CS255-15 Artificial Intelligence

26/27

Department
Computer Science
Level
Undergraduate Level 2
Module leader
James Archbold
Credit value
15
Module duration
10 weeks
Assessment
Multiple
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This module will introduce the foundational concepts in artificial intelligence. This module is only available to students in the second year of their degree and is not available as an unusual option or to students in other years of study.

Module aims

This module will introduce the foundational concepts in artificial intelligence. Specifically, it will provide a broad coverage of rational agency, search techniques, knowledge representation and planning, constraint satisfaction problem solving, supervised and unsupervised machine learning, reinforcement learning, and Bayesian approaches to artificial intelligence.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

1. Introduction
2. Rational Agents
3. Uninformed and Heuristic Search

4. Constraint Satisfaction Problems and Local Search
5. Adversarial Search
6. Knowledge Representation and Planning
7. Supervised Machine Learning
8. Bayesian AI
9. Unsupervised Machine Learning
10. Reinforcement Learning

Learning outcomes

By the end of the module, students should be able to:

- Develop an appreciation of AI through the concept of rational agency
- Understand various methods for search (uninformed, heuristic and adversarial) and constraint satisfaction problems
- Understand a variety of methods for knowledge representation along with basic reasoning and planning approaches
- Develop an appreciation of machine learning, including supervised and unsupervised methods
- Understand various methods for representing and reasoning under uncertainty

Indicative reading list

Reading lists can be found in Talis

Specific reading list for the module

Subject specific skills

- Develop an appreciation of AI through the concept of rational agency
- Understand various methods for search (uninformed, heuristic and adversarial) and constraint satisfaction problems
- Understand a variety of methods for knowledge representation along with basic reasoning and planning approaches
- Develop an appreciation of machine learning, including supervised and unsupervised methods
- Understand various methods for representing and reasoning under uncertainty.

Transferable skills

Problem solving
Critical thinking

Study

Study time

Type	Required
Lectures	29 sessions of 1 hour (19%)
Seminars	6 sessions of 1 hour (4%)
Private study	115 hours (77%)
Total	150 hours

Private study description

Required reading (as identified in lectures)
Background reading
Exercises
Revision

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group B

	Weighting	Study time	Eligible for self-certification
Centrally-timetabled examination (On-campus) CS255 exam	100%		No

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- Students may use a calculator
- Answerbook Gold (24 page)

Assessment group R3

	Weighting	Study time	Eligible for self-certification
In-person Examination - Resit	100%		No

	Weighting	Study time	Eligible for self-certification
CS255 resit exam			

- Students may use a calculator
- Answerbook Gold (24 page)

Feedback on assessment

End of year results

Past exam papers for CS255

Availability

Courses

This module is Optional for:

- Year 2 of UCSA-I1N1 Undergraduate Computer Science with Business Studies
- Year 2 of UCSA-G406 Undergraduate Computer Systems Engineering
- Year 2 of UCSA-G408 Undergraduate Computer Systems Engineering
- Year 2 of USTA-G305 Undergraduate Data Science (MSci) (with Intercalated Year)

This module is Option list A for:

- Year 2 of UCSA-G500 Undergraduate Computer Science
- UCSA-G503 Undergraduate Computer Science MEng
  - Year 2 of G500 Computer Science
  - Year 2 of G503 Computer Science MEng
- Year 2 of USTA-G302 Undergraduate Data Science

This module is Option list B for:

- Year 2 of UCSA-G4G1 Undergraduate Discrete Mathematics
- UCSA-G4G3 Undergraduate Discrete Mathematics
  - Year 2 of G4G1 Discrete Mathematics
  - Year 2 of G4G3 Discrete Mathematics