

## MODULE DESCRIPTOR

### Module Title

Machine Learning and Artificial Intelligence

Reference	CM3710	Version	2
Created	January 2023	SCQF Level	SCQF 9
Approved	May 2019	SCQF Points	30
Amended	June 2023	ECTS Points	15

### Aims of Module

To provide students with the ability to demonstrate the practical skills required for the development of intelligent systems, including the application of machine learning, in solving real-world problems.

### Learning Outcomes for Module

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

- 1 Demonstrate a critical understanding of the use of machine learning and artificial intelligence techniques in real-world applications.
- 2 Critically analyse the strengths and limitations of current machine learning and Artificial Intelligence techniques.
- 3 Compare and contrast the main techniques within machine learning and Artificial Intelligence.
- 4 Develop an intelligent system using suitable machine learning and/or Artificial Intelligence techniques to solve a given problem.

### Indicative Module Content

Artificial Intelligence - definition, concepts, and examples. Intelligent behaviour-Search, Case-based reasoning, Genetic Algorithms. Problem solving and intelligent search. Supervised and unsupervised machine learning including neural nets, support vector machines, decision trees, probabilistic learning, instance-based learners, metric learning and clustering algorithms. Convolutional Neural Networks and Deep Learning. Real-World Applications. Ethical AI.

### Module Delivery

The module is delivered in Blended Learning mode using structured online learning materials/activities and directed study, facilitated by regular online tutor support. Workplace Mentor support and work-based learning activities will allow students to contextualise this learning to their own workplace. Face-to-face engagement occurs through annual induction sessions, employer work-site visits, and modular on-campus workshops.

<b>Indicative Student Workload</b>	Full Time	Part Time
Contact Hours	30	N/A
Non-Contact Hours	30	N/A
Placement/Work-Based Learning Experience [Notional] Hours	240	N/A
TOTAL	300	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>	240	

## 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

Description: This coursework will consist of an AI/machine learning development exercise and analysis.

## MODULE PERFORMANCE DESCRIPTOR

### Explanatory Text

The calculation of the overall grade for this module is based on 100% weighting of C1. An overall minimum grade D is required to pass the module.

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

## Module Requirements

Prerequisites for Module None, in addition to course entry requirements.

Corequisites for module None.

Precluded Modules None.

## INDICATIVE BIBLIOGRAPHY

- 1 RUSSELL, S. and NORVIG, P. 2016. Artificial Intelligence: A Modern Approach. 3rd ed. Pearson.
- 2 LEWIS, N. D. 2016, Deep Learning Step by Step with Python. CreateSpace Independent Publishing Platform.
- 3 RASHID T, 2016. Make Your Own Neural Network. CreateSpace Publishing.
- 4 FINLAY, S., 2017. Artificial Intelligence and Machine Learning for Business: A No-Nonsense Guide to Data Driven Technologies. Realtivistic.
- 5 SIEGEL, E. 2016. Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die. John Wiley & Sons.