COURSE OUTLINE

ENG709 Risk Engineering

School: School of Science, Technology and Engineering

2026 | Trimester 2

UniSC Moreton Bay	BLENDED LEARNING	Most of your course is on campus but you may be able to do some components of this course online.
Online	ONLINE	You can do this course without coming onto campus, unless your program has specified a mandatory onsite requirement.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

This course explores the concept of risk, how it is assessed and managed with a particular emphasis on how to mitigate risks in a project management setting.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous weekly learning material	1hr	Week 1	12 times
Seminar – On campus	1hr	Week 1	3 times
Tutorial/Workshop 1 – On campus	2hrs	Week 1	10 times
ONLINE			
Learning materials – Asynchronous weekly learning material	1hr	Week 1	12 times
Seminar – Online	1hr	Week 1	3 times
Tutorial/Workshop 1 – Online	2hrs	Week 1	10 times

1.3. Course Topics

Topics may include:

- Introduction to risk engineering and terminologies.
- Human perception of risk.
- Risk and Reliability modelling and analysis. Hazard Identification techniques
- Human factors in Risk.
- Technical tools for Risk Engineers.
- Modelling of accidents; Reliability Block diagram (RBD); Cause-Consequence Diagrams (CCD); Fault and Success Trees Analysis
- (F&STA); Event Trees Analysis (ETA)
- Industrial hazards and their risk assessment Emergency planning, documentation and management.
- Recent issues in risk engineering.
- Engineering risk management report writing and communication.

2. What level is this course?

700 Level (Specialised)

Demonstrating a specialised body of knowledge and set of skills for professional practice or further learning. Advanced application of knowledge and skills in unfamiliar contexts.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES On successful completion of this course, you should be able to...	GRADUATE QUALITIES MAPPING Completing these tasks successfully will contribute to you becoming...	PROFESSIONAL STANDARD MAPPING * Engineers Australia Stage 1 Professional Engineer Competency Standards
1 Discern and categorise safety and/or financial hazards through standardised, systematic and structured documentation processes.	Knowledgeable Sustainability-focussed	1, 1.6.b, 1.6
2 Critically review engineering and administrative control measures to manage potential risks in engineering projects, including technical, environmental, and safety risks.	Creative and critical thinker	2, 2.1.a, 2.1
3 Construct models for analysing accidents & consequences through Event Tree Analysis (ETA) and Fault Tree Analysis (FTA) techniques.	Creative and critical thinker	2, 2.1.a, 2.1
4 Apply advanced risk analysis techniques, including appropriate software tools and methodologies, to model and evaluate risks in order to make informed decisions and optimize risk management strategies.	Empowered	2, 2.3.b, 2.3
5 Apply engineering principles, standards, and best practices to design and implement risk mitigation measures that ensure the safety, reliability, and efficiency of engineering systems.	Empowered Ethical	2, 2.3.b, 2.3
6 Cultivate a culture of proactive risk management within engineering projects and integrate risk management principles into all stages of the engineering lifecycle.	Ethical	3, 3.1.b, 3.1

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
1.6.b	Knowledge and Skill Base - Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline: Appreciates the principles of safety engineering, risk management and the health and safety responsibilities of the professional engineer, including legislative requirements applicable to the engineering discipline.
1.6	Knowledge and Skill Base: Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.

CODE	COMPETENCY
2	Elements of competency: Engineering Application Ability
2.1.a	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Identifies, discerns and characterises salient issues, determines and analyses causes and effects, justifies and applies appropriate simplifying assumptions, predicts performance and behaviour, synthesises solution strategies and develops substantiated conclusions.
2.3.b	Engineering Application Ability - Application of systematic engineering synthesis and design processes: Addresses broad contextual constraints such as social, cultural, environmental, commercial, legal political and human factors, as well as health, safety and sustainability imperatives as an integral part of the design process.
2.1	Engineering Application Ability: Application of established engineering methods to complex engineering problem solving.
2.3	Engineering Application Ability: Application of systematic engineering synthesis and design processes.
3	Elements of competency: Professional and Personal Attributes
3.1.b	Professional and Personal Attributes - Ethical conduct and professional accountability: Understands the need for 'due-diligence' in certification, compliance and risk management processes.
3.1	Professional and Personal Attributes: Ethical conduct and professional accountability.

5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of "pre-requisites, co-requisites and anti-requisites".

5.1. Pre-requisites

Enrolled in GC006, GD006 or MC006

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Case Study	Individual	20%	Min. 1000 words.	Week 3	Online Assignment Submission with plagiarism check
All	1a	Written Piece	Individual	20%	1 x demonstration, 2000 words	Week 6	Online Assignment Submission with plagiarism check
All	1b	Written Piece	Individual	25%	Min. 2000 words	Week 9	Online Assignment Submission with plagiarism check
All	2	Oral and Written Piece	Individual	35%	5 minutes plus 3000 words	Week 12	Online Assignment Submission with plagiarism check

All - Assessment Task 1: Identification of Risks and Preliminary Analysis

GOAL:	Early application of high level risk analysis for a selected case study.
PRODUCT:	Case Study
AUTHORSHIP STATEMENT:	
FORMAT:	Written report.
CRITERIA:	

No.		Learning Outcome assessed
1	Identify a variety of risks in an engineering case study, including: project; financial, health, or logistical.	1 5 6
2	Provide a high level analysis of the identified risks, qualitative or quantitative.	1 5 6
3	Cultivation of a culture of proactive risk management within engineering projects and integration of risk management principles into all stages of the engineering lifecycle.	6
4	Identify ethical considerations of risk management in a case study.	1 5 6

GENERIC SKILLS:	Communication, Problem solving, Applying technologies

All - Assessment Task 1a: Practical/Laboratory Skills, and Written Piece

GOAL:	Interim demonstration of risk and reliability modelling and analysis reported for a selected engineering project, and the drafting of a risk management plan. This builds on the case study from assessment 1, building a qualitative risk assessment plan.
PRODUCT:	Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Interim demonstration of risk and reliability modelling and analysis reported for a selected engineering project.

CRITERIA:

No.		Learning Outcome assessed
1	Critical review of engineering and administrative control measures to manage potential risks in engineering projects, including technical, environmental, and safety risks.	2
2	Construction of models for analysing accidents & consequences through Event Tree Analysis (ETA) and Fault Tree Analysis (FTA) techniques.	3
3	Application of advanced risk analysis techniques, including appropriate software tools and methodologies, to model and evaluation of risks in order to make informed decisions and optimise risk management strategies.	4
4	Application of engineering principles, standards, and best practices to design and implement risk mitigation measures that ensure the safety, reliability, and efficiency of engineering systems.	5
5	Cultivation of a culture of proactive risk management within engineering projects and integration of risk management principles into all stages of the engineering lifecycle.	6
6	Discernment and categorisation of safety and/or financial hazards through standardised, systematic and structured documentation processes.	1

GENERIC SKILLS:	Communication, Problem solving, Applying technologies

All - Assessment Task 1b: Quantitative Risk Analysis and Event Analysis

GOAL:	Analysis of a case study through applying quantitative risk analysis concepts and event analysis tools. This builds on the case study from assessment 1, building a quantitative risk analysis and response plan as well as further tools developed since the prior assessment.
PRODUCT:	Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Written report.

CRITERIA:

No.		Learning Outcome assessed
1	Cultivation of a culture of proactive risk management within engineering projects and integration of risk management principles into all stages of the engineering lifecycle.	6
2	Apply quantitative risk assessment concepts to a practical case analysis.	1 5 6
3	Demonstrate ability to apply appropriate event analysis tools to a practical application.	1 5 6

GENERIC SKILLS:	Communication, Problem solving, Applying technologies

All - Assessment Task 2: Oral and Written Piece

GOAL:	Final engineering risk management report writing and communication through a short presentation. This is a separate case analysis, integrating all skills developed throughout the class, crisis management, governance and compliance, ethical frameworks, and all tools developed in the class that are relevant to the analysis.
PRODUCT:	Oral and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Report and presentation

CRITERIA:

No.		Learning Outcome assessed
1	Critical review of engineering and administrative control measures to manage potential risks in engineering projects, including technical, environmental, and safety risks.	2
2	Construction of models for analysing accidents & consequences through Event Tree Analysis (ETA) and Fault Tree Analysis (FTA) techniques.	3
3	Application of advanced risk analysis techniques, including appropriate software tools and methodologies, to model and evaluation of risks in order to make informed decisions and optimise risk management strategies.	4
4	Application of engineering principles, standards, and best practices to design and implement risk mitigation measures that ensure the safety, reliability, and efficiency of engineering systems.	5
5	Cultivation of a culture of proactive risk management within engineering projects and integration of risk management principles into all stages of the engineering lifecycle.	6
6	Discernment and categorisation of safety and/or financial hazards through standardised, systematic and structured documentation processes.	1

GENERIC SKILLS:	Communication, Applying technologies, Information literacy

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

There are no required/recommended resources for this course.

8.2. Specific requirements

Not applicable

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:
(a) The final mark is in the percentage range 47% to 49.4%; and
(b) The course is graded using the Standard Grading scale

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying: - The final mark is in the percentage range 47% to 49.4% - The course is graded using the Standard Grading scale - You have not failed an assessment task in the course due to academic misconduct

10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:
(a) One day: deduct 5%;
(b) Two days: deduct 10%;
(c) Three days: deduct 20%;
(d) Four days: deduct 40%;
(e) Five days: deduct 60%;
(f) Six days: deduct 80%;
(g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:
Less than 15 minutes: No penalty
From 15 minutes to 30 minutes: 20% penalty
More than 30 minutes: 100% penalty

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

For course-specific questions, contact your teaching staff or Course Coordinator.

For other enquiries or to access support, please contact Student Central:

- UniSC Student Central
- UniSC Adelaide Student Central