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MODULE DESCRIPTOR

Module Title

Advanced Artificial Intelligence

Reference	CM4107	Version	1
Created	April 2017	SCQF Level	SCQF 10
Approved	August 2017	SCQF Points	15
Amended		ECTS Points	7.5

Aims of Module

To introduce students to the state-of-the-art Artificial Intelligence, including machine learning and neural networks. A particular focus will be late-breaking techniques in Deep Learning.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Explain and analyse techniques used for neural and deep learning.
- 2 Implement key algorithms, critically evaluate Artificial Intelligence solutions and appraise ethical issues.
- 3 Describe variety of methods and technologies developed for Artificial Intelligence that can be applied to real-world problems.
- 4 Apply the methods and techniques used in machine learning and logics.
- 5 Critically examine and evaluate relevant literature in artificial intelligence.

Indicative Module Content

Fundamentals of Natural and Artificial Logic; Reasoning and Inferring Searching and Planning; Computational Game Theory; Artificial Intelligence heuristics; Programming for Games; Probabilistic Bayesian Inference; Machine Learning Algorithms; Swarm Intelligence and Multi-Agent Systems; Neural and Bio-Inspired Intelligence; Problem Solving in Artificial Intelligence; Knowledge-based Artificial Intelligence; Real-World Applications of Artificial Intelligence; Deep Learning;

Module Delivery

Key concepts are introduced and illustrated through lectures and directed reading. The understanding of students is tested and further enhanced through interactive tutorials. In the laboratories, the student will progress through a sequence of exercises to develop sufficient knowledge and skills in Artificial Intelligence.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	33	N/A
Non-Contact Hours	117	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	100%	Outcomes Assessed:	1, 2, 3, 4, 5
Description:	Practical work worth 100%				

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The student must achieve a D in C1.

Module Grade	Minimum Requirements to achieve Module Grade:
A	The student must achieve an A in C1.
B	The student must achieve a B in C1.
C	The student must achieve a C in C1.
D	The student must achieve a D in C1.
E	The student must achieve an E in C1.
F	The student must achieve an F in C1.
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	Russell and Norvig. Artificial Intelligence: A Modern Approach.
2	Raschka. Python Machine Learning. Packt
3	N D LEWIS, 2016, Deep Learning Step by Step with Python
4	RASHID T, 2016, Make Your Own Neural Network, CreateSpace Publishing
5	BISHOP C, 2006 , Pattern Recognition and Machine Learning, Springer
6	KOWALSKI R, 2011, Computational Logic and Human Thinking, Cambridge University Press.
7	ERTEL W, 2011, Introduction to Artificial Intelligence, Springer