UNIVERSITY OF WOLLONGONG AUSTRALIA

SCIT

School of Computing and Information Technology

Faculty of Engineering & Information Sciences

Head of School Professor Willy Susilo

EIS Central

Tel: (02) 4221 3491

CSCI924 Reasoning and Learning

Subject Outline

Spring Session 2018

Consultation Times

Subject Coordinator	Professor Philip Ogunbona
Telephone Number:	4221 5321
Email:	philipo @uow.edu.au
Location:	3.113

Professor Ogunbona's consultation times during session:

Day	Time
Monday	10:30 - 12:30
Thursday	13:30 - 15:30

Subject Organisation

Session:	Spring Session 2018, Wollongong Campus
Credit Points	6 credit points
Contact hours per week:	2hrs lecture, 1 hr tutorial
Lecture Times & Location:	http://www.uow.edu.au/student/timetables/index.html
Tutorial Day, Time and Location can be found at:	http://www.uow.edu.au/student/timetables/index.html

The University uses the eLearning system Moodle to support all coursework subjects.

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

In extraordinary circumstances the provisions stipulated in this Subject Outline may require amendment after the Subject Outline has been distributed. All students enrolled in the subject must be notified and have the opportunity to provide feedback in relation to the proposed amendment, prior to the amendment being finalised.

Data on student performance and engagement (such as Moodle and University Library usage, task marks, use of SOLS) will be available to the Subject Coordinator to assist in analysing student engagement, and to identify and recommend support to students who may be at risk of failure. If you have questions about the kinds of data the University uses, how we collect it, and how we protect your privacy in the use of this data, please refer to http://www.uow.edu.au/dvca/bala/analytics/index.html

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 Learning Outcomes

On successful completion of this subject, students will 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.

Recent Improvements

The School is committed to continual improvement in teaching and learning and takes into consideration student feedback from many sources. These sources include direct student feedback to tutors and lecturers, feedback through Student Services and the Faculty Central, and responses to the Subject Evaluation Surveys. This information is also used to inform comprehensive reviews of subjects and courses.

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.

Optional Attendence Statement

Attendance rolls may be kept for lectures and tutorials. 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 may be recorded. Students MUST attend their allocated tutorial unless they have the written permission of the subject coordinator.

Method of Presentation

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

Lecture Schedule

Week	Topic
1	Introduction to Reasoning and Learning
2	Problem solving approaches
3	Decision Tree
4	Markov Decision Processes
5	Reinforcement Learning (1)
6	Reinforcement Learning (2)
7	Bayesian networks (1)
8	Bayesian networks (2)
9	Agent Architectures and Practical Reasoning
10	Multi-Agent systems and Group Problem Solving
11	Game Theory (1)
12	Game Theroy (2)
13	Revisions

UOW Grade Descriptors

GRADE	DESCRIPTOR
High Distinction(HD) 85-100%	For performance that provides evidence of an outstanding level of attainment of thelearning relevant subject outcomes, demonstrating the attributes of a distinction grade plus (as applicable) one or more of the following: • consistent evidence of deep and critical understanding • substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem-solving approaches • critical evaluation of problems, their solutions and their implications • use of quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work • creativity in application as appropriate to the discipline • eloquent and sophisticated communication of information and ideas in terms of the conventions of the discipline • consistent application of appropriate skills, techniques and methods with outstanding levels of precision and accuracy • all or almost all answers correct, very few or none incorrect
Distinction (D) 75-84%	For performance that provides evidence of a superior level of attainment of the relevant subject learning outcomes, demonstrating the attributes of a credit grade plus (as applicable) one or more of the following: • evidence of integration and evaluation of critical ideas, principles, concepts and/or theories • distinctive insight and ability in applying relevant skills, techniques, methods and/or concepts • demonstration of frequent originality in defining and analysing issues or problems and providing solutions • fluent and thorough communication of information and ideas in terms of the conventions of the discipline • frequent application of appropriate skills, techniques and methods with superior levels of precision and accuracy • most answers correct, few incorrect
Credit (C) 65-74%	For performance that provides evidence of a high level of attainment of the relevant subject learning outcomes, demonstrating the attributes of a pass grade plus (as applicable) one or more of the following: • evidence of learning that goes beyond replication of content knowledge or skills • demonstration of solid understanding of fundamental concepts in the field of study • demonstration of the ability to apply these concepts in a variety of contexts • use of convincing arguments with appropriate coherent and logical reasoning • clear communication of information and ideas in terms of the conventions of the discipline • regular application of appropriate skills, techniques and methods with high levels of precision and accuracy • many answers correct, some incorrect
Pass (P) 50-64%	For performance that provides evidence of a satisfactory level attainment of the relevant subject learning outcomes, demonstrating (as applicable) one or more of the following: • knowledge, understanding and application of fundamental concepts of the field of study • use of routine arguments with acceptable reasoning • adequate communication of information and ideas in terms of the conventions of the discipline • ability to apply appropriate skills, techniques and methods with satisfactory levels of precision and accuracy • a combination of correct and incorrect answers
Fail (F) <50%	For performance that does not provide sufficient evidence of attainment of the relevant subject learning outcomes.
Technical Fail (TF)	When minimum performance level requirements for at least one assessment item in the subject as a whole has not been met despite the student achieving at least a satisfactory level of attainment of the subject learning outcomes.

http://www.uow.edu.au/curriculum-transformation/aqc/uowgradedescriptors/...

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 are no text books for this subject – relevant papers and other publications will be provided in class.

A good starting point for your reading can be found in the following:

- 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	SUBJECT LEARNING OUTCOMES	CRITERIA TO ASSESS ITEM
Assignment 1	5	Individual	Week 4	1,4	1. Correctness of code 2. Quality of code 3. Documentation
Assignment 2	15	Individual	Week 7	1,2,3,4	1. Correctness of code 2. Quality of code 3. Documentation
Research Report	20	Work in small groups	Week 12	1,2,3,4	1. Quality of report - use of English 2. Quality of report - technical content 3. Quality and correctness of bibliography
Presentation	10	Work in small groups	To be held in the tutorial class from Week 3 to Week 12 The detail arrangement will be based on the student number in the class	1,2,3,4	1. Quality of presentation - comprehensible and good organization 2. Time (being on time) 3. Technical content 4. Ability to answer questions from class
Examination	50	Individual	Examination Period	1,2,3,4	Correctness of answers

Notes on Assessment

All assignments are expected to be completed independently. Proven plagiarism may result in a FAIL gradebeing recorded for the assignment in question.

Method for Submission of Assessment Items

All must be submitted via Moodle. Assignments submitted through email to the Lecturer will be deemed not to have been submitted

Arrangement for acknowledging submission of written work

All assignmnents submitted through Moodle are self acknowledging.

Procedure for the return of assessment items

Marked assignments will be emailed to individual students via Moodle.

Procedure for the retention of assessed work

The University may retain copies of student work in order to facilitate quality assurance of assessment processes, in support of the continuous improvement of assessment design, assessment marking and for the review of the subject. The University retains records of students' academic work in accordance with the University Records Management Policy and the State Records Act 1988 and uses these records in accordance with the University Privacy Policy and the Privacy and Personal Information Protection Act 1998.

Formative feedback given to student prior census date consists of the following

Assignment 1 will be marked and returned to students before census date.

Assessment General

Students are required to submit assignments electronically via the subject's Moodle site unless indicated otherwise.

Submission of assessments items via email will not be accepted.

Student contributions to tutorial and/or seminars

Students are expected to be active participants in every class, tutorial and the presentations in order to maximize their learning experience.
No specific marks are awarded for participation.

Marks in this subject are not routinely scaled

For more information refer to Standards for Finalisation of Student Results: http://www.uow.edu.au/about/policy/UOW039331.html

Assessment task is set up to be checked by Turnitin

- This subject does not use Turnitin.

Assessment Quality Cycle

The University of Wollongong is committed to the quality assurance and quality enhancement of assessment. The University will meet its legislative and regulatory obligations, to ensure consistent and appropriate assessment through course management and coordination, including assessment quality assurance procedures. An Assessment Quality Cycle is used to describe quality assurance at the points of assessment design, assessment delivery, the declaration of marks and grades, and review and improvement activities.

Referencing System

The Author-Date (Harvard) referencing system is the University's default referencing system to be used in the the reports submitted for this subject. Refer to the Library Referencing and Citing link given below:
http://www.library.uow.edu.au/content/groups/public/@web/@lib/documents/doc/uow220276.pdf

Internet Resources

Applicable useful resources available from the world wide web will be brought to the attention of students throughout the course.

Technical Fail

To be eligible for a Pass in this subject a student must achieve a mark of at least 40% in Assignment 2 and Research Report respectively. Students who fail to achieve this minimum mark & would have otherwise passed may be given a TF (Technical Fail) for this subject.

All assessment tasks must be submitted. Students who do not meet the minimum performance requirements, as specified for each assessment, will receive a TF (Technical Fail) grade for this subject, which will appear on your Academic Transcript.

Supplementary Exams

1. A student whose overall performance results in a TF will only be granted a supplementary assessment task (e.g. a supplementary exam or a supplementary assignment) if approved by the school assessment committee.
2. A student who achieves a mark of 48-49% will normally be eligible for a grade of WS and a supplementary exam organised by the University. In this case, the maximum grade attainable is PS (Pass Supplementary) and a mark of 50%.
3. A student who has successfully applied for academic consideration will receive either:
    a. A WD - Withheld Deferred Exam - and be allowed to sit only a supplementary exam, which will be supervised by the University or
    b. A WH – Withheld – and be allowed to sit a supplementary exam not supervised by the University or complete some other supplementary task
4. If a student is being investigated for misconduct and the investigation cannot be completed before the grades are released the student will receive a grade of WH until a mark is declared.
5. Calculators will be allowed in the final exam.

Penalties for late submission of assessment items

Penalties apply to all late work, except if student academic consideration has been granted. Late submissions will attract a penalty of 25% of the assessment mark per day. This amount is per day or parts thereof including weekends and public holidays. Work more than (3) days late will be awarded a mark of zero.

Extensions

Extensions of time to submit material for assessment can only be requested in advance of the due date for an assessment activity through the Academic Consideration process on SOLS. For more information please refer to the Student Academic Consideration Policy at: http://www.uow.edu.au/about/policy/UOW058721.html

Reasonable Adjustment to Assessment

A student with a disability may be entitled to reasonable adjustment to assessment.

A reasonable adjustment document is a recommendation that needs to be discussed and ratified by subject coordinators. Normal subject assessment requirements can only be adjusted with explicit written permission of the subject coordinator. In particular students cannot assume that a reasonable adjustment document bestows a right to deferred or supplementary exams.

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.

Exams

Exams will be run in accordance with UOW Exam rules, please refer to changes to exams and grades at:
http://www.uow.edu.au/student/exams/UOW115867.html

Supplementary Assessment

In most circumstances the School does not offer a supplementary & deferred exam to a student who has sat a scheduled exam.

Supplementary & Deferred Exams will be dealt with in accordance with student academic consideration policy (http://www.uow.edu.au/about/policy/UOW060110.html) 9.2 Timing of Supplementary Exams.

Supplementary assessment may be offered to students whose performance in this subject is close to that required to pass the subject, and are otherwise identified as meriting an offer of a supplementary assessment. The Subject Coordinator will determine the precise form of supplementary assessment at the time the offer of a supplementary is made. In some circumstances you may be offered a supplementary exam. For more information about Supplementary Exams refer to:
http://www.uow.edu.au/student/exams/aboutsupp/index.html

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.

If you believe that your submission of, performance in or attendance at an assessment activity, including an examination, has been affected on compassionate grounds, by illness or by other serious extenuating circumstances beyond your control, you can apply for academic consideration in Student OnLine Services (SOLS). Do not assume that an application for academic consideration will be automatically granted. For more information please refer to the Student Academic Consideration Policy at:
http://www.uow.edu.au/about/policy/UOW058721.html

In some circumstances you may be offered a deferred exam. For more information about Deferred and Supplementary Exams refer to: http://www.uow.edu.au/student/exams/aboutsupp/index.html

Plagiarism - University's Academic Integrity Policy

The University's policy on acknowledgement practice and plagiarism provides detailed information about how to acknowledge the work of others: http://www.uow.edu.au/about/policy/UOW058648.html

The University's Academic Integrity Policy, Faculty Handbooks and subject guides clearly set out the University's expectation that students submit only their own original work for assessment and avoid plagiarising the work of others or cheating. Re-using any of your own work (either in part or in full) which you have submitted previously for assessment is not permitted without appropriate acknowledgement or without the explicit permission of the Subject Coordinator. Plagiarism can be detected and has led to students being expelled from the University.

The use by students of any website that provides access to essays or other assessment items (sometimes marketed as 'resources'), is extremely unwise. Students who provide an assessment item (or provide access to an assessment item) to others, either directly or indirectly (for example by uploading an assessment item to a website) are considered by the University to be intentionally or recklessly helping other students to cheat. Uploading an assessment task, subject outline or other course materials without express permission of the university is considered academic misconduct and students place themselves at risk of being expelled from the University.

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 Academic Integrity 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 to 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 Academic Integrity Policy as set out in the University Handbook, the University's online Policy Directory and in Faculty handbooks and subject guides.

Student Academic Complaints Policy (Coursework or Higher Degree Research)

In accordance with the Coursework Student Academic Complaints Policy, a student may request an explanation of a mark for an assessment task or a final grade for a subject consistent with the student's right to appropriate and useful feedback on their performance in an assessment task. Refer to the Coursework Student Academic Complaints Policy for further information http://www.uow.edu.au/about/policy/UOW058653.html

Any student who has a complaint over a result should obtain a Faculty of Engineering and Information Sciences Coursework Student Academic Review/Complaint form (http://www.uow.edu.au/student/complaints/UOW008298.html) from the EIS Central. 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 complaint has been considered by the Faculty, if the student still feels the situation has not been fully resolved s/he may refer the matter to the Student Ombudsman.

Relevant University Policies, procedures and students services

For more information students must refer to the Course Handbook, relevant online references or consult the UOW General Course Rules in full http://www.uow.edu.au/about/policy/UOW058680.html which contains a range of policies on educational issues and student matters.

Library Services

To save yourself time and enhance your studies: connect with information specialists and resources anytime, anywhere via Ask Us: http://www.library.uow.edu.au/ask/UOW026599.html or *Google* "UOW library ask us"

Online – Ask a Librarian	Ask questions and receive a response within 1 business day
In person – Book a Librarian	30-minute appointment with an Librarian
Research Consultation Service	1 hour appointment with an information specialist. Available to UOW academics, HDRs, Postgraduate Coursework, Honours and Masters students.
By phone	+61 2 4221 3548

The Main Library (Building 16) and Education Curriculum Resources Centre (Building 22) are located at the Wollongong Campus. UOW Libraries at other locations are listed on the Library website.

This outline should be read in conjunction with the following:

Teaching and Assessment: Code of Practice - Teaching - http://www.uow.edu.au/about/policy/UOW058666.html Teaching and Assessment: Assessment and Feedback Policy - http://www.uow.edu.au/about/policy/alphalisting/UOW222905.html Teaching and Assessment: Subject Delivery Policy - http://www.uow.edu.au/about/policy/alphalisting/UOW222906.html
Key Dates: http://www.uow.edu.au/student/dates/index.html
Course Progress Policy: http://www.uow.edu.au/about/policy/UOW058679.html
Coursework Student Academic Complaints Policy: (Coursework and honours students): http://www.uow.edu.au/about/policy/UOW058653.html
Student Charter: www.uow.edu.au/student/charter/
Work Health & Safety Policy: http://www.uow.edu.au/about/policy/UOW016894.html
Human Research Ethics Guidelines: http://www.uow.edu.au/research/ethics/human/index.html
Sudent Support: EIS Central Building 4, Ground Floor, Phone: 4221 3491, Email: eis@uow.edu.au Faculty of Engineering & Information Sciences current students website: http://eis.uow.edu.au/current-students/
Student Support Adviser (SSA): https://www.uow.edu.au/student/services/SSA/contact/index.html Faculty SEDLO (Student Support & Peer Learning Officer): Building 4 Room 105 Phone 4221 3833 Mitz Perez - Mon -Tue -Wed, mitz-perez@uow.edu.au Danial Morgan - Thu and Fri, danial_morgan@uow.edu.au
Information Technology Services and Policies: http://www.uow.edu.au/its/accounts/index.html
Student Representatives: http://eis.uow.edu.au/current-students/get-involved/studentreps/index.html
Academic Integrity Policy: http://www.uow.edu.au/about/policy/UOW058648.html
Student Academic Consideration Policy: http://www.uow.edu.au/about/policy/UOW058721.html
Student Conduct Rules and Accompanying Procedures: http://www.uow.edu.au/about/policy/UOW058723.html
Code of Practice - Research: http://www.uow.edu.au/about/policy/UOW058663.html
Code of Practice – Student Professional Experience: http://www.uow.edu.au/about/policy/UOW058662
Code of Practice - Honours: http://www.uow.edu.au/about/policy/UOW058661.html

Intellectual Property (IP) Policy: http://www.uow.edu.au/about/policy/UOW058689.html
Research Misconduct Policy: http://www.uow.edu.au/about/policy/UOW058715.html
Inclusive Language Guidelines: http://www.uow.edu.au/student/honours/rules/cops/UOW140611.html
Ownership of Work & Intellectual Property Policy: http://www.uow.edu.au/handbook/generalcourserules/UOW028651.html
Netiquette Guide: http://www.uow.edu.au/student/elearning/netiquette/index.html
Library Services: http://www.library.uow.edu.au Building 16, Phone: 4221 3548 Complete Start Smart: http://www.uow.edu.au/student/services/fye/resources/startsmart / Copyright Policy: http://www.library.uow.edu.au/copyright/policies/UOW026670.html
Subject Outlines: https://ssl.informatics.uow.edu.au/subjectoutlines/Current/