



ENGG8401

Safety and Risk Engineering

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Engineering

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Unit Convener

Rouzbeh Abbassi

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Contact via Email

Room 107, 44 Waterloo Rd

Should be set via email

Credit points

10

Prerequisites

Admission to MEngEnvSafetyEng or MEngMgt

Corequisites

Co-badged status

Unit description

The objective of this unit is to provide an understanding of principles and methods of safety and risk engineering applicable to industrial operation. Specific topics include analysis of past accidents; risk assessment methods, risk analysis tools, risk-based decision making, process safety, engineering safety, occupational safety, safety assessment studies, and regulatory perspective of safety.

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: Demonstrate advanced knowledge of risk and safety engineering.

ULO2: Interpret and synthesise various methodologies and tools applicable in risk analysis and accident modelling.

ULO3: Critically review safety performance in a range of engineering operations.

ULO4: Apply risk-based design decision methods to industrial operations.

ULO5: Design risk-based safety measures for complex engineering operations.

General Assessment Information

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).

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

Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.

All other assessments must be submitted by 5:00 pm on their due date.

Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

Assessments not submitted by the due date will receive a mark of zero.

If you receive [special consideration](#) for the final exam, a supplementary exam will be scheduled by the faculty during a supplementary exam period, typically about 3 to 4 weeks after the normal exam period. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

The final examination is a hurdle requirement. A grade of 40 or more in the final examination is a condition of passing this unit. If you are given a second opportunity to sit the final examination as a result of failing to meet the minimum mark required, you will be offered that chance during the supplementary examination period and will be notified of the exact day and time after the publication of final results for the unit. The second attempt at a hurdle assessment is graded as pass fail.

Assessment Tasks

Name	Weighting	Hurdle	Due
Term Project	50%	No	Friday, Week 13
Mid-term	20%	No	Week 7
Final Exam	30%	Yes	TBA

Term Project

Assessment Type ¹: Project

Indicative Time on Task ²: 80 hours

Due: **Friday, Week 13**

Weighting: **50%**

This is a group term project. Students are going to work on the project from the beginning of the semester. Each group will work on safety and risk engineering applications 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 individual learning outcome during the semester. This will happen by breaking the project to different tasks by the lecturer (considering each individual learning outcome), and assess the project based on achieving the learning outcomes individually.

On successful completion you will be able to:

- Demonstrate advanced knowledge of risk and safety engineering.
- Interpret and synthesise various methodologies and tools applicable in risk analysis and accident modelling.
- Critically review safety performance in a range of engineering operations.
- Apply risk-based design decision methods to industrial operations.
- Design risk-based safety measures for complex engineering operations.

Mid-term

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 2 hours

Due: **Week 7**

Weighting: **20%**

Students will be assessed at the mid of the semester. This will be an open book exam for 2 hours.

On successful completion you will be able to:

- Demonstrate advanced knowledge of risk and safety engineering.
- Interpret and synthesise various methodologies and tools applicable in risk analysis and accident modelling.
- Critically review safety performance in a range of engineering operations.
- Apply risk-based design decision methods to industrial operations.
- Design risk-based safety measures for complex engineering operations.

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 3 hours

Due: **TBA**

Weighting: **30%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

This will be a 3 hrs open book exam.

On successful completion you will be able to:

- Demonstrate advanced knowledge of risk and safety engineering.
- Interpret and synthesise various methodologies and tools applicable in risk analysis and accident modelling.
- Critically review safety performance in a range of engineering operations.
- Apply risk-based design decision methods to industrial operations.
- Design risk-based safety measures for complex engineering operations.

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
- the [Writing Centre](#) 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

Delivery and Resources

Teaching materials including lecture notes and slides provided by the instructor

Scientific calculators

Unit Schedule

Refer to iLearn and lecture notes for the unit schedule

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.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 ask.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/>

The Writing Centre

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

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [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 Enquiries

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

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

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

N/A

Engineers Australia Competency Mapping

EA Competency Standard		Unit Learning Outcomes
Knowledge and Skill Base	1.1 Comprehensive, theory-based understanding of the underpinning fundamentals applicable to the engineering discipline.	ULO1
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	ULO1 and ULO2
	1.3 In-depth understanding of specialist bodies of knowledge	
	1.4 Discernment of knowledge development and research directions	
	1.5 Knowledge of engineering design practice	ULO2
	1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice.	
Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving	ULO1

	2.2 Fluent application of engineering techniques, tools and resources.	ULO1
	2.3 Application of systematic engineering synthesis and design processes.	ULO4, ULO5
	2.4 Application of systematic approaches to the conduct and management of engineering projects.	ULO2, ULO3
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.	
	3.2 Effective oral and written communication in professional and lay domains.	ULO4, ULO5
	3.3 Creative, innovative and pro-active demeanour.	
	3.4 Professional use and management of information.	
	3.5 Orderly management of self, and professional conduct.	
	3.6 Effective team membership and team leadership	