ENMM20031 *Condition Monitoring and Tribology*
Term 1 - 2026

Profile information current as at 08/09/2026 03:48 am

All details in this unit profile for ENMM20031 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 course is centred around studying tribological principles, which provide a foundation for understanding a machine's friction, wear, and lubrication characteristics. By acquiring knowledge in tribology, you will be equipped to identify the root causes of failures and utilize appropriate condition-monitoring techniques to predict and minimize future failures. The course will provide you with the necessary knowledge and skills to implement condition monitoring as a maintenance strategy. With exposure to a diverse range of techniques, including sensory and functional inspections, vibration monitoring, infrared thermography, oil analysis, stress and strain analysis, non-destructive testing and inspection, electrical equipment, and general performance monitoring, you will be well-equipped to select the most suitable condition monitoring technique for any given scenario.

Details
Career Level: *Postgraduate*
Unit Level: *Level 8*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites
Prerequisites: ENMM20023 & ENMM20025
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 1 - 2026
- Online

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 Postgraduate 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 - Oil analysis and tribology (Written Assessment)
Weighting: 30%
2. Written Assessment 2 - Vibration Analysis (Written Assessment)
Weighting: 30%
3. Mini-project and Presentation (Presentation and Written Assessment)
Weighting: 40%

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
- Academic Progression Policy and Procedure
- Student Refund and Credit Balance Policy and Procedure
- 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 Student feedback

Feedback
The unit effectively integrates industry knowledge and practical insights that enhance student learning.

Recommendation
Quality of unit content and delivery will be maintained through continued use of industry-informed learning materials and examples.

Feedback from Student feedback

Feedback
The unit is highly relevant to professional practice in Asset and Maintenance Management.

Recommendation
Continued efforts will be made to ensure the unit remains aligned with current industry needs and expectations.

Feedback from Student feedback

Feedback
Assessment submission days were inconsistent, which caused some confusion for students.

Recommendation
Assessment submission dates and days will be reviewed to improve consistency and clarity for students.

Unit Learning Outcomes

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

1. Apply tribological principles for deciding condition monitoring techniques
2. Identify the range of condition monitoring techniques suitable in a plant
3. Investigate the standards associated with condition monitoring techniques
4. Justify the use of condition monitoring in a plant.

n/a

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level • Introductory Level • Intermediate Level • Graduate Level ◦ Professional Level ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 30%	•	•	•	•
2 - Written Assessment - 30%	•	•	•	•
3 - Presentation and Written Assessment - 40%			•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Knowledge	◦	◦	◦	◦
2 - Communication	◦	◦	◦	◦
3 - Cognitive, technical and creative skills	◦	◦	◦	◦
4 - Research	◦	◦	◦	◦
5 - Self-management	◦		◦	
6 - Ethical and Professional Responsibility	◦	◦	◦	◦
7 - Leadership		◦	◦	◦
8 - First Nations Knowledges				
9 - Aboriginal and Torres Strait Islander Cultures				◦

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)
- Zoom online Lecture Sessions
- Weblinks to different resources

Referencing Style

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

Teaching Contacts

Peter Horsburgh Unit Coordinator
p.horsburgh@cqu.edu.au
Muralitheran V Kanagarajoo Unit Coordinator
m.kanagarajoo@cqu.edu.au

Schedule

Week 1 -Introduction to Condition Monitoring - 09 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Condition Monitoring & Tribology	Self-study Articles and Study- guide Module 1	Introduce yourself to the class via a Discussion Forum. Discussion on assessment requirements.

Week 2 - 16 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
Tribology- Friction Wear and Lubrication	Self-study Chapter 2 of Oil Analysis and Condition Monitoring book by David Whitby and Lecture notes by the lecturer.	Tutorial 1: Quiz on Tribology and Condition Monitoring

Week 3 - 23 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic
Oil Analysis and ASTM standards	Self-study articles were provided and Chapter 6 of the Oil Analysis and Condition Monitoring book by David Whitby.	Tutorial 2: Discussion on Cheveron_ Testing Used Engine Oils

Week 4- Oil Cleanliness and ASTM standards - 30 Mar 2026

Module/Topic	Chapter	Events and Submissions/Topic

Oil Cleanliness	Self-study Lecturer's notes and Chapter 10 of the Oil Analysis and Condition Monitoring book by David Whitby.	Tutorial 3: Discussion on Video on Oil cleanliness This week Tuesday 31 March 2026 is the Census Date, after this day you cannot drop this unit. Daylight saving ends on Sunday 5 April 2026 this week, please check the online lecture time.

Week 5 - Theory of Vibration - 06 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
Theory of Vibration	Self-study Comset Vibration guide	Tutorial 4: Questions related to Vibration measurements Overview of Assessment 2

Week 6- - 13 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
Theory of Vibration	Lecture notes Module 3 of the study guide	Guest Lecture by an industry expert. Tutorial 5: Question-answer session Written Assessment - Oil analysis and tribology Due: Week 6 Monday (13 Apr 2026) 11:59 pm AEST

Vacation Week - NO TEACHING - 20 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic

Week 7 - 27 Apr 2026

Module/Topic	Chapter	Events and Submissions/Topic
Vibration Analysis	Self-study Chapter 3 of Study-guide	Tutorial 6: Discussion on a video on vibration analysis

Week 8- Vibration Standards - 04 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
Revision of the vibration Analysis	Module 4 of the study guide	Tutorial 7: Discussion on Assessment 2

Week 9- Non destructive testing - 11 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
Parameter Limits	Module 2 of the Study Guide	Tutorial 8: Discussion on Use of Parameters and Warning Limits Discussion on Assessment 3 Written Assessment 2 - Vibration Analysis Due: Week 9 Monday (11 May 2026) 11:59 pm AEST

Week 10- - 18 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
Non Destructive Testing	Self-study using Internet	Tutorial 9- discussion on a video on new condition monitoring tools

Week 11- - 25 May 2026

Module/Topic	Chapter	Events and Submissions/Topic
Application of the Internet of Things	Lecture notes provided by the guest speaker	Tutorial 10: Discussion on the mini-project assessment Instructions on PowerPoint presentation slides

Week 12- REVISION - 01 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic
Revision of the unit	All Chapters	Discussion on Mini-project requirements.

Exam Week - 08 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic
		Mini-project and Presentation Due: Exam Week Monday (8 June 2026) 11:59 pm AEST

Vacation/Exam Week - 15 Jun 2026

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Written Assessment

Assessment Title
Written Assessment - Oil analysis and tribology

Task Description
The written assessment for this unit will focus on the introduction of condition monitoring principles and the fundamentals of Tribology, including friction, wear, and lubrication, and their application to used oil analysis in a given shop floor scenario. Students need to have a strong understanding of ASTM standards for used oil testing. The assessment will cover materials from the topics covered in weeks 1-4. The assessment details, including the question sheet, will be available on the Moodle website for this unit. The assignment will require you to gather information from industry reports or interviews and demonstrate your knowledge of oil analysis practices in industries and your understanding of tribology principles as applied in machines. In addition to the learning guide, you will need to use additional resources such as company reports, information from websites, and library resources to complete the assessment.
AI Assessment Scale - Student Instruction
AI PLANNING
You may use AI for planning, idea development, and research. Your final submission should show how you have developed and refined these ideas.
Guidelines
AI may be used for pre-task activities such as brainstorming, outlining and initial research. You may use AI-assisted automatic speech recognition to transcribe notes, AI tools to convert notes into outlines, and AI tools to brainstorm or suggest improvements to already created work. Image generation technologies might be used to generate starting points for designs or tools used to explore possibilities for producing software. You must then use the AI-generated ideas as the starting point and apply your skills and knowledge to refine and improve the initial ideas to the final submission. No GenAI-created content without changes should be included in the final submissions. You need to briefly describe how AI tools were used during the planning, research and initial idea-generation stage of the assessment.
You must specify which questions of the assessment where AI help was included.
Example (provide the following details on each assessment submission document - after the Cover page, before Table of Content):
Assessment 1 Question 3 - I used AI to develop a structure for .....

Assessment Due Date
Week 6 Monday (13 Apr 2026) 11:59 pm AEST
No Assessment Due Date

Return Date to Students
Week 8 Monday (4 May 2026)
No Return Date to Students

Weighting
30%

Assessment Criteria
The evaluation criteria for this assignment focus on providing a clear explanation of the problem and achieving excellence in the content. The quality of your content will influence your marks. Ensure clarity of expression throughout by utilizing illustrations and tables, which are visual aids to limit the word count. Your answers should be contextualised to your workplace practices. The assessment will cover materials from the topics covered in weeks 5-8. For additional information, including the grading criteria, assignment questions, and the grading method for each question, please refer to the marking rubric on the Moodle website for this unit.

Referencing Style
Harvard (author-date)

Submission
Online

Submission Instructions
Submit your assignment electronically in "MSWord" format NOT pdf, Ensure filename is formatted as (example): John Smith_S000111_ENMM20031_Assignment_1.doc

Learning Outcomes Assessed
- Apply tribological principles for deciding condition monitoring techniques
- Identify the range of condition monitoring techniques suitable in a plant
- Investigate the standards associated with condition monitoring techniques
- Justify the use of condition monitoring in a plant.

2 Written Assessment

Assessment Title
Written Assessment 2 - Vibration Analysis

Task Description
Assessment deals with the basic principles of vibration monitoring, vibration data collection, and its analysis. Assignment questions will be posted on the Moodle Web page of this unit. Questions may require theoretical answers or based on the data that you collect from your workplace. Students are expected to research resources listed on the Moodle web page, interviews, and company reports. In addition to the learning guide, you will need to use additional resources such as company reports/CMMS, information from websites, and library resources to complete the assignment.
AI Assessment Scale - Student Instruction
AI PLANNING
You may use AI for planning, idea development, and research. Your final submission should show how you have developed and refined these ideas.
Guidelines
AI may be used for pre-task activities such as brainstorming, outlining and initial research. You may use AI-assisted automatic speech recognition to transcribe notes, AI tools to convert notes into outlines, and AI tools to brainstorm or suggest improvements to already created work. Image generation technologies might be used to generate starting points for designs or tools used to explore possibilities for producing software. You must then use the AI-generated ideas as the starting point and apply your skills and knowledge to refine and improve the initial ideas to the final submission. No GenAI-created content without changes should be included in the final submissions. You need to briefly describe how AI tools were used during the planning, research and initial idea-generation stage of the assessment.
You must specify which questions of the assessment where AI help was included.
Example (provide the following details on each assessment submission document - after the Cover page, before Table of Content):
Assessment 2 Question 1 - I used AI to develop a structure for .....

Assessment Due Date
Week 9 Monday (11 May 2026) 11:59 pm AEST
No Assessment Due Date

Return Date to Students
Week 11 Monday (25 May 2026)
No Return Date to Students

Weighting
30%

Assessment Criteria
The evaluation criteria for this assessment focus on providing a clear explanation of the problem and achieving excellence in the content. The quality of your content will influence your marks. Ensure clarity of expression throughout by using illustrations and tables as visual aids to limit the word count. For additional information, including the grading criteria, assessment questions, and the grading method for each question, please refer to the marking rubric on the Moodle website for this unit.

Referencing Style
Harvard (author-date)

Submission
Online

Submission Instructions
Submit your assignment electronically in "MSWord" format NOT pdf, Ensure filename is formatted as (example): John Smith_S000111_ENMM20031_Assignment_2.doc

Learning Outcomes Assessed
- Apply tribological principles for deciding condition monitoring techniques
- Identify the range of condition monitoring techniques suitable in a plant
- Investigate the standards associated with condition monitoring techniques
- Justify the use of condition monitoring in a plant.

3 Presentation and Written Assessment

Assessment Title
Mini-project and Presentation

Task Description
This assessment is a mini-project report that requires you to develop a condition monitoring plan. The plan can be used to implement a new CM system or upgrade the existing one by incorporating new condition-monitoring technologies in your workplace. This may involve collecting data from your company's CMMS and interviewing stakeholders, consulting journals, websites, etc. If data is confidential, you may need to adjust it logically to maintain the confidentiality of the source; however, CQU takes no responsibility for the confidentiality of the data. To minimize the word count, utilize tables, charts, and diagrams as much as possible. The presentation should consist of no more than 10 PowerPoint slides, focusing on solving problems using advanced condition monitoring tools, including non-destructive technologies. The assignment will cover materials from the entire unit, specifically from weeks 9-10. This assignment is a mini-project report that requires you to develop a condition monitoring plan that can be used to implement a new CM system or upgrade the existing one by incorporating new condition monitoring technologies at your workplace. This may involve collecting data from your company's CMMS, interviewing stakeholders, and gathering information from CMMS, books, and websites. If the data is confidential, you may need to adjust it logically to maintain security, however, CQU takes no responsibility for the confidentiality of the data. To minimize the word count, utilize tables, charts, and diagrams as much as possible. The presentation should consist of no more than 10 PowerPoint slides, focusing on a problem related to advanced non-destructive technologies used in condition monitoring.

AI Assessment Scale - Student Instruction
AI PLANNING
You may use AI for planning, idea development, and research. Your final submission should show how you have developed and refined these ideas.
Guidelines
AI may be used for pre-task activities such as brainstorming, outlining and initial research. You may use AI-assisted automatic speech recognition to transcribe notes, AI tools to convert notes into outlines, and AI tools to brainstorm or suggest improvements to already created work. Image generation technologies might be used to generate starting points for designs or tools used to explore possibilities for producing software. You must then use the AI-generated ideas as the starting point and apply your skills and knowledge to refine and improve the initial ideas to the final submission. No GenAI-created content without changes should be included in the final submissions. You need to briefly describe how AI tools were used during the planning, research and initial idea-generation stage of the assessment.
You must specify which questions of the assessment where AI help was included.
Example (provide the following details on each assessment submission document - after the Cover page, before Table of Content):
Assessment 3 Question 2 - I used AI to develop a structure for .....

Assessment Due Date
Exam Week Monday (8 June 2026) 11:59 pm AEST
No Assessment Due Date

Return Date to Students
Results will be released on grade certification date

Weighting
40%

Assessment Criteria
The evaluation criteria for this assessment focus on providing a clear explanation of the problem and achieving excellence in the content. The quality of your content will influence your marks. Ensure clarity of expression throughout by using illustrations and tables as visual aids to limit the word count. For additional information, including the grading criteria, assessment questions, and the grading method for each question, please refer to the marking rubric on the Moodle website for this unit.

Referencing Style
Harvard (author-date)

Submission
Online

Submission Instructions
Submit your assignment electronically in "MSWord" format NOT pdf, Ensure filename is formatted as (example): John Smith_S000111_ENMM20031_Assignment_3.doc.

Learning Outcomes Assessed
- Investigate the standards associated with condition monitoring techniques
- Justify the use of condition monitoring in a plant.

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