CS2D3-15 Artificial Intelligence

21/22

Department
>Computer Science

Level
>Undergraduate Level 2

Module leader
>Adam Chester

Credit value
>15

Module duration
>5 weeks

Assessment
>60% coursework, 40% exam

Study location
>University of Warwick main campus, Coventry

Description

Introductory description

This module will teach students about the foundational concepts of artificial intelligence and knowledge-based systems. They will develop an understanding of both knowledge-based systems, intelligent agents, and their architectures, and a variety of knowledge representation and artificial intelligence approaches including search, planning, reinforcement learning, and Bayesian reasoning, which they will then go on to apply. Additionally, they will gain an initial overview of artificial intelligence, providing them with a basic, practical introduction to significant algorithms, as well as a foundation for topics in machine learning.

Module aims

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

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.

This module will allow students to:

- demonstrate an appreciation for knowledge-based systems, intelligent agents, and their architectures
- understand and apply a variety of uninformed and informed search algorithms
- understand and apply algorithms for reinforcement learning
- demonstrate knowledge of artificial intelligence approaches to planning
- understand and apply various methods for representing knowledge and performing inference
- understand and apply various methods for representing and reasoning under uncertainty

Learning outcomes

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

- Understand and explain the central concepts of artificial intelligence.
- Understand and explain the capabilities of artificial intelligence with reference to a range of specific application areas.
- Understand and apply standard artificial intelligence techniques.
- Apply artificial intelligence techniques to problem solving.
- Understand and explain the limitations of and current directions in artificial intelligence.

Indicative reading list

Poole, DL, and Mackworth, AK "Artificial Intelligence: Foundations of Computational Agents (2/e)", Cambridge (2017)
Russell, S., and Norvig, P., "Artifical Intelligence: A Modern Approach (3/e)", Prentice-Hall (2010)
Brachman, R., and Levesque, H., "Knowledge Representation and Reasoning", Morgan Kaufmann (2004)
Korb, K., and Nicholson, A., "Bayesian Artificial Intelligence", Chapman and Hall (2004)

Subject specific skills

- Identify organisational information requirements and model data solutions using conceptual data modelling techniques
- Use a range of analytical techniques such as data mining, time series forecasting and modelling techniques to identify and predict trends and patterns in data
- Report on conclusions gained from analysing data using a range of statistical software tools
- Summarise and present results to a range of stakeholders making recommendations

Transferable skills

- Have demonstrated that they have mastered basic business disciplines, ethics and courtesies, demonstrating timeliness and focus when faced with distractions and the ability to complete tasks to a deadline with high quality.
- Flexible attitude
- Ability to perform under pressure
- A thorough approach to work

Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Seminars	19 sessions of 30 minutes (6%)
Tutorials	14 sessions of 1 hour (9%)
Practical classes	8 sessions of 1 hour (5%)
Work-based learning	30 sessions of 1 hour (20%)
Other activity	68 hours 30 minutes (45%)
Total	150 hours

Private study description

No private study requirements defined for this module.

Other activity description

Self study

Costs

No further costs have been identified for this module.

Assessment

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

Assessment group D1

	Weighting	Study time	Eligible for self-certification
Work-based individual coursework assignment	50%		No
End of block teaching coursework	10%		Yes (extension)
Artificial Intelligence examination	40%		No

Feedback on assessment

Written and verbal

Availability

There is currently no information about the courses for which this module is core or optional.