FIT5047 Intelligent systems - Semester 2, 2015

This unit introduces the main problems and approaches to designing intelligent software systems including automated search methods, knowledge representation and reasoning, planning, reasoning under uncertainty, machine learning paradigms, and evolutionary algorithms.

Mode of Delivery

Caulfield (Evening)

Workload Requirements

Minimum total expected workload equals 12 hours per week comprising:

(a.) Contact hours for on-campus students:

- Two hours of lectures
- One 2-hour laboratory

(b.) Additional requirements (all students):

- A minimum of 8 hours independent study per week for completing lab and project work, private study and revision.

See also Unit timetable information

Unit Relationships

Prohibitions

CSE5610

Prerequisites

FIT9131 or FIT5131 or FIT9017 or equivalent
Fundamental math with introductory knowledge of probability

Chief Examiner

Professor Ingrid Zukerman

Campus Lecturer

Caulfield

David Dowe
Consultation hours: To Be Announced
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 the Student Evaluation of Teaching and Units (SETU) survey. 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, see:

www.monash.edu.au/about/monash-directions/ and on student evaluations, see:
www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html

Previous Student Evaluations of this Unit

Assessment weighting has been changed due to students' feedback.

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

Learning Outcomes

At the completion of this unit students should be able to:

1. explain the theoretical foundations of Artificial Intelligence (AI) - such as the Turing test, Rational Agency and the Frame Problem - that underpin the application to information technology and society;
2. critically explain, evaluate and apply appropriate AI theories, models and/or techniques in practice - including logical inference, heuristic search, genetic algorithms, supervised and unsupervised machine learning and Bayesian inference;
3. utilise appropriate software tools to develop AI models or software;
4. utilise and explain evaluation criteria to measure the correctness and/or suitability of models.
# Unit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Activities</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>No formal assessment or activities are undertaken in week 0</td>
</tr>
<tr>
<td>1</td>
<td>Introduction to Artificial Intelligence</td>
<td>Assessment task 3: Tutorial Work is assessed each week during and after each tutorial session</td>
</tr>
<tr>
<td>2</td>
<td>Problem Solving</td>
<td></td>
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<tr>
<td>3</td>
<td>Knowledge Representation (Logic)</td>
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<tr>
<td>4</td>
<td>Planning</td>
<td></td>
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<tr>
<td>5</td>
<td>Soft Computing &amp; Probability</td>
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<tr>
<td>6</td>
<td>Stochastic Search &amp; Evolutionary Algorithms</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bayesian Networks</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Intelligent Decision Support</td>
<td>Assignment 1: Assignment 1 - Problem Solving, Knowledge Representation and Bayesian Networks due</td>
</tr>
<tr>
<td>9</td>
<td>Supervised Machine Learning</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Unsupervised Machine Learning</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Stochastic Problem Solving</td>
<td>Assignment 2: Machine Learning due</td>
</tr>
<tr>
<td>12</td>
<td>Agent-Based Modelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SWOT VAC</td>
<td>No formal assessment is undertaken in SWOT VAC</td>
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</table>

*Unit Schedule details will be maintained and communicated to you via your learning system.

## Teaching Approach

### Lecture and tutorials or problem classes

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

## Assessment Summary

Examination (3 hours): 70%; In-semester assessment: 30%

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Value</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1 - Problem Solving, Knowledge Representation and Bayesian Networks</td>
<td>10%</td>
<td>Week 8</td>
</tr>
<tr>
<td>Assignment 2 - Machine Learning</td>
<td>10%</td>
<td>Week 11</td>
</tr>
<tr>
<td>Assessment Task 3: Tutorial Participation</td>
<td>10%</td>
<td>After each</td>
</tr>
</tbody>
</table>

4
<table>
<thead>
<tr>
<th>Unit Schedule</th>
<th>tutorial session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination 1</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>To be advised</td>
</tr>
</tbody>
</table>
Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles

Academic Integrity - Please see resources and tutorials at
http://www.monash.edu/library/skills/resources/tutorials/academic-integrity/

Assessment Tasks

Participation

• Assessment task 1

  Title: Assignment 1 - Problem Solving, Knowledge Representation and Bayesian Networks
  Description: Learning Outcomes: 2, 3, 4. Exercises involving problem solving (and knowledge representation) and Bayesian networks.
  Weighting: 10%
  Criteria for assessment: Correctness and completeness of submitted answers to problems and/or Bayesian networks.
  Due date: Week 8

• Assessment task 2

  Title: Assignment 2 - Machine Learning
  Description: Learning Outcomes: 2, 3, 4. Problem solving in machine learning
  Weighting: 10%
  Criteria for assessment: Correctness and completeness of answers to machine learning problems.
  Due date: Week 11

• Assessment task 3

  Title: Assessment Task 3: Tutorial Participation
  Description: Learning Outcomes: 1, 2, 3. Tutorial exercises and participation will be assessed.
  Weighting: 10%
  Criteria for assessment:
Assessment Requirements

The criteria used to assess are:

Degree of correctness and level of understanding of the underlying modelling techniques and any other relevant material.
Degree of completeness of your answers to tutorial questions and any other relevant material.

**Due date:**
After each tutorial session

Examinations

- **Examination 1**
  
  **Weighting:**
  70%
  
  **Length:**
  3 hours
  
  **Type (open/closed book):**
  Closed book

  **Electronic devices allowed in the exam:**
  Regular Calculator

Learning resources

Reading list


Monash Library Unit Reading List (if applicable to the unit)
http://readinglists.lib.monash.edu/index.html

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
- Other: Solutions to tutorials and labs

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.monash.edu.au/exams/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.

Resubmission of assignments

No resubmissions.

Referencing requirements

See Library Guides for Citing and Referencing at http://guides.lib.monash.edu/content.php?pid=88267&sid=656564

Assignment submission

It is a University requirement (http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-managing-plagiarism-collusion-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 electronic submission). Please note that it is your responsibility to retain copies of your assessments.

Online submission

If Electronic Submission has been approved for your unit, please submit your work via the learning system for this unit, which you can access via links in the my.monash portal.

Required Resources

Please check with your lecturer before purchasing any Required Resources. Limited copies of prescribed texts are available for you to borrow in the library, and prescribed software is available in student labs.

Netica (free)

Netlogo (free)

Weka Data Mining Toolkit (free)

Web access

Prescribed text(s)

Limited copies of prescribed texts are available for you to borrow in the library.

Recommended text(s)


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: www.policy.monash.edu.au/policy-bank/academic/education/index.html

Faculty resources and policies
Important student resources including Faculty policies are located at http://intranet.monash.edu.au/infotech/resources/students/

Graduate Attributes Policy
http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.html

Student Charter

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 http://www.monash.edu.au/students. For Malaysia see http://www.monash.edu.my/Student-services, and for South Africa see http://www.monash.ac.za/current/.

Monash University Library
The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research. Go to www.lib.monash.edu.au or the library tab in my.monash portal for more information. At Malaysia, visit the Library and Learning Commons at http://www.lib.monash.edu.my/. At South Africa visit http://www.lib.monash.ac.za/.

Disability Liaison Unit
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://www.monash.edu/equity-diversity/disability/index.html
- Telephone: 03 9905 5704 to book an appointment with a DLO; or contact the Student Advisor, Student Community Services at 03 55146018 at Malaysia
- Email: dlu@monash.edu
- Drop In: Equity and Diversity Centre, Level 1, Building 55, Clayton Campus, or Student Community Services Department, Level 2, Building 2, Monash University, Malaysia Campus