade

50% of the weighting

Assessment Criteria

Refer to the Moodle site for complete details of the Assessment Criteria sheet for Assessment 3. This is only a basic outline of the features relating to the assessment task. Each submission will be assessed for presentation and layout, correct procedure, analysis and accuracy and appropriate referencing. The major assessment criteria relate to Analysis & Interpretation, Communication and Information Literacy. Please read carefully the details outlined in the Assessment 3 Assessment Criteria sheet **before** commencing the assessment item.

As you undertake the Assessment 3 ensure you address all assessment criteria outlined.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Submission Instructions

Check in the Moodle for appropriate file name protocol for different files.

Learning Outcomes Assessed

- Explain the impact of maintenance on the business of industrial organisations and the need for maintenance management.
- Describe processes for establishing maintenance needs of engineering operations, and developing maintenance plans and strategies, and explain costs and benefits of maintenance management.
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Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Ethical practice

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem