MONASH University

FIT5047
Intelligent systems

Unit guide

Semester 1, 2009

Last updated : 05 Feb 2009

Table of Contents

FIT5047 Intelligent systems - Semester 1, 2009

Unit leader :

Ingrid Zukerman

Lecturer(s) :

Caulfield

- Ingrid Zukerman
- Oshadi Alahakoon

Introduction

Unit synopsis

This is the foundation unit for the Intelligent Systems specialisation. It introduces the main problems and approaches to designing intelligent software systems including automated search methods, reasoning under uncertainty, planning, software agents, recommender systems, machine learning paradigms, natural language processing, user modelling and evolutionary algorithms.

Learning outcomes

At the completion of this unit student will:

1. Have knowledge of the applications of intelligent software systems in the domains of Pervasive Computing, Web Services and Business Intelligence;
2. Be familiar with the principles and theoretical underpinning of intelligent software systems;
3. Understand models and approaches to building intelligent software systems;
4. Understand different software toolkits and development environments;
5. Have an understanding of current research trends in the field;
6. Critically and independently analyse how intelligent techniques can be used to enhance software applications and the development of smart environments;
7. Be able to design and develop intelligent applications particularly in the domains of Web Services and Business Intelligence.
8. Be able to select and apply appropriate tools for a particular application.

Workload

For on campus students, workload commitments are:

- two-hour lecture
- two-hour tutorial (requiring advance preparation)
- a minimum of 3 hours of personal study per week

Unit relationships

Prerequisites

- Programming in Java
- Fundamental math with introductory knowledge of probability

Relationships

You may not study this unit and CSE3309 in your degree or previous Monash degrees.

Continuous improvement

Monash is committed to 'Excellence in education' (Monash Directions 2025 - http://www.monash.edu.au/about/monash-directions/directions.html) and strives for the highest possible quality in teaching and learning.

To monitor how successful we are in providing quality teaching and learning Monash regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through Unit Evaluation Surveys. The University's Unit Evaluation policy (http://www.policy.monash.edu/policy-bank/academic/education/quality/unit-evaluation-policy.html) requires that every unit offered is evaluated each year. Students are strongly encouraged to complete the surveys as they are an important avenue for students to "have their say". The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

Faculties have the option of administering the Unit Evaluation survey online through the my.monash portal or in class. Lecturers will inform students of the method being used for this unit towards the end of the semester.

Student Evaluations

If you wish to view how previous students rated this unit, please go to http://www.monash.edu.au/unit-evaluation-reports/

Improvements to this unit

Assessment weight has been changed due to students' feedback.

Unit staff - contact details

Unit leader

Professor Ingrid Zukerman
Professor
Phone +61 3 990 55202
Fax +61 3 990 55157

Lecturer(s) :

Professor Ingrid Zukerman
Professor
Phone +61 3 990 55202
Fax +61 3 990 55157
Ms Oshadi Alahakoon

Additional communication information

Ingrid Zukerman

Building 63, room 213, Clayton

9905 5202

Oshadi Alahakoon

Building H, room 7-13, Caulfield

9903 1982

Teaching and learning method

Communication, participation and feedback

Monash aims to provide a learning environment in which students receive a range of ongoing feedback throughout their studies. You will receive feedback on your work and progress in this unit. This may take the form of group feedback, individual feedback, peer feedback, self-comparison, verbal and written feedback, discussions (on line and in class) as well as more formal feedback related to assignment marks and grades. You are encouraged to draw on a variety of feedback to enhance your learning.

It is essential that you take action immediately if you realise that you have a problem that is affecting your study. Semesters are short, so we can help you best if you let us know as soon as problems arise. Regardless of whether the problem is related directly to your progress in the unit, if it is likely to interfere with your progress you should discuss it with your lecturer or a Community Service counsellor as soon as possible.

Unit Schedule

Week	Topic	Key dates
1	Introduction	
2	Problem solving as search	
3	Knowledge representation	
4	Planning	
5	Software Agents	
6	Agent Applications	Assignment 1 due April 6
Mid semester break		
7	Fuzzy logic	
8	Bayesian networks	
9	Supervised machine learning	
10	Unsupervised machine learning	
11	Recommender systems	Assignment 2 due May 18
12	Advanced topics	Assignment 3 due May 25

13	Revision	

Unit Resources

Prescribed text(s) and readings

Artificial Intelligence: A Modern Approach, Russell and Norvig, Prentice Hall.

All resources including publications related to the subject can be downloaded from the subject web site.

Recommended text(s) and readings

Korb and Nicholson: *Bayesian Artificial Intelligence*, Capman and Hall.

Required software and/or hardware

JADE Agent Toolkit

Java SDK and JRE

Weka Data Mining Toolkit

Equipment and consumables required or provided

Students are required to have access to the standard system configuration available in the computer labs, and regular Internet access.

Study resources

Study resources we will provide for your study are:

Lecture notes provided on MUSO and tutorial questions.

Library access

The Monash University Library site contains details about borrowing rights and catalogue searching. To learn more about the library and the various resources available, please go to http://www.lib.monash.edu.au.

The Educational Library and Media Resources (LMR) is also a very resourceful place to visit at http://www.education.monash.edu.au/library/

Monash University Studies Online (MUSO)

All unit and lecture materials are available through MUSO (Monash University Studies Online). Blackboard is the primary application used to deliver your unit resources. Some units will be piloted in Moodle. If your unit is piloted in Moodle, you will see a link from your Blackboard unit to Moodle (http://moodle.monash.edu.au) and can bookmark this link to access directly. In Moodle, from the Faculty of Information Technology category, click on the link for your unit.

You can access MUSO and Blackboard via the portal: http://my.monash.edu.au

Click on the Study and enrolment tab, then Blackboard under the MUSO learning systems.

In order for your Blackboard unit(s) to function correctly, your computer needs to be correctly configured.

For example:

- Blackboard supported browser
- Supported Java runtime environment

For more information, please visit: http://www.monash.edu.au/muso/support/students/downloadables-student.html

You can contact the MUSO Support by phone : (+61 3) 9903 1268

For further contact information including operational hours, please visit:
http://www.monash.edu.au/muso/support/students/contact.html

Further information can be obtained from the MUSO support site:
http://www.monash.edu.au/muso/support/index.html

Assessment

Unit assessment policy

To pass this unit, a student must obtain :

- 40% or more in the unit's examination and
- 40% or more in the unit's 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 assessment then a mark of no greater than 44-N will be recorded for the unit.

Obtain an overall mark of 50 or more.

Assignment tasks

- ### Assignment Task

  Title : Problem solving, knowledge representation and planning

  Description :

  Problem Solving Exercise on knowledge representation and planning
  Weighting : 15%

  Criteria for assessment :

  Available at the Unit Homepage
  Due date : Available on Unit Homepage

- **Assignment Task**

  Title : Bayesian networks and machine learning

  Description :

  Problem Solving Exercise on Bayesian Networks and Machine Learning
  Weighting : 10%

  Criteria for assessment :

  Due date : Available on Unit Homepage
- **Assignment Task**

  Title : Software Agents

  Description :

  Practical/Programming Assignment involving implementation of a simple agent system using JADE Agent Toolkit.
  Weighting : 25%

  Criteria for assessment :

  Available on Unit Homepage
  Due date : Available on Unit Homepage

Examinations

- **Examination 1**

  Weighting : 50%

  Length : 3 hours

  Type (open/closed book) : Closed book

Assignment submission

The writtetn assignments will be submitted by paper submission to the lecturer. Students should submit the assignments with the appropriate cover sheet correctly filled out and attached. Do not email submissions.

The practical assignment wil include an interview with your tutor.

Assignment coversheets

Students must include an assignment coversheet. Assignment coversheets can be found :

- via the "Student assignment coversheets" (http://infotech.monash.edu.au/resources/student/assignments/) page on the faculty website

University and Faculty policy on assessment

Due dates and extensions

The due dates for the submission of assignments are given in the previous section. Please make every effort to submit work by the due dates. It is your responsibility to structure your study program around assignment deadlines, family, work and other commitments. Factors such as normal work pressures, vacations, etc. are seldom regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Students may apply for an extension on an assignment if they have an illness or accident. Applications must be accompanied by suitable certification (medical or police).

Late assignment

Assignments received after the due date will be subject to a penalty of 10% deduction in marks per day. Assignments received later than one week after the due date will not normally be accepted.

Return dates

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

Assessment for the unit as a whole is in accordance with the provisions of the Monash University Education Policy at http://www.policy.monash.edu/policy-bank/academic/education/assessment/

We will aim to have assignment results made available to you within two weeks after assignment receipt.

Plagiarism, cheating and collusion

Plagiarism and cheating are regarded as very serious offences. In cases where cheating has been confirmed, students have been severely penalised, from losing all marks for an assignment, to facing disciplinary action at the Faculty level. While we would wish that all our students adhere to sound ethical conduct and honesty, I will ask you to acquaint yourself with Student Rights and Responsibilities (http://www.infotech.monash.edu.au/about/committees-groups/facboard/policies/studrights.html) and the Faculty regulations that apply to students detected cheating as these will be applied in all detected cases.

In this University, cheating means seeking to obtain an unfair advantage in any examination or any other written or practical work to be submitted or completed by a student for assessment. It includes the use, or attempted use, of any means to gain an unfair advantage for any assessable work in the unit, where the means is contrary to the instructions for such work.

When you submit an individual assessment item, such as a program, a report, an essay, assignment or other piece of work, under your name you are understood to be stating that this is your own work. If a submission is identical with, or similar to, someone else's work, an assumption of cheating may arise. If you are planning on working with another student, it is acceptable to undertake research together, and discuss problems, but it is not acceptable to jointly develop or share solutions unless this is specified by your lecturer.

Intentionally providing students with your solutions to assignments is classified as "assisting to cheat" and students who do this may be subject to disciplinary action. You should take reasonable care that your solution is not accidentally or deliberately obtained by other students. For example, do not leave copies of your work in progress on the hard drives of shared computers, and do not show your work to other students. If you believe this may have

happened, please be sure to contact your lecturer as soon as possible.

Cheating also includes taking into an examination any material contrary to the regulations, including any bilingual dictionary, whether or not with the intention of using it to obtain an advantage.

Plagiarism involves the false representation of another person's ideas, or findings, as your own by either copying material or paraphrasing without citing sources. It is both professional and ethical to reference clearly the ideas and information that you have used from another writer. If the source is not identified, then you have plagiarised work of the other author. Plagiarism is a form of dishonesty that is insulting to the reader and grossly unfair to your student colleagues.

Register of counselling about plagiarism

The university requires faculties to keep a simple and confidential register to record counselling to students about plagiarism (e.g. warnings). The register is accessible to Associate Deans Teaching (or nominees) and, where requested, students concerned have access to their own details in the register. The register is to serve as a record of counselling about the nature of plagiarism, not as a record of allegations; and no provision of appeals in relation to the register is necessary or applicable.

Non-discriminatory language

The Faculty of Information Technology is committed to the use of non-discriminatory language in all forms of communication. Discriminatory language is that which refers in abusive terms to gender, race, age, sexual orientation, citizenship or nationality, ethnic or language background, physical or mental ability, or political or religious views, or which stereotypes groups in an adverse manner. This is not meant to preclude or inhibit legitimate academic debate on any issue; however, the language used in such debate should be non-discriminatory and sensitive to these matters. It is important to avoid the use of discriminatory language in your communications and written work. The most common form of discriminatory language in academic work tends to be in the area of gender inclusiveness. You are, therefore, requested to check for this and to ensure your work and communications are non-discriminatory in all respects.

Students with disabilities

Students with disabilities that may disadvantage them in assessment should seek advice from one of the following before completing assessment tasks and examinations:

- Faculty of Information Technology Student Service staff, and / or
- your Unit Coordinator, or
- Disabilities Liaison Unit

Deferred assessment and special consideration

Deferred assessment (not to be confused with an extension for submission of an assignment) may be granted in cases of extenuating personal circumstances such as serious personal illness or bereavement. Information and forms for Special Consideration and deferred assessment applications are available at http://www.monash.edu.au/exams/special-consideration.html. Contact the Faculty's Student Services staff at your campus for further information and advice.