Course Outline

GSOE9210
Engineering Decision Methods
Semester 2 2014

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Course Staff

Contact Details

Staff Name	Role	Email	Phone
Victor Jauregui	Course Convenor	vicj at cse.unsw.edu.au	
Maurice Pagnucco	Lecturer	morri at cse.unsw.edu.au	56925

Consultations

Staff Name	Day/Time	Location
Victor Jauregui	Tuesday 1500-1700	K17-203
Victor Jauregui	Friday 1100-1300	K17-203

Course Details

Course Code: GSOE9210
Course Title: Engineering Decision Methods
Units of Credit: 6
Course WebSite: http://www.cse.unsw.edu.au/~gs9210/
Handbook Entry: http://www.handbook.unsw.edu.au/postgraduate/courses/2014/GSOE9210.html

Lectures

Classes are held between 3-6pm on Tuesdays, at Lecture Theatre M17 (ChemSc)

Classes start in Week 2, Term 2, 2014. There are classes in Weeks 2Â–13: Tuesday 29 July (first class) to Tuesday 29 October (last). One can add freely throughout Week 2; following that one needs an approval form (to be signed by the lecturer).

The supplementary exam is scheduled for Wednesday 10th December at 8:45am.

Course Summary

The topics covered include:

- Decision problems
- Decision problem representations: trees and tables
- Decisions under uncertainty: complete and partial knowledge
- Measuring uncertainty: probability
- Preference and utility
- Decisions involving others: games

Course Aims

The course is structured to support the vocational needs of future engineering graduates, with emphasis on problem solving in the types of decision-making situations that may be faced by postgraduates in their professional careers. Emphasis is on Â‘algorithmicityÂ’ - being able able to apply certain standard methods, inferences, procedures and formulae to the typical problems.

Student Learning Outcomes

Following completion of this course students should have developed an understanding of models and techniques to support decision making in complex environments.

Students will learn basic techniques required for formal reasoning, quantification of uncertainty, performance evaluation, and structuring of relationships and data.

General educational benefits

Extensive problem practice and opportunities for self-assessment enable building self-confidence in dealing with formalised problems and issues in engineering disciplines.

Examples drawn from a range of science and engineering applications emphasise the cross-disciplinary relevance of all the acquired learning. Formal reasoning and problem solving skills prepare the graduating students for further postgraduate science and engineering programs.

Assumed Knowledge

There are no formal prerequisites other than a general good background in logical reasoning. Several topics rely on the ability to perform computations involving probabilities, calculus or linear algebra. Any such computations will be discussed in class along with references, if warranted. Each class combines conceptual material with practical problem solving questions. All problems are related to the questions in the assessment tasks. This part of the class requires taking written notes. The posted solutions to tutorial problems are kept terse. Use of any recording devices is not allowed in the class.

Teaching Rationale

This course is taught by a combination of theory and practice. Each lecture combines an explanation of the relevant concepts combined with the practical solution to problems. In this way students are exposed to the required concepts and trained in their application.

Teaching Strategies

Lectures

They present the core material of all the topics, with strong emphasis on the applicability of the subject matter. At the same time they define the content of the course and the examinable material. All lectures emphasise the placement of the subject in the context of further courses, giving links to later applications.

Classroom practicum

Lectures also include practical problems and their solutions.

The practicum typically comprises practical exercises. They and their solutions are discussed in the class.

Individual consultation and tutoring

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https://www.cse.unsw.edu.au/db/DOdbs/Tutor/find/index.html
http://do.cse.unsw.edu.au/tutor/index.html
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Assessment

The final mark for the course is based on a mid-term paper and a final exam. The mid-term paper is worth 30% and the final exam is worth 70% of the final mark. The mid-term will be held in week seven (8) (September 16).

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

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

A supplementary exam is given only on the basis of a Â‘Consideration requestÂ’. Such a request must lodged (at Student Central) within three days of the exam. The supplementary exam is administered by the School of CSE.

The exam is comprehensive, based on the entire course material. It applies only to the Final exam; there is no Supplementary for any missed take-home tests.

Academic Honesty and Plagiarism

Plagiarism is defined as "using the words or ideas of others and presenting them as your own". UNSW and CSE treat 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
- MyUNSW: Plagiarism and Academic Misconduct
- CSE: Addendum to UNSW Plagiarism Guidelines
- CSE: Yellow Form (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 (12) weeks of classes. Each class will consist of a theoretical (lecture) and practical (tutorial) component. Tutorials will consist of exercise problems and solutions worked out during class. Written answers or solutions will also be provided.

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

Resources for Students

Materials are given a free access. No login is needed. They consist of class notes (and copies of the slides), tutorial problems and reference materials.

There is no textbook for the course and the posted materials are sufficient to prepare for the exams. A few supplementary textbooks will be placed on the Open Reserve in the Library of the UNSW.

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.
Staffin, P. *Game theory and strategy*. Mathematical Association of America, 1993.

Course Evaluation and Development

This course is evaluated each session using the CATEI system. Feedback from previous CATEI evaluations has been incorporated to ensure that lecture and tutorial materials are closely aligned to the assessment component of the course.