



ENGG8405

Industrial Processes and Pollution Prevention

Session 2, In person-scheduled-weekday, North Ryde 2026

School of Engineering

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Disclaimer

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General Information

Unit convenor and teaching staff

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Credit points

10

Prerequisites

Corequisites

Co-badged status

Unit description

The objective of this unit is to provide an understanding of pollution prevention fundamentals, featuring examples and case studies from different industries. It includes methods of waste minimization, energy and water conservation, and green engineering. The units include topics of contaminant sources identification and assessment, waste characterization, process intensification, process and product life cycle assessment, control of fugitive emissions, and environmental risk assessment and management.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Industry, Innovation and Infrastructure; Responsible Consumption and Production; Climate Action

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

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

ULO1: Articulate the critical nature of pollution prevention, and provide an advanced review of what pollution prevention is and how it is implemented.

ULO2: Model and analyse the environmental impacts of process and product using a life cycle approach.

ULO3: Evaluate and improve manufacturing processes for waste minimization.

ULO4: Develop and review appropriate environmental risk management strategies.

ULO5: Research and proficiently communicate technical information to specialist and

non-specialist audiences.

General Assessment Information

Grading and passing requirement for unit

In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/CR/D/HD) and pass the final examination.

For further details about grading, please refer below in the policies and procedures section.

No Hurdle Requirements

Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following university standard late penalty applied. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at **11:55 pm**. A 1-hour grace period is provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for [Special Consideration](#).

Assessments

Your assessments are a key element in your learning process. Find out about the types of assessments you may need to complete at Macquarie University.

Individual reflective on the real-world industry pollution case

Assessment Type ¹: Case study/analysis

Indicative Time on Task ²: 25 hours

Due: **15/10/2025**

Weighting: **30%**

Groupwork/Individual: **Individual oral presentation**

Short extension ³: No

AI Approach: Only for language polishing

This is an individual project. On successful completion you will be able to:

- Articulate the critical nature of pollution prevention, and provide an advanced prospective

of what pollution prevention is and how it is implemented.

- Model and analyse the environmental impacts of process and product using a life cycle approach.
- Evaluate and improve manufacturing processes for waste minimization.
- Develop and review appropriate environmental risk management strategies.
- Research and proficiently communicate technical information to specialist and non-specialist audiences.

Group term project

Assessment Type ¹: Project assessment

Indicative Time on Task ²: 40 hours

Due: **05/11/2025**

Weighting: **20%**

Groupwork/Individual: Groupwork

Short extension ³: No

AI Approach: Only for language polishing

This is a group term project where groups work on aspects relating to industrial processes and pollution prevention based on the reference resources provided, with a focus on a particular industry (e.g. oil and gas, mining, cement, etc.). Students will receive feedback on their progress to achieve each learning outcome during the semester. This will happen by breaking the project to different tasks and assessing the project based on achieving the learning outcomes individually.

On successful completion you will be able to:

- Articulate the critical nature of pollution prevention, and provide an advanced review of what pollution prevention is and how it is implemented.
- Model and analyse the environmental impacts of process and product using a life cycle approach.
- Evaluate and improve manufacturing processes for waste minimization.
- Develop and review appropriate environmental risk management strategies.
- Research and proficiently communicate technical information to specialist and non-specialist audiences.

Final Examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 20 hours

Due: **30/11/2025**

Weighting: **50%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Not allowed

On successful completion you will be able to:

- Articulate the critical nature of pollution prevention, and provide an advanced review of what pollution prevention is and how it is implemented.
- Model and analyse the environmental impacts of process and product using a life cycle approach.
- Evaluate and improve manufacturing processes for waste minimization.
- Develop and review appropriate environmental risk management strategies.
- Research and proficiently communicate technical information to specialist and non-specialist audiences.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
<u>Final Exam</u>	50%	No	Examination Period	Individual	No	Observed
<u>Individual reflective on the real-world industry pollution case</u>	30%	No	15/10/2026	Individual	Yes	Open
<u>Group term project</u>	20%	No	05/11/2026	Individual and Group	No	Open

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 20 hours

Due: **Examination Period**

Weighting: **50%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will undertake a final examination during the formal examination period.

On successful completion you will be able to:

- Articulate the critical nature of pollution prevention, and provide an advanced review of what pollution prevention is and how it is implemented.
- Model and analyse the environmental impacts of process and product using a life cycle approach.
- Evaluate and improve manufacturing processes for waste minimization.
- Develop and review appropriate environmental risk management strategies.
- Research and proficiently communicate technical information to specialist and non-specialist audiences.

Individual reflective on the real-world industry pollution case

Assessment Type ¹: Reflection task

Indicative Time on Task ²: 25 hours

Due: **15/10/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

You will complete an individual reflective task that references real-world datasets and how this approach can be applied in engineering practice.

On successful completion you will be able to:

- Articulate the critical nature of pollution prevention, and provide an advanced review of what pollution prevention is and how it is implemented.
- Model and analyse the environmental impacts of process and product using a life cycle approach.
- Evaluate and improve manufacturing processes for waste minimization.
- Develop and review appropriate environmental risk management strategies.
- Research and proficiently communicate technical information to specialist and non-specialist audiences.

Group term project

Assessment Type ¹: Portfolio

Indicative Time on Task ²: 40 hours

Due: **05/11/2026**

Weighting: **20%**

Groupwork/Individual: Individual and Group

Short extension ³: No

AI Approach: Open

You will complete a group-based project on industrial processes and pollution prevention. You will individually complete specific tasks within the group project and be marked for your individual delivery of those tasks. The group will also receive a mark for the group component that will be clearly described in the unit guide and matrix

On successful completion you will be able to:

- Articulate the critical nature of pollution prevention, and provide an advanced review of what pollution prevention is and how it is implemented.
- Model and analyse the environmental impacts of process and product using a life cycle approach.
- Evaluate and improve manufacturing processes for waste minimization.
- Develop and review appropriate environmental risk management strategies.
- Research and proficiently communicate technical information to specialist and non-specialist audiences.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- [Academic Success](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation.

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

Slides, notes, and journal papers presenting during the Lectures.

Unit Schedule

Unit schedule:

Week	Lecture /Content / Topic	Chapter Ref	STGA: HBR Case Study
1	Fundamentals of Environment and Sustainability	Part 1	Q & A Discuss

Week	Lecture /Content / Topic	Chapter Ref	STGA: HBR Case Study
2	Pollution and Prevention	Part 2	Q & A Discuss
3	Reuse	Part 3	Q & A Discuss
4	Recycling	Part 4	Q & A Discuss
5	Treatment	Part 5	Q & A Discuss
6	Treatment	Part 6	Lab experiments observation
7	Individual reflective on the real-world industry pollution case		Q & A Discuss
8	Life Cycle Assessment	Part 7	Q & A Discuss
9	Environmental Impact Assessment	Part 8	Q & A Discuss
10	Process Fundamentals	Part 9	Q & A Discuss
11	Standards and Environmental Management	Part 10	Q & A Discuss
12	Invited Lecture	Environmental management experience sharing from industry & Research sharing from university	
13-14	Group term project	Part 11	

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.smq.edu.au\)](https://policies.smq.edu.au). Students should be aware of the following policies in particular with regard to

Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies](https://students.mq.edu.au/support/study/policies) (<https://students.mq.edu.au/support/study/policies>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit connect.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Ask a Study Coach](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

New Unit

Unit information based on version 2026.03 of the [Handbook](#)