



MONASH University
Information Technology

FIT3080
Intelligent systems

Unit Guide

Semester 2, 2011

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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FIT3080 Intelligent systems - Semester 2, 2011

This unit includes history and philosophy of artificial intelligence; intelligent agents; problem solving and search (problem representation, heuristic search, iterative improvement, game playing); knowledge representation and reasoning (extension of material on propositional and first-order logic for artificial intelligence applications, situation calculus, planning, frames and semantic networks); expert systems overview (production systems, certainty factors); reasoning under uncertainty (belief networks compared to other approaches such as fuzzy logic); machine learning (decision trees, neural networks, genetic algorithms).

Mode of Delivery

Clayton (Day)

Contact Hours

2 hrs lectures/wk, 1 hr laboratory/wk

Workload

The expected weekly workload is 12 hours in total, including:

- 2 hour lecture
- 1 hour tutorial and
- 9 hours for personal study including programming, reading and revision.

Unit Relationships

Prohibitions

CSE2309, CSE3309, DGS3691

Prerequisites

FIT2004 or CSE2304

Chief Examiner

Dr Kevin Korb

Campus Lecturer

Clayton

Kevin Korb

Contact hours: Monday 3pm - 4pm; Thursday 3pm - 4pm

Academic Overview

Learning Objectives

At the completion of this unit students will have -
A knowledge and understanding of:

- the historical and conceptual development of AI;
- the goals of AI and the main paradigms for achieving them including logical inference, search, nonmonotonic logics, neural network methods and Bayesian inference;
- the social and economic roles of AI;
- heuristic AI for problem solving;
- basic knowledge representation and reasoning mechanisms;
- automated planning and decision-making systems;
- probabilistic inference for reasoning under uncertainty;
- machine learning techniques and their uses;
- foundational issues for AI, including the frame problem and the Turing test;
- AI programming techniques.

Developed attitudes that enable them to:

- appreciate the potential and limits of the main approaches to AI;
- be ready to reason critically about claims of the effectiveness of AI programs;
- analyse problems and determine where AI techniques are applicable;
- implement AI problem-solving techniques in Lisp;
- compare AI techniques in terms of complexity, soundness and completeness.

Graduate Attributes

Monash prepares its graduates to be:

1. responsible and effective global citizens who:

- a. engage in an internationalised world
- b. exhibit cross-cultural competence
- c. demonstrate ethical values

critical and creative scholars who:

- a. produce innovative solutions to problems
- b. apply research skills to a range of challenges
- c. communicate perceptively and effectively

Assessment Summary

Examination (3 hours): 60%; In-semester assessment: 40%

Assessment Task	Value	Due Date
Assignment 1 - Lisp exercises	10%	19 August 2011

Academic Overview

Assignment 2 - Search and/or game playing program	15%	9 September 2011
Assignment 3 - Learning and decision-making program	15%	21 October 2011
Examination 1	60%	To be advised

Teaching Approach

Lecture and tutorials or problem classes

This teaching and learning approach provides facilitated learning, practical exploration and peer learning.

Feedback

Our feedback to You

Types of feedback you can expect to receive in this unit are:

- Informal feedback on progress in labs/tutes
- Graded assignments without comments
- Solutions to tutes, labs and assignments

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through SETU, Student Evaluation of Teacher and Unit. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, and on student evaluations, see:

<http://www.monash.edu.au/about/monash-directions/directions.html>

<http://www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html>

Previous Student Evaluations of this unit

If you wish to view how previous students rated this unit, please go to

<https://emuapps.monash.edu.au/unitevaluations/index.jsp>

Required Resources

Required Texts:

- R. Russell and P. Norvig (2010). Artificial Intelligence: A Modern Approach, 3rd edition. Prentice Hall.
- P. Graham (1996), ANSI Common Lisp. Prentice Hall.

Software:

Academic Overview

- Lisp (available for student use in computer labs).

Unit Schedule

Week	Activities	Assessment
0		No formal assessment or activities are undertaken in week 0
1	Introduction	
2	Lisp	
3	Search	
4	Search and Games	Assignment 1 due 19 August 2011
5	Lisp II	
6	Logic	
7	Defeasible Reasoning	Assignment 2 due 9 September 2011
8	Planning	
9	Bayesian Networks	
10	Machine Learning	
11	ANNs and Evolutionary Learning	
12	Bayesian Learning	Assignment 3 due 21 October 2011
	SWOT VAC	No formal assessment is undertaken SWOT VAC
	Examination period	LINK to Assessment Policy: http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html

*Unit Schedule details will be maintained and communicated to you via your MUSO (Blackboard or Moodle) learning system.

Assessment Requirements

Assessment Policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 50% then a mark of no greater than 49-N will be recorded for the unit

Assessment Tasks

Participation

• Assessment task 1

Title:

Assignment 1 - Lisp exercises

Description:

Individual programming exercises in Lisp.

Weighting:

10%

Criteria for assessment:

Completion of lisp exercises. The specific tasks and marking criteria will be distributed at the appropriate time during the semester.

Due date:

19 August 2011

• Assessment task 2

Title:

Assignment 2 - Search and/or game playing program

Description:

A student-written lisp program to search and/or play a game.

Weighting:

15%

Criteria for assessment:

Performance of program. The specific tasks and marking criteria will be distributed at the appropriate time during the semester.

Due date:

9 September 2011

• Assessment task 3

Title:

Assignment 3 - Learning and decision-making program

Description:

Assessment Requirements

A student-written lisp program that demonstrates machine learning and/or the ability to make rational decisions.

Weighting:

15%

Criteria for assessment:

Performance of program. The specific tasks and marking criteria will be distributed at the appropriate time during the semester.

Due date:

21 October 2011

Examinations

- **Examination 1**

Weighting:

60%

Length:

3 hours

Type (open/closed book):

Closed book

Electronic devices allowed in the exam:

None

Remarks:

Sample exams will be made available.

Assignment submission

It is a University requirement

(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-procedures.html>) for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at <http://www.infotech.monash.edu.au/resources/student/forms/>. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an online quiz).

Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process:

<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>.

Returning assignments

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later

Other Information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:

<http://policy.monash.edu.au/policy-bank/academic/education/index.html>

Key educational policies include:

- Plagiarism
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html>)
- Assessment
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-p>)
- Special Consideration
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.h>)
- Grading Scale
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html>)
- Discipline: Student Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html>)
- Academic Calendar and Semesters (<http://www.monash.edu.au/students/key-dates/>);
- Orientation and Transition (<http://www.infotech.monash.edu.au/resources/student/orientation/>);
and
- Academic and Administrative Complaints and Grievances Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy>)
- Codes of Practice for Teaching and Learning
(<http://www.policy.monash.edu.au/policy-bank/academic/education/conduct/suppdocs/code-of-practice-tea>)

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at www.monash.edu.au/students. The Monash University Library provides a range of services and resources that enable you to save time and be more effective in your learning and research. Go to <http://www.lib.monash.edu.au> or the library tab in my.monash portal for more information. Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis

- Website: <http://adm.monash.edu/sss/equity-diversity/disability-liaison/index.html>;
- Telephone: 03 9905 5704 to book an appointment with a DLO;
- Email: dlu@monash.edu
- Drop In: Equity and Diversity Centre, Level 1 Gallery Building (Building 55), Monash University, Clayton Campus.

Reading list

Required Texts:

- R. Russell and P. Norvig (2010). Artificial Intelligence: A Modern Approach, 3rd edition. Prentice Hall.
- P. Graham (1996), ANSI Common Lisp. Prentice Hall.

Other Information

Recommended Texts:

- A Hodges (1992), Alan Turing: The Enigma. London: Vintage.
- P McCorduck (1979), Machines Who Think. Freeman.
- J Haugland (1985), Artificial Intelligence: The Very Idea. MIT.
- M Boden (Ed.) (1990), The Philosophy of AI. Oxford.