ENGG2050
Engineering Systems and Design Thinking
Session 1, Weekday attendance, North Ryde 2021
School of Engineering

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Notice
As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to timetable viewer. To check detailed information on unit assessments visit your unit’s iLearn space or consult your unit convenor.
# General Information

## Unit convenor and teaching staff

**Convenor**

Nicholas Tse  
[nicholas.tse@mq.edu.au](mailto:nicholas.tse@mq.edu.au)

Contact via email  
50 Waterloo Road  
via email or Wed

**Convenor**

Rex Di Bona  
[rex.dibona@mq.edu.au](mailto:rex.dibona@mq.edu.au)

Contact via email  
50 Waterloo Road  
Fri 3pm - 5pm

## Credit points

10

## Prerequisites

(ENGG1050 or ENGG100) and (COMP1000 or COMP115) and (MATH1010 or MATH1015 or MATH135 or MATH132 or MATH1007 or DMTH137)

## Corequisites

## Co-badged status

## Unit description

The 3rd SPINE unit aimed to develop professional, transferable and employability skills. The unit deals with the design of complex systems from a top-down perspective. Students will be exposed to different engineering management approaches (waterfall and Agile) and other tools involved in the field of systems engineering. Students will be able to apply Design Thinking processes and apply problem-solving heuristics to solve complex engineering systems.

# Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at [https://students.mq.edu.au/important-dates](https://students.mq.edu.au/important-dates)

# Learning Outcomes

On successful completion of this unit, you will be able to:
ULO1: Evaluate a complex engineering problem from a range of perspectives, such as technological, social, environmental, financial, professional and ethical.

ULO2: Analyse and describe large engineering problems and related systems and subsystems.

ULO3: Apply appropriate engineering modelling and management tools in analysing a large engineering system.

ULO4: Apply design thinking and associated thinking techniques in generating a variety of solutions.

ULO5: Explain and integrate human and non-technical elements in an engineering project and its associated systems.

**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).

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

**Professional Hurdle (Fitness to practice)**

Starting from 2nd year and onwards, all SPINE units will be applying the professional hurdle requirement or widely known as “Fitness to Practice”. According to the policy, fitness to practice is deemed as exhibiting behaviours that demonstrate professional competence, acceptable professional behaviour, freedom from an impairment, and compliance with program-specific requirements needed for a student to practice properly and safely throughout their Practical, Clinical or Professional program or unit. Failure to demonstrate these qualities will result in students being at risk of progressing in the professional engineering program regardless of their marks and grades within individual units. Please refer to the University policy for further details.

**Assessment Tasks**

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop participation</td>
<td>10%</td>
<td>No</td>
<td>Throughout semester</td>
</tr>
<tr>
<td>Online quizzes</td>
<td>40%</td>
<td>No</td>
<td>W3-13 (see iLearn)</td>
</tr>
<tr>
<td>Case study 1</td>
<td>15%</td>
<td>No</td>
<td>W5</td>
</tr>
</tbody>
</table>

[https://unitguides.mq.edu.au/unit_offerings/129953/unit_guide/print]
<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>In class presentation</td>
<td>10%</td>
<td>No</td>
<td>W7</td>
</tr>
<tr>
<td>Case study 2</td>
<td>15%</td>
<td>No</td>
<td>W10</td>
</tr>
<tr>
<td>Infographic submission</td>
<td>10%</td>
<td>No</td>
<td>W13</td>
</tr>
</tbody>
</table>

**Workshop participation**

Assessment Type 1: Participatory task  
Indicative Time on Task 2: 0 hours  
Due: Throughout semester  
Weighting: 10%

Weekly participation in workshop activities. Indicative hours spent on assessment excludes scheduled workshop hours.

On successful completion you will be able to:

- Evaluate a complex engineering problem from a range of perspectives, such as technological, social, environmental, financial, professional and ethical.
- Analyse and describe large engineering problems and related systems and subsystems.
- Apply appropriate engineering modelling and management tools in analysing a large engineering system.
- Apply design thinking and associated thinking techniques in generating a variety of solutions.
- Explain and integrate human and non-technical elements in an engineering project and its associated systems.

**Online quizzes**

Assessment Type 1: Quiz/Test  
Indicative Time on Task 2: 8 hours  
Due: W3-13 (see iLearn)  
Weighting: 40%

8 online quizzes throughout session
On successful completion you will be able to:

- Analyse and describe large engineering problems and related systems and subsystems.
- Apply appropriate engineering modelling and management tools in analysing a large engineering system.
- Apply design thinking and associated thinking techniques in generating a variety of solutions.
- Explain and integrate human and non-technical elements in an engineering project and its associated systems.

Case study 1
Assessment Type 1: Case study/analysis
Indicative Time on Task 2: 20 hours
Due: W5
Weighting: 15%

Case study on engineering systems

On successful completion you will be able to:

- Evaluate a complex engineering problem from a range of perspectives, such as technological, social, environmental, financial, professional and ethical.
- Analyse and describe large engineering problems and related systems and subsystems.
- Explain and integrate human and non-technical elements in an engineering project and its associated systems.

In class presentation
Assessment Type 1: Presentation
Indicative Time on Task 2: 2 hours
Due: W7
Weighting: 10%

In class presentation on a given research topic

On successful completion you will be able to:

- Apply appropriate engineering modelling and management tools in analysing a large engineering system.
• Explain and integrate human and non-technical elements in an engineering project and its associated systems.

Case study 2
Assessment Type 1: Case study/analysis
Indicative Time on Task 2: 20 hours
Due: W10
Weighting: 15%

Case study on engineering systems

On successful completion you will be able to:
• Evaluate a complex engineering problem from a range of perspectives, such as technological, social, environmental, financial, professional and ethical.
• Analyse and describe large engineering problems and related systems and subsystems.
• Explain and integrate human and non-technical elements in an engineering project and its associated systems.

Infographic submission
Assessment Type 1: Poster
Indicative Time on Task 2: 5 hours
Due: W13
Weighting: 10%

Submission of infographics on a given topic relating to systems engineering

On successful completion you will be able to:
• Analyse and describe large engineering problems and related systems and subsystems.
• Apply design thinking and associated thinking techniques in generating a variety of solutions.
• Explain and integrate human and non-technical elements in an engineering project and its associated systems.

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 Learning Skills Unit 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**

**COMMUNICATIONS**

• Students are reminded the University will communicate all official notices to you by email to your university email account. Please read your @student.mq.edu.au email regularly, or forward it to an account you do read regularly.

• All announcements and other communications regarding this unit will be via the unit iLearn website, https://ilearn.mq.edu.au/

• Please do not email unit convenors and tutors directly, but instead use the "General Discussion" or "Dialogue" tabs on the unit website in iLearn.

**TEXTBOOK**


• It is expected that every student will have access to this textbook - weekly readings are assigned (see the Unit Schedule on the unit's iLearn website) and must be completed before class.

**OTHER RESOURCES**

• The iLearn web page for this unit can be found at: https://ilearn.mq.edu.au/login/MQ/

• All unit resources and communications relating to this unit, including a week-by-week schedule of learning and assessment activities, will be provided via the iLearn unit website.

**Unit Schedule**

refer to iLearn for detailed schedule

**Policies and Procedures**

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:
Students seeking more policy resources can visit Student 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) 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

**Student Support**

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

**Learning Skills**

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- 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
Student Enquiry Service
For all student enquiries, visit Student Connect at ask.mq.edu.au
If you are a Global MBA student contact globalmba.support@mq.edu.au

Equity Support
Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

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
This is a new unit offering.