FIT5047 Intelligent systems - Semester 1, 2011

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.

Mode of Delivery

Caulfield (Day)

Contact Hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload

For on campus students, workload commitments per week are:

- two-hour lecture
- two-hour lab/tutorial (requiring advance preparation)
- a minimum of 8 hours of personal study

Students are expected to work 12 hours per week.

Unit Relationships

Prohibitions

CSE5610

Chief Examiner

Kevin Korb

Campus Lecturer

Caulfield

Kevin Korb

Contact hours: 2-3 pm Thursdays - email for appointments at other times
Learning Objectives

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

- the applications of intelligent software systems;
- the principles and theoretical underpinning of intelligent software systems;
- models and approaches to building intelligent software systems;
- different software toolkits and development environments;
- current research trends in the field.

Developed attitudes that enable them to:

- foster critical and independent analysis of how intelligent techniques can be used to enhance software applications and the development of smart environments.

Developed the skills to:

- design and develop of intelligent applications;
- select and apply appropriate tools for a particular application.

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): 70%; In-semester assessment: 30%

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Value</th>
<th>Due Date</th>
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</thead>
<tbody>
<tr>
<td>Assignment 1 - Knowledge Representation and Planning</td>
<td>10%</td>
<td>25 March 2011</td>
</tr>
<tr>
<td>Assignment 2 - Bayesian Networks and Soft Computing</td>
<td>10%</td>
<td>21 April 2011</td>
</tr>
<tr>
<td>Assignment 3 - Machine Learning</td>
<td>10%</td>
<td>27 May 2011</td>
</tr>
<tr>
<td>Examination 1</td>
<td>70%</td>
<td>To be advised</td>
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</table>
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 with 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.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

Netica (free)

Weka Data Mining Toolkit (free)

Web access

Unit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date*</th>
<th>Activities</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>0</td>
<td>21/02/11</td>
<td></td>
<td>No formal assessment or activities are undertaken in week 0</td>
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<tr>
<td>Date</td>
<td>Topic</td>
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<tr>
<td>28/02/11</td>
<td>Introduction</td>
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<tr>
<td>07/03/11</td>
<td>Problem solving as search</td>
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<tr>
<td>14/03/11</td>
<td>Knowledge representation</td>
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<tr>
<td>21/03/11</td>
<td>Planning</td>
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<tr>
<td>28/03/11</td>
<td>Natural language processing</td>
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<tr>
<td>04/04/11</td>
<td>Soft computing</td>
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<tr>
<td>11/04/11</td>
<td>Bayesian networks</td>
<td></td>
<td></td>
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<tr>
<td>18/04/11</td>
<td>Intelligent decision support</td>
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<tr>
<td>02/05/11</td>
<td>Supervised machine learning</td>
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<tr>
<td>09/05/11</td>
<td>Unsupervised machine learning</td>
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<tr>
<td>16/05/11</td>
<td>Recommender systems</td>
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<tr>
<td>23/05/11</td>
<td>Artificial Life</td>
<td></td>
<td></td>
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<tr>
<td>30/05/11</td>
<td>SWOT VAC</td>
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Mid semester break

<table>
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<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>02/05/11</td>
<td>Supervised machine learning</td>
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<tr>
<td>09/05/11</td>
<td>Unsupervised machine learning</td>
</tr>
<tr>
<td>16/05/11</td>
<td>Recommender systems</td>
</tr>
<tr>
<td>23/05/11</td>
<td>Artificial Life</td>
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<tr>
<td>30/05/11</td>
<td>SWOT VAC</td>
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</tbody>
</table>

*Please note that these dates may only apply to Australian campuses of Monash University. Off-shore students need to check the dates with their unit leader.

**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 - Knowledge Representation and Planning
  
  **Description:**
  A problem solving exercise on knowledge representation and planning.
  
  **Weighting:**
  10%
Criteria for assessment:
Will be available on Moodle.

Due date:
25 March 2011

**Assessment task 2**

Title:
Assignment 2 - Bayesian Networks and Soft Computing

Description:
A problem solving exercise on Bayesian networks and soft computing.

Weighting:
10%

Criteria for assessment:
Will be available on Moodle.

Due date:
21 April 2011

**Assessment task 3**

Title:
Assignment 3 - Machine Learning

Description:
A problem solving exercise on machine learning.

Weighting:
10%

Criteria for assessment:
Will be available on Moodle.

Due date:
27 May 2011

**Examinations**

**Examination 1**

Weighting:
70%

Length:
3 hours

Type (open/closed book):
Closed book

Electronic devices allowed in the exam:
None

**Assignment submission**

Assignment coversheets are available via "Student Forms" on the Faculty website: http://www.infotech.monash.edu.au/resources/student/forms/

You MUST submit a completed coversheet with all assignments, ensuring that the plagiarism declaration section is signed.
Extensions and penalties

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


Returning assignments

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

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)
- Special Consideration (http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.html)
- 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

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
Reading List

Prescribed text:


Recommended texts: