
SCSSE

**School of Computer Science and Software Engineering
Faculty of Informatics**

CSCI924 Reasoning and Learning Subject Outline Spring Session 2009

Head of School –Professor Willy Susilo, Student Resource Centre, Tel: (02) 4221 3606

GENERAL INFORMATION

Subject Coordinator

| | |
|-------------------|--------------------------------|
| Telephone Number: | Dr Jo Abrantes 02 4221 3872 |
| Email: | jo@uow.edu.au |
| Location: | 3.212 |

Dr Abrantes's consultation times during session:

| Day | Time |
|---------|---------------|
| Tuesday | 13.30 – 15.30 |
| Friday | 13.30 – 15.30 |

Subject Organisation

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|--|---|
| Session: | Spring Session, Wollongong Campus |
| Credit Points | 6 credit points |
| Contact hours per week: | 2 hours lectures, 1 hour lab/tutorial |
| Lecture Times & Location: | 8:30–10:30 Mon, 19.2114 |
| Tutorial Day, Time and Location can be found at: | http://www.uow.edu.au/student/timetables/index.html |

Students should check the subject's web site regularly as important information, including details of unavoidable changes in assessment requirements will be posted from time to time via e-Learning space <http://www.uow.edu.au/student/>. Any information posted to the web site is deemed to have been notified to all students.

Subject Description

This subject introduces students to the concepts of agents and heuristics used in intelligent reasoning and learning systems. Topics covered include multi-agent systems, agent safety, agent liveliness, computational heuristics, machine learning techniques, case based and other forms of knowledge reasoning, temporal reasoning, knowledge extraction, ontology and complexity. It examines software architectures and programming systems for implementing reasoning, learning, searching and modelling to solve intelligent systems' problems in the presence of incomplete information.

Subject Objectives

On successful completion of this subject, students should be able to:

1. choose an appropriate method to solve an intelligent systems problem
 2. design agent-based applications to solve complex problems
 3. apply agent algorithms to achieve robust reasoning and decision making
 4. understand complexity and how to deal with it using heuristic methods
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Graduate Qualities

This subject will continue to the following graduate qualities:

Informed
Independent Learners
Problem Solvers
Innovation & Design

Further information can be found at:

<http://www.uow.edu.au/informatics/scsse/current/SubjectInformation/UOW049401.html>

Attendance Requirements:

It is the responsibility of students to attend all lectures/tutorials/labs/seminars/ practical work for subjects for which you are enrolled. It should be noted that the amount of time spent on each 6 credit point subject should be at least 12 hours per week, which includes lectures/tutorials/labs etc.

Satisfactory attendance is deemed by the University, to be attendance at approximately 80% of the allocated contact hours.

Attendance rolls will be kept for lectures, tutorials and laboratories. If you are present for less than 80% and would have otherwise passed you need to apply for student academic consideration, otherwise a TF (technical fail) grade will be recorded.

Method of Presentation:

In order to maximize learning outcomes, it is strongly recommended that students attend all lectures and tutorials.

The introduction of each topic in the lectures will be followed by class discussion in which all students are expected to participate actively. Active participation implies that each student needs to at least either introduce a discussion point or offer an answer to a question.

In the tutorials students will have the opportunity to further discuss the topics introduced in the lectures. In addition, these tutorials will provide an opportunity for students to develop hands-on familiarity with a range of applications.

Lecture Schedule:

A proposed Lecture schedule for the subject is as follows:

| Week | Topic | Reading |
|------|---|------------------------|
| 1 | Introduction to Reasoning and Learning | Readings to be advised |
| 2 | Pattern Matching and Monotonic Inference | |
| 3 | Supervised Learning. Decision Trees | |
| 4 | Reinforcement Learning | |
| 5 | Reasoning under uncertainty | |
| 6 | Bayesian networks | |
| 7 | Markov Decision Processes | |
| 8 | Intelligent Agents | |
| 9 | Multi-Agent Systems | |
| 10 | Group Problem Solving (due to the Labour Day public holiday this lecture will be rescheduled to a time and venue to be advised) | |
| 11 | Student Presentations | |
| 12 | Student Presentations | |
| 13 | Revisions | |

Changes to the above schedule will be posted via e-Learning space <http://www.uow.edu.au/student/>. Any information posted to the web site is deemed to have been notified to all students.

Subject Materials:

Any readings/references are recommended only and are not intended to be an exhaustive list. Students are encouraged to use the library catalogue and databases to locate additional readings

Textbook(s):

There is no prescribed textbook for this subject, however the books listed below are highly recommended. Relevant research papers and other publications will be provided in class.

Other Resources:

- Russell & Norvig 2002. Artificial Intelligence: A Modern Approach, Prentice Hall. , 2nd edn.
- Sutton, R.S. and Barto, A.G. 1998. Reinforcement Learning: An Introduction, MIT Press
- Ethem A. 2004. Introduction to Machine Learning, MIT Press
- Wooldridge, M. 2002. An Introduction to Multiagent Systems, Wiley.
- Ferber, J. 1999. Multi-agent systems: an introduction to distributed artificial intelligence. Addison Wesley.
- Michalewicz, Z. and Fogel, D.B. 2004, How to solve it: modern heuristics, Springer, 2nd edn.

Assessment:

This subject has the following assessment components.

| ASSESSMENT ITEMS & FORMAT | % OF FINAL MARK | GROUP/ INDIVIDUAL | DUE DATE |
|--------------------------------------|-----------------|-----------------------------------|---|
| Assignment 1: programming assignment | 10% | Individual | Written report in week 3 during Lecture Presentations and program demonstrations in weeks 3 and 4. |
| Assignment 2: programming assignment | 10% | Individual | Written report in week 5 during Lecture Presentations and program demonstrations in weeks 5 and 6. |
| Assignment 3: programming assignment | 10% | Individual | Written report in week 7 during Lecture Presentations and program demonstrations in weeks 7 and 8. |
| Assignment 4: research report | 10% | Individual or group of 2 students | Written report in week 9 during Lecture Presentations in weeks 9 and 10. |
| Final Report and Presentation | 20% | Individual | Final Report in week 13 during Lecture Presentations in weeks 11 and 12. |
| Final Examination | 40% | Individual | Examination Period |

Notes on Assessment:

All assignments are expected to be completed independently. Plagiarism may result in a FAIL grade being recorded for that assignment.

To pass this subject a student must achieve a mark of at least **40%** in the final exam. Students who fail to achieve this minimum mark and would have otherwise passed will be given a TF (Technical Fail) grade for this subject.

Electronic Submission of Assessment Items:

Unless otherwise notified by the subject coordinator, all written assignments must be submitted electronically.

To pass this subject a student must achieve a mark of at least **40%** in the final exam. Students who fail to achieve this minimum mark and would have otherwise passed will be given a TF (Technical Fail) grade for this subject.

Submission of assessment items via email will not be accepted.

Other Procedures for the submission of assessment items:

Students will be required to produce assignment work in the form of reports and working programs which will be respectively presented and demonstrated in class. Details of individual assignments and Final Report will be given in the lectures.

Assignments will be assessed in class on the basis of presentations and program demonstrations (as applicable) given by students. As such, there will not normally be an opportunity for late submission. In the event of a reasonable case for student academic consideration being presented, late submission and assessment of work may be allowed. As a result, late penalties will not apply in the usual manner.

Procedures for the return of assessment items:

All assignments will be returned during the tutorial class within 2 weeks of their submission.

Penalties for late submission of assessment items:

As indicated above no late submission will be accepted, except if student academic consideration has been granted.

Tutorial/Lab Closure Policy

If for any reason, the number of students in a tutorial or lab falls below a sustainable enrolment level, as determined by the Head of School, tutorials/labs offered for that subject may be collapsed or deleted.

You will have to attend the new tutorials/lab if this closure affects the one you are attending.

We will endeavour to make this decision no later than Week 4 of session.

Supplementary Exams

Supplementary Exams will be dealt with in accordance with student academic consideration policy (<http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf>) 9.2 Timing of Supplementary Exams.

While the School normally grants supplementary exams when the student does not sit the standard exam for an acceptable reason, each case will be assessed on its own merit and there is no guarantee a supplementary exam will be granted. If a supplementary exam is granted, you will normally be notified via SOLS Mail the time and date of this supplementary exam. You must follow the instructions given in the email message.

Please note that if this is your last session and you are granted a supplementary exam, be aware that your results will not be processed in time to meet the graduation deadline.

Student Academic Consideration Policy

The School recognises that it has a responsibility to ensure equity and consistency across its subjects for all students. Sometimes, in exceptional circumstances, students need to apply for student academic consideration in order to complete all assessable work.

The University applies strict criteria to the granting of student academic consideration. Before applying for student academic consideration, students should carefully read the University's policy which can be found at: <http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf>.

Plagiarism

When you submit an assessment task, you are declaring the following

1. It is your own work and you did not collaborate with or copy from others.
2. You have read and understand your responsibilities under the University of Wollongong's policy on plagiarism.
3. You have not plagiarised from published work (including the internet). Where you have used the work from others, you have referenced it in the text and provided a reference list at the end of the assignment.

Students must remember that:

Plagiarism will not be tolerated.

Students are responsible for submitting original work for assessment, without plagiarising or cheating, abiding by the University's policies on Plagiarism as set out in the University Handbook under University Policy Directory and in Faculty handbooks and subject guides. Plagiarism has led to the expulsion from the University.

Student Academic Grievance Policy

The School aims to provide a fair, equitable and productive learning environment for all its students. The Student Academic Grievance Policy seeks to support the achievement of this goal by providing a transparent and consistent process for resolving student academic grievances.

Any student who has a grievance over a result should obtain a Faculty of Informatics Appeal Against Decision or Action Affecting Academic Experience form from the Informatics Student Enquiry Centre. (<http://www.uow.edu.au/content/groups/public/@web/@inf/@faculty/documents/doc/uow017433.pdf>) The student should firstly take the form to the marker/lecturer to discuss the matter and, if the student is still not satisfied, s/he should take the next step as outlined on the form.

Once the grievance has been considered by the Faculty, if the student still feels the situation has not been fully resolved s/he may consult the Dean of Students. However, the Dean of Students can have no input into the academic judgment of the lecturer and can only review the grievance to ensure proper procedure has been followed.

Relevant University Policies, procedures and students services:

For more information students must refer to the Faculty handbook, online references or consult the UOW policy in full at <http://www.uow.edu.au/handbook/courserules/studacgrievpol.html> which contains a range of policies on educational issues and student matters.

This subject outline can be found at: <http://www.uow.edu.au/informatics/scsse/current>

This outline should be read in conjunction with the following documents:

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| Code of Practice - Teaching and Assessment http://www.uow.edu.au/handbook/codesofprac/teaching_code.pdf | Code of Practice - Students http://www.uow.edu.au/handbook/codesofprac/cop_students.html |
| Code of Practice-Honours http://www.uow.edu.au/handbook/CodeofPractice-Honours.pdf | Acknowledgement Practice Plagiarism will not be tolerated: http://www.uow.edu.au/handbook/courserules/plagiarism.html |
| Key Dates http://www.uow.edu.au/student/dates.html | Student Academic Consideration Policy: http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf |
| Course Progress Requirements: http://www.uow.edu.au/student/mrp/index.html | Graduate Qualities Policy: http://www.uow.edu.au/about/teaching/qualities/index.html#_The new UOW |
| Academic Grievance Policy (Coursework and honours students) http://www.uow.edu.au/handbook/courserules/studacgrievpol.html | Non-Discriminatory Language Practice and Presentation http://staff.uow.edu.au/eed/nondiscrimlanguage.html |
| Occupational Health and Safety http://staff.uow.edu.au/ohs/commitment/ohspolicy/index.html | Ownership of Work & Intellectual Property Policy: http://www.uow.edu.au/handbook/generalcourserules/UOW028651.html |
| Human Research Ethics Committee: http://www.uow.edu.au/research/rso/ethics/human/ | Rules for student conduct: http://www.uow.edu.au/handbook/generalrules/StudentConductRules.pdf |
| Independent Learners' Introductory Program http://www.uow.edu.au/student/attributes/ilip/ | Informatics Faculty Librarian, Ms Annette Meldrum, phone: 4221 4637, email: ameldrum@uow.edu.au |
| Student Support Services: http://www.uow.edu.au/student/services/ Informatics Faculty SEDLO (Student Equity and Diversity Liaison Officers) Virginie Schmelitschek, phone 4221 3833, virginie@uow.edu.au | SCSSE Internet Access & Student Resource Centre http://www.uow.edu.au/informatics/common/uow024466.html |
| SCSSE Computer Usage Rules http://www.uow.edu.au/informatics/common/uow024457.html | SCSSE Subject Outlines http://www.uow.edu.au/informatics/scsse/current |