Course Outline

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Course Details

Course Code	GSOE9210
Course Title	Engineering Decisions
Units of Credit	6
Course Website	http://www.cse.unsw.edu.au/~gs9210 (http://www.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

This course focuses on the logic of decision-making. The topics covered include:

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

Course Timetable

The course timetable is available here (https://webcms3.cse.unsw.edu.au/GSOE9210/21T3/timetable) .

Course Aims

The course prepares engineers for decision-making roles by developing their proficiency in analytical decision-making.

Student Learning Outcomes

After you've successfully completed this course you 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 broad range of analytical and practical problem-solving skills. The course's focus on universal principles allows students to become informed and competent decision-makers in the broader context of their professional and personal lives.

Assumed Knowledge

There are no formal prerequisites for this course, although some elementary knowledge of statistics, probability, and discrete mathematics will be helpful. The most important prerequisites are general logical reasoning and problem-solving skills and the ability to make abstractions.

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 and Learning Activities

The course's teaching and learning activities include:

- Lectures: classes that introduce basic concepts and give 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

Course Schedule

The course consists of ten (10) weeks of classes. Each week, video lectures and exercise sets will be provided. No new material will be covered in week 6, but some supplementary material or optional tutorials/consultation blocks may be scheduled.

Assessment for this course consists of four (4) in-course online quizzes and a final exam. The quizzes will be held in weeks 3, 5, 7, and 9.

Assessment

The final mark for the course is based on a combination of in-course assessment and a final exam. The in-course assessment contributes 40% of the final mark; it consists of four (4) online quizzes each worth 10%. The final exam is worth the remaining 60%. The schedule for the quizzes can be found in *Course Schedule* .

Each quiz is only worth 10% of your final mark. Their primary purpose is to help you monitor your progress so that when you get to the final exam, you'll have a reasonable idea of where you're at. The other purpose is to help keep you on schedule, so you're not tempted to let yourself fall behind. The quizzes are intended to reward those who engage in the course and keep up to date. All quizzes will be conducted online on Moodle.

If you miss a quiz you will receive a mark of 0 for it. If you attempt a quiz you make yourself ineligible for special consideration. To be eligible for special consideration a valid special consideration request must be submitted before the start time of the quiz on or before the day of the quiz.

All the quizzes are entirely multiple choice. Each question will have only once correct answer; if unsure, choose the answer which you think is most correct. They may cover all material from the start of the course up to and including the time of the quiz (including material of the week of the quiz). Not all questions are of equal value; some questions may incur penalties for incorrect answers (see below).

To discourage random guessing in quizzes and the final exam, *some* answers to *some* questions may incur penalties for incorrect answers. That is, negative marks may apply to some questions if you choose the wrong answer. Questions with penalties will not be indicated, so you won't know to which questions a penalty will apply. For questions to which penalties apply, the penalty will be calculated so that the expected value will not exceed zero, but may be negative. For each assessment, fractional marks will be *rounded down* to the next lowest whole mark; that is, the fractional mark will be discarded.

You must complete each quiz by yourself. You are not allowed to cooperate or communicate with anyone else for the entire period that the quiz window is open. This means you must not use a phone or any other communications device (this includes a computer) and must not talk, text, message, email, etc., to/with anyone else. Communicating with others during this period is considered cheating and will incur severe penalties, which may include failing the course, or, if deemed serious enough, expulsion from the university.

You are not allowed to copy or reproduce an assessment task in any way (eg, taking photos, screenshots, and/or saving the html source). The IP for assessments is protected; copying and/or distributing an assessment task is stealing and will face serious penalties.

Grading

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

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

Watching the videos and working through the exercises should be enough to pass the course. Some of the assessment questions may cover material that hasn't been explicitly covered in the course material, or which anticipate topics covered more fully later. The expectation is that students who wish to achieve high grades will devote additional time reading outside of the course and reflecting on the course material in greater depth.

Special consideration

For information about special consideration and to submit a special consideration request, see UNSW's special consideration policy (https://student.unsw.edu.au/special-consideration) .

There will be no supplementary assessment for quizzes. If you miss a quiz you will receive 0 for that quiz unless you have been granted special consideration. Do not attempt a quiz if you are adversely affected by illness or misadventure; if you attempt a quiz you become ineligible for special consideration.

If you are granted special consideration for one or more quizzes, then at the end of the course your marks will be calculated as follows. If you have been granted special consideration for one quiz, the missed quiz mark will be replaced by your median mark in the other three quizzes. If you have been granted special consideration for two quizzes, your mark for *one* of the missed quizzes will be replaced by the minimum of the other two; the other missed quiz will receive 0. If you miss more than two quizzes, you will receive 0 marks for all the missed quizzes, regardless of special consideration; in this case you should seek advice from your student support service for options (eg, withdrawing from the course).

The *supplementary exam* is only for those who, due to circumstances beyond their control, were unable to complete the final exam, or who believe that their original mark was so affected 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 the 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 exam.

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 declaration . 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 ineligible.

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, see Plagiarism and Academic Integrity (https://student.unsw.edu.au/plagiarism) . Make sure that you read and understand these. Ignorance is not accepted as an excuse.

Resources for Students

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

The lectures are recorded and are available to students through Moodle. See the course menu on the left for a link to the Moodle site.

There is no prescribed textbook for the course. The materials provided are sufficient to prepare you for the assessment. 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.

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. I am constantly trying to improve it to meet the demands of online learning. I hope you enjoy it.

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Comments (/GSOE9210/21T3/forums/search?forum_choice=resource/66898) (/GSOE9210/21T3/forums/resource/66898)

There are no comments yet.