# Course Outline Public

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## Course Details

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| **Course Code** | GSOE9210 |
| **Course Title** | Engineering Decisions |
| **Units of Credit** | 6 |
| **Course Website** | http://cse.unsw.edu.au/~gs9210 (http://cse.unsw.edu.au/~gs9210) |
| **Handbook Entry** | http://www.handbook.unsw.edu.au/postgraduate/courses/current/GSOE9210.html (http://www.handbook.unsw.edu.au/postgraduate/courses/current/GSOE9210.html) |

## Course Summary

The topics covered in this course include:

- Decision problems
- Representing decision problems
- Decision-making under uncertainty
- Measuring belief and uncertainty
- Measuring preference
- Decisions involving others

# Course Timetable

The course timetable is available here (/GSOE9210/18s2/timetable) .

# Course Aims

The course helps prepare engineering graduates for decision making roles. Emphasis is on methods and techniques which are universally applicable to a wide variety of problems across different engineering disciplines.

# Student Learning Outcomes

After successfully completing this course students should be able to:

- *identify the key elements in a decision*
- *model decisions in analytical form*
- *compare modelling trade-offs and their implications*
- *apply a variety of analytical techniques to derive solutions to decision models*
- *evaluate, revise, and justify decision models and their solutions*

# General educational benefits

Rational decision-making is a fundamental skill that exercises a range of both analytical and practical problem-solving skills. The course focusses on universal skills that are applicable to a wide range of problems, complementing the skill-set required by graduate engineers. Because the focus is on universal techniques, the course learnings help develop the students' ability to apply their knowledge to a wide range of problems beyond the immediate scope of the course.

# Assumed Knowledge

There are no formal prerequisites for this course. The student will require general logical reasoning and problem-solving skills. Some elementary knowledge of statistics, including probability, and discrete mathematics will be helpful, but is not essential.

# Teaching Rationale

Ron Howard, Professor of Economic-Engineering Systems at Stanford:

> “If . . . decision-theoretic structures do not in the future occupy a large part of the education of engineers, then the engineering profession will find that its traditional role of managing scientific and economic resources for the benefit of man has been forfeited to another profession.”

—Ron Howard (1966)

Professor of Management Science and Engineering

Stanford University

# Teaching Strategies

The learning activities include:

- Lectures: classes that introduce basic concepts and give examples

- Tutorials: part of each class is devoted to working through problems and case studies examples
- Forums: this website has a forum for students to discuss the course material. The forum provides a student-oriented, collaborative approach to learning from/with one's peers
- Exercises: released each week for students to practice solving problems
- Student consultations: scheduled regularly in-session to provide additional support for student learning

# Assessment

The final mark for the course is based on a mid-term paper and a final exam. The mid-term paper is worth 40% and the final exam is worth 60% of the final mark. The dates and times of the mid-term will be announced in class closer to the date.

The course uses a full grading scheme, following the UNSW scale

> 85+ → HD, 75–84 → DN, 65–74 → CR, 50–64 → PS

**Supplementary assessment**

For information about special consideration, including the date of the supplementary exam, please read CSE Student Conduct (https://www.engineering.unsw.edu.au/computer-science-engineering/about-us/organisational-structure/student-services/policies/essential-advice-for-cse-students) .

For information about UNSW's policy regarding supplementary assessments, see https://student.unsw.edu.au/special-consideration (https://student.unsw.edu.au/special-consideration) .

The supplementary exam is only for those who, due to circumstances beyond their control, were unable to complete some assessment, or who believe that their original mark was affected so as to be significantly worse than they would score under normal circumstances. You should only apply for a supplementary exam with the understanding that, prior to knowing the outcome of the original assessment, the original mark for that assessment will be discarded. Note that original assessment marks, final exam marks, and overall course grade, will not be released to students prior to completion of the supplementary exam. Be warned that the difficulty of the supplementary exam may exceed that of the original assessment.

For this course, special consideration requests must be accompanied with a certificate from the relevant authority (eg, doctor, lawyer, etc.). This must be accompanied with a completed and signed *Professional Authority form* ( https://student.unsw.edu.au/sites/all/files/upload... (https://student.unsw.edu.au/sites/all/files/uploads/group47/forms/ProfessionalAuthority.pdf) ). Please ensure you take a copy of the form with you to the relevant authority, and submit the completed form with your special consideration request. Special consideration requests which do not provide this information will be deemed inadmissible.

# Academic Honesty and Plagiarism

**Plagiarism** is defined as (https://student.unsw.edu.au/what-plagiarism) *using the words or ideas of others and presenting them as your own* . UNSW treats plagiarism as academic misconduct, which means that it carries penalties as severe as being excluded from further study at UNSW. There are several on-line sources to help you understand what plagiarism is and how it is dealt with at UNSW:

- Learning Centre: Plagiarism and Academic Integrity (http://www.lc.unsw.edu.au/plagiarism/index.html)
- MyUNSW: Plagiarism (https://student.unsw.edu.au/plagiarism) and Academic Misconduct (https://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf)
- CSE: Addendum to UNSW Plagiarism Guidelines (http://www.cse.unsw.edu.au/~chak/plagiarism/plagiarism.html)

- CSE: Yellow Form (http://www.cse.unsw.edu.au/people/studentoffice/policies/yellowform.html) (whose terms you have agreed to)

Make sure that you read and understand these. Ignorance is not accepted as an excuse for plagiarism.

# Course Schedule

The course consists of twelve (10) weeks of classes. Each week will have two 2-hour classes, on of which will have a theoretical (lecture) emphasis and other practical (tutorial). The practical component consists of working through model exercise problems and their solutions.

Assessment for this course consists of a mid-term paper and a final exam. The dates and times of the mid-term paper will be announced closer to the date.

# Resources for Students

Class materials are available on the website. For some materials students may need to log-in. Class materials consist of notes (and copies of the slides), tutorial problems, and reference materials.

The lectures are recorded and are available to students through UNSW's student gateway. See the course menu on the left for more information.

There is no prescribed textbook for the course. The posted materials are sufficient to prepare for the exams. Additional reference materials will be provided during the course.

**Reference books**
Luce and Raiffa. *Games and Decisions* . Dover, 1957.
*One of the classic references on game and decision theory. Middle to advanced level. Most relevant for the latter parts of the course.*
Straffin, P. *Game theory and strategy* . Mathematical Association of America, 1993.

# Student information

If you have any questions regarding the administration course, such as questions regarding enrolment, etc., please check the FAQ (https://www.engineering.unsw.edu.au/study-with-us/current-students/student-resources/frequently-asked-questions) . You can send those questions to the relevant person by filling the corresponding online form (https://www.engineering.unsw.edu.au/study-with-us/current-students/student-resources/online-forms) .

# Course Evaluation and Development

Student feedback for this course will be obtained via an electronic survey at the end of session, for the purposes of ongoing improvements to the course. Students are encouraged to provide informal feedback during the session, and to advise the lecturer in charge of any important matters that arise. Feedback is welcome, and will be received openly, positively, constructively, and thankfully.

The course has been well-received by students in previous terms.

In response to feedback from previous course offerings the course material seeks to closely emphasise the applicability and relevance of the learnings to practical engineering problems.

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Comments

(/GSOE9210/19T3/forums/search?forum_choice=resource/33021) (/GSOE9210/19T3/forums/resource/33021)

There are no comments yet.