

# CS255-15 Artificial Intelligence

**24/25**

**Department**

Computer Science

**Level**

Undergraduate Level 2

**Module leader**

Nathan Griffiths

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

Multiple

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

This module will introduce the foundational concepts in artificial intelligence and knowledge-based systems.

This module is only available to students in the second year of their degree and is not available as an unusual option to students in other years of study.

### Module aims

This module will introduce the foundational concepts in artificial intelligence and knowledge-based systems. Specifically, it will provide a broad coverage of search, planning, adversarial search (games), constraint satisfaction problem solving, reinforcement learning, rational and logical agency, knowledge representation techniques, 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. Agent Architectures and Hierarchical Control

4. Uninformed Search
5. Informed Search
6. Constraint Satisfaction Problems
7. Local Search
8. Adversarial Search
9. Planning
10. Knowledge Representation
11. Bayesian AI
12. Reinforcement Learning
13. Deliberative and Reactive Architectures
14. Agent Cooperation

## **Learning outcomes**

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

- - Develop an appreciation for Knowledge Based Systems, Intelligent Agents and their architectures
- - Understand a wide variety of knowledge representation and artificial intelligence approaches to planning
- - Understand various methods for search (uninformed and informed), planning and reinforcement learning
- - Understand various methods for representing and reasoning under uncertainty.

## **Indicative reading list**

Please see Talis Aspire link for most up to date list.

[View reading list on Talis Aspire](#)

## **Subject specific skills**

develop an appreciation for Knowledge Based Systems, Intelligent Agents and their architectures, understand a wide variety of knowledge representation and artificial intelligence approaches to planning, understand various methods for search (uninformed and informed), planning and reinforcement learning, and understand various methods for representing and reasoning under uncertainty.

## **Transferable skills**

Programming  
Communication skills (written)  
Problem solving  
Critical thinking

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## Study

### Study time

Type	Required
Lectures	30 sessions of 1 hour (20%)
Seminars	7 sessions of 1 hour (5%)
Private study	113 hours (75%)
Total	150 hours

### Private study description

Required reading (as identified in lectures)  
Background reading  
Exercise sheets  
Revision  
Coursework

## Costs

No further costs have been identified for this module.

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## Assessment

You do not need to pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

### Assessment group D4

	Weighting	Study time
Coursework	20%	
In-person Examination CS255 exam	80%	

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- Answerbook Pink (12 page)
- Students may use a calculator

### Assessment group R1

**Weighting****Study time**

In-person Examination - Resit  
CS255 resit exam

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100%

- Answerbook Pink (12 page)
- Students may use a calculator

**Feedback on assessment**

Mark and written feedback returned via Tabula.

[Past exam papers for CS255](#)

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**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:

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

This module is Option list B for:

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