2024 / 25

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South East Technological University

Module Descriptor

Artificial Intelligence (Computing and Mathematics)

Artificial Intelligence (A14322)

Short Title: Artificial Intelligence
Department: Computing and Mathematics
Credits: 5 **Level:** Advanced

Description of Module / Aims

The purpose of this module is to introduce the student to the fundamental concepts of Artificial Intelligence. The student will be introduced to symbolic A.I., knowledge representation, search techniques and an A.I. programming paradigm.

Programmes

		stage/semester/status
COMP-0215	BSc (Hons) in Applied Computing (International) (WD_KACCM_BI)	4 / 8 / E
COMP-0215	BSc (Hons) in Applied Computing (WD_KACCM_B)	4 / 8 / E
COMP-0215	BSc (Hons) in Applied Computing (WD_KCOMP_B)	4 / 8 / E
COMP-0215	BSc (Hons) in Computer Forensics and Security (WD_KCOFO_B)	4 / 8 / E
COMP-0215	BSc (Hons) in Computer Science (WD_KCMSC_B)	4 / 8 / E
COMP-0215	BSc (Hons) in Software Systems Development (WD_KDEVP_B)	4 / 8 / E

Indicative Content

- History of A.I: Introduction to problem characteristics; Historical and contemporary applications
- Knowledge representation techniques: Trees; Productions; Frames; Semantic networks; Predicate calculus and theorem proving
- Search: Un-informed; Bi-directional; Heuristic; Constraint based; Application domains
- A.I. architectures: Planning and case based reasoning; Production systems; Rule based systems; Agent, reactive and blackboard systems; Non-monotonic systems; Neural networks; Natural language systems
- Practical Programme: The student will exposed to A.I. problems in practical sessions using an A.I language such as Prolog

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Appraise various knowledge representation techniques.
2. infer using the rules of logic as applied in predicate calculus.
3. Appraise different heuristic search techniques and their applications.
4. Construct programs in an Artificial Intelligence based language.

Learning and Teaching Methods

- This module will be presented by a combination of lectures and computer-based practical.
- The lectures will be used to introduce new topics and their related concepts.
- The practical element is intended to provide the student with the necessary skills to represent and solve A.I. problems using a suitable programming language.
- Student will be expected to read ahead on lecture content.
- Student will be expected to complement lecture content with self-learning.
- Student will be expected to develop skills to solve problems using A.I. language in practicals.

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	24	
Practical	24	
Independent Learning	87	

Assessment Methods

	Weighting	Outcomes Assessed
Final Written Examination	100%	1,2,3,4

Assessment Criteria

<40%: Unable to explain the principles of AI techniques for solving simple problems.

40%–49%: Able to explain the principles of AI techniques for solving simple problems.

50%–59%: Able to explain and apply AI techniques for solving problems.

60%–69%: Able to explain, choose and apply AI techniques for solving complex problems.

70%–100%: Able to critically choose, adapt and apply complex AI techniques for solving complex problems.

Supplementary Material(s)

- Luger, G. *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*. 6th ed. Harlow: Addison Wesley, 2008.
- Negnevitsky, M. *Artificial Intelligence: A Guide to Intelligent Systems*. 3rd ed. Harlow: Addison Wesley, 2011.
- Russell, S. and P. Norvig. *Artificial Intelligence: A Modern Approach*. 3rd ed. NJ: Prentice Hall, 2009.

Requested Resources

- Room Type: Computer Lab