F29AI Artificial Intelligence and Intelligent Agents

COURSE DETAILS
Course Code: F29AI
Full Course Title: Artificial Intelligence and Intelligent Agents
SCQF Level: 9
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: Yes
Postgraduate Taught: Yes
Postgraduate Research: No

Additional Information:

COURSE AIMS
To introduce the fundamental concepts and techniques of AI, including planning, search and knowledge representation

- To introduce the scope, subfields and applications of AI, topics to be taken from a list including natural language processing, expert systems, robots and autonomous agents, machine learning and neural networks, and vision.
- To develop skills in AI programming in an appropriate language

LEARNING OUTCOMES – SUBJECT MASTERY

- Critical understanding of traditional AI problem solving and knowledge representation methods
- Use of knowledge representation techniques (such as predicate logic and frames).
- Critical understanding of different systematic and heuristic search techniques
- Practice in expressing problems in terms of state-space search
- Broad knowledge and understanding of the subfields and applications of AI, such as computer vision, machine learning and expert systems.
- Detailed knowledge of one subfield of AI (e.g. natural language processing, planning) and ability to apply its formalisms and representations to small problems
- Detailed understanding of different approaches to autonomous agent and robot architectures, and the ability to critically evaluate their advantages and disadvantages in different contexts.
- Practice in the implementation of simple AI systems using a suitable language

LEARNING OUTCOMES – PERSONAL ABILITIES

- Identification, representation and solution of problems
- Research skills and report writing
- Practice in the use of ICT, numeracy and presentation skills

SYLLABUS

- Search algorithms (depth first search, breadth first search, uniform cost search, A* search)
- Constraint satisfaction problems;
- Games (min-max, alpha-beta pruning);
F29AI Artificial Intelligence and Intelligent Agents

- logic, resolution, introductory logic programming
- knowledge representation – logic, rules, frames
- goal and data-driven reasoning
- practical rule-based programming
- Overview of main fields of AI (Vision, Learning, Knowledge Engineering)
- In depth view of one field of AI (e.g. Planning, Natural language)
- Autonomous agents
- Applications of AI
- AI programming

NOTE: Elementary knowledge of logic at the level of undergraduate Computer Science. Knowledge of high-level programming language concepts.

COURSE RELATIONSHIPS
N/A

LOCATION AND ASSESSMENT METHODS

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