



# ENMM20031 Condition Monitoring and Tribology

## Term 1 - 2020

Profile information current as at 01/07/2022 03:21 pm

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 unit is focused on the tribological principles to understand fundamentals of friction, wear and lubrication aspects of a machine. The knowledge of tribology will help student analysing root cause of failures and also in selecting an appropriate condition monitoring technique to predict failures. The unit will provide adequate knowledge to use condition monitoring as a maintenance strategy. Students will acquire adequate skills to select a suitable condition monitoring technique from a variety of techniques such as; sensory and function inspection; vibration monitoring; infrared thermography; oil analysis; acoustic emission; stress, strain, displacement; non-destructive testing/inspection; electrical equipment performance analysis; and performance monitoring in general.

### 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 - 2020

- Mixed Mode

### 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**

Weighting: 20%

#### 2. **Written Assessment**

Weighting: 20%

#### 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 conversation

**Feedback**

Assignments requirements are not well explained.

**Recommendation**

Assignment one will be reviewed and students will be informed about requirements well in advance.

#### Feedback from Students in the class

**Feedback**

Student assignment feedback is late.

**Recommendation**

Student feedback with marks will be uploaded first and individual discussions will be organised later.

#### Feedback from Lecturer

**Feedback**

Zoom session attendance is poor.

**Recommendation**

Efforts will be made to match timings of the Zoom session that suits maximum number of students.

## Unit Learning Outcomes

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

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

n/a



## 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)
- Study Guide electronic copy on the Moodle website
- Online lecture sessions via Zoom
- Web Links of different topics

## 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  
[s.sharma2@cqu.edu.au](mailto:s.sharma2@cqu.edu.au)

## Schedule

### Week 1 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Module 1	Introduction to Condition Monitoring and tribology	On line lectures (Zoom sessions) will be announced by the lecturer, visit Moodle webpage for the date and time. Contact TASAC (IT Help desk, call 1300 666 620) for setting up Zoom software link at least a week before the term starts. <b>Lecture 1: Tuesday 10/03/2020 @ 6:00 pm. (Melbourne Time)</b>

### Week 2 - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Module 2	Topic: Oil analysis	View power point slides on Oil analysis and the following resource: <a href="https://www.youtube.com/watch?v=aoWBUhIN3-0">https://www.youtube.com/watch?v=aoWBUhIN3-0</a> <b>Lecture 2: Tuesday 10/03/2020 @ 6:00 pm. (Melbourne Time)</b>

### Week 3 - 23 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Visit ASTM standards website:  
<https://www.cqu.edu.au/courses/study-areas/science-and-environment/research/doctor-of-philosophy-sciences,-engineering-and-health>  
**NO LECTURE THIS WEEK**

Module 3 **Used Oil Analysis and ASTM Lubricant testing standards.**

**Week 4 - 30 Mar 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Module 3	Oil cleanliness	Group and forum discussion. Your assignment is due next Friday, ask questions in the zoom session. <b>Lecture 3: Tuesday 10/03/2020 @ 6:00 pm. (Melbourne Time)</b> <b>This Tuesday 31st of March is Census Date, you cannot add or drop this course after that.</b>

**Week 5 - 06 Apr 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Module 4	Vibration Analysis	<b>Lecture 4: Tuesday 10/03/2020 @ 6:00 pm. (Melbourne Time)</b> <b>Guest Lecture: on Vibration Analysis time and date TBA</b>  <b>Written Assessment-1</b> Due: Week 5 Friday (10 Apr 2020) 11:59 pm AEST

**Vacation Week - 13 Apr 2020**

Module/Topic	Chapter	Events and Submissions/Topic
		<b>NO LECTURE THIS WEEK</b>

**Week 6 - 20 Apr 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Module 4	Vibration Monitoring	Take part in forum activity. <b>Lecture 5: Tuesday 10/03/2020 @ 6:00 pm. (Melbourne Time)</b>  <b>GUEST LECTURE: Time and Date TBA</b>

**Week 7 - 27 Apr 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Module 5	Vibration Monitoring	Your assignment is due Friday next week, ask questions in the zoom session. <b>Lecture 6: Tuesday 10/03/2020 @ 6:00 pm. (Melbourne Time)</b>

**Week 8 - 04 May 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Module 6	Causes of Vibration	<b>Lecture 7: Tuesday 10/03/2020 @ 6:00 pm. (Melbourne Time)</b>  <b>Written Assessment-2</b> Due: Week 8 Friday (8 May 2020) 11:59 pm AEST

**Week 9 - 11 May 2020**

Module/Topic	Chapter	Events and Submissions/Topic
Module 2	Parameters and symptoms limits.	Visit suggested web links. <b>Lecture 8: Tuesday 10/03/2020 @ 6:00 pm. (Melbourne Time)</b>

Week 10 - 18 May 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Advance Condition Monitoring	Advanced Condition monitoring techniques an current trends	Visit the following website: <a href="https://maritimecyprus.files.wordpress.com/2016/05/absequipment_condition_monitoring.pdf">https://maritimecyprus.files.wordpress.com/2016/05/absequipment_condition_monitoring.pdf</a>
Week 11 - 25 May 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Financial Aspects of Condition Motoring	Return on investment- lecture slides	Forum discussions <b>No LECTURE THIS WEEK</b>
Week 12 - 01 Jun 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Revision	Mini-project queries	Your assignment is due Monday next week, ask questions in the zoom session. <b>Finalize Mini-project</b>
Review/Exam Week - 08 Jun 2020		
Module/Topic	Chapter	Events and Submissions/Topic
		<b>Presentation and Written Assessment - 3</b> Due: Review/Exam Week Monday (8 June 2020) 11:59 pm AEST
Exam Week - 15 Jun 2020		
Module/Topic	Chapter	Events and Submissions/Topic

## Assessment Tasks

### 1 Written Assessment-1

#### Assessment Type

Written Assessment

#### Task Description

The written assessment will cover general condition monitoring principles, Basic principles of Tribology (friction, wear and lubrication) and used oil analysis. Students must have good knowledge of ASTM standards for oil testing. Details of the assessment will be available in the question sheet posted on the Moodle web page of this unit. The assignment will be based on information gathered from your industry reports or interviews. Your interpretation of the information will demonstrate your knowledge of the company practices that you work with. The resources required for this assignment are not limited to the Learning Guide only, company reports, information from websites and books will be necessary.

#### Assessment Due Date

Week 5 Friday (10 Apr 2020) 11:59 pm AEST

Use standard file name format Please see the unit moodle webpage for the assessment criteria. A rubric will be available to explain the assessment criteria explicitly. Proper referencing is essential, use diagrams tables and charts as much as you can to beat the word count limit. Plan your assessment before writing so that it meets the assessment criteria and no part of the question is left unanswered. Quality of the contents carry marks.

#### Return Date to Students

Week 7 Friday (1 May 2020)

It is expected that marked assignments will be returned within 2 weeks of the due date of submission when submitted on time.

#### Weighting

20%

#### Assessment Criteria

The assessment criteria for this assignment is based on the clarity of problem definition and quality of the contents.

Provide overall clarity of expression, by using figures and tables, use them as a picture to control the word count limit. For other information such as, marking criteria, assignment question and the marking scheme for each question please visit the moodle web page of 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

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

### Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research

## 2 Written Assessment-2

### Assessment Type

Written Assessment

### 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. Question may require theoretical answers or based data that you collect from the work place. Students are expected to research resources listed on the Moodle web page, interviews and company reports. Please note that reading will not be limited to the Study Guide only.

### Assessment Due Date

Week 8 Friday (8 May 2020) 11:59 pm AEST

### Return Date to Students

Week 10 Friday (22 May 2020)

It is expected that marked assessment will be returned within 2 weeks of the due date when submitted on time

### Weighting

20%

### Assessment Criteria

The assessment criteria will be explained in the Assignment Question sheet posted on the Moodle web page. Marks will be assigned for each question in the question sheet. Each part of the question must be answered, part answered question will result in lower grade.

### 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

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



## Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management

## 3 Presentation and Written Assessment - 3

### Assessment Type

Presentation and Written Assessment

### Task Description

This assessment is a mini-project report where the project will be based on a condition monitoring plan that can be applied to upgrade condition monitoring practices at your own workplace. You may be required to use CMMS data from your company. or interview stake holders or collect information from reports and information available in books and websites. In case the data is confidential, inflate it or deflate it, as CQU does not take responsibility of the data security. Make use of tables and charts as a picture to minimize the word count as limit applies.

### Assessment Due Date

Review/Exam Week Monday (8 June 2020) 11:59 pm AEST

### Return Date to Students

Exam Week Monday (15 June 2020)

Marked assessments may be returned longer than 2 weeks period .Marks posted in the grade book for this assignment may change due to the moderation committee recommendation.

### Weighting

60%

### Assessment Criteria

The assessment criteria will be explained in the question sheet available on the Moodle web page. In this assignment a word count limit will apply. A rubric will be provided in the moodle webpage to explain the marking criteria explicitly. Proper referencing is essential. Answers should be short but to the point highlighting your own interpretation to reflect the workplace experience. Plan your assessment before writing so that it meets the assessment criteria and no part of the questions asked is left unanswered. Quality of the contents is important to score high marks.

### 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.

## Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility
- Leadership

## 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