CS404-15 Agent Based Systems

23/24

Department
Computer Science
Level
Undergraduate Level 4
Module leader
Markus Brill
Credit value
15
Module duration
10 weeks
Assessment
Multiple
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Agent-based systems offer a new paradigm for computer science, based around a strong theoretical foundation and with a large number of practical deployed applications.

Module web page

Module aims

This module will provide a context for agent-based systems in terms of the recent and developing computing landscape of distributed information and processing resources, and will describe fundamental techniques and systems, illustrating them with real-world applications.

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.

Overview: definitions of agents, distributed AI and agents, intelligent agents, multi-agent systems, cooperation, agent application areas.

Logic-based agents: actions, goals and strategies.

Decision-making agents: expected utility and decisions.

Game-theoretic agents: equilibria and rationality.

Learning-agents: Markov Decision Processes, policy approximation and opponent modelling.

Social-agents: Cooperative decision-making, matching and networks.

Learning outcomes

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

- Students will learn the basic methodologies for the design and the analysis of multi-agent systems, in competitive and cooperative interaction, both from the theoretical and the practical point of view.

Indicative reading list

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

View reading list on Talis Aspire

Subject specific skills

Logical reasoning;
Problem Solving;

Transferable skills

Problem Solving;
Logical reasoning;
Self-directed learning.

Study

Study time

Type	Required
Lectures	30 sessions of 1 hour (20%)
Seminars	10 sessions of 1 hour (7%)
Private study	110 hours (73%)
Total	150 hours

Private study description

Inclusive of private study, coursework, background reading and revision.

Costs

No further costs have been identified for this module.

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 D2

	Weighting	Study time
Programming and report	25%	
Programming and report. Approximately 30 pages.		
In-person Examination	75%	
CS404 examination		

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

Assessment group R3

	Weighting	Study time
On-campus Examination - Resit	100%	
CS404 resit paper		

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

Feedback on assessment

Written feedback with mark breakdown for programming assignment and report.

Past exam papers for CS404

Availability

Pre-requisites

Knowledge of Python programming.

Courses

This module is Optional for:

- Year 5 of UCSA-G504 MEng Computer Science (with intercalated year)
- Year 1 of TCSA-G5PB Postgraduate Taught Data Analytics (CUSP)
- UCSA-G503 Undergraduate Computer Science MEng
    - Year 4 of G503 Computer Science MEng
    - Year 4 of G503 Computer Science MEng
- Year 4 of USTA-G1G3 Undergraduate Mathematics and Statistics (BSc MMathStat)
- Year 5 of USTA-G1G4 Undergraduate Mathematics and Statistics (BSc MMathStat) (with Intercalated Year)

This module is Option list A for:

- Year 5 of UCSA-G504 MEng Computer Science (with intercalated year)
- UCSA-G503 Undergraduate Computer Science MEng
    - Year 4 of G503 Computer Science MEng
    - Year 4 of G503 Computer Science MEng
- Year 4 of USTA-G304 Undergraduate Data Science (MSci)
- Year 4 of UCSA-G4G3 Undergraduate Discrete Mathematics
- Year 5 of UCSA-G4G4 Undergraduate Discrete Mathematics (with Intercalated Year)

This module is Option list B for:

- Year 4 of UCSA-G408 Undergraduate Computer Systems Engineering
- Year 5 of UCSA-G409 Undergraduate Computer Systems Engineering (with Intercalated Year)