

## MODULE DESCRIPTOR

### Module Title

Machine Learning			
Reference	CMM548	Version	1
Created	October 2024	SCQF Level	SCQF 11
Approved	February 2025	SCQF Points	15
Amended		ECTS Points	7.5

### Aims of Module

This module aims to provide students with the necessary technical skills and underlying knowledge that enable them to apply and evaluate different data analytics and machine learning algorithms.

### Learning Outcomes for Module

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

- 1 Analyse complex datasets to identify patterns and insights that inform machine learning models.
- 2 Design machine learning algorithms to solve real-world problems.
- 3 Evaluate the performance of different machine learning models using appropriate metrics and techniques.
- 4 Create innovative solutions by applying machine learning techniques to new and emerging challenges.
- 5 Make informed judgements on the ethical implications and societal impacts of deploying machine learning systems.

### Indicative Module Content

Introduction to Machine Learning, Mathematical Foundations, Data Preprocessing and Exploration, Supervised Learning Algorithms, Unsupervised Learning Algorithms, Model Evaluation and Validation, Advanced Topics in Machine Learning, Ethics and Fairness in Machine Learning, Practical Applications and Case Studies.

### Module Delivery

Lectures are used to deliver the main principles and techniques. Practical sessions are used to acquire practical skills and reinforce knowledge from the lectures.

### Indicative Student Workload

	Full Time	Part Time
Contact Hours	30	30
Non-Contact Hours	120	120
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
<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: A coursework consisting of designing, implementing and testing a solution to a machine learning-based problem.

**MODULE PERFORMANCE DESCRIPTOR****Explanatory Text**

The calculation of the overall grade for this module is based on 100% weighing 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 needs to achieve an A in C1.
<b>B</b>	The student needs to achieve a B in C1.
<b>C</b>	The student needs to achieve a C in C1.
<b>D</b>	The student needs to achieve a D in C1.
<b>E</b>	The student needs to achieve an E in C1.
<b>F</b>	The student needs to 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.
Corequisites for module	None.
Precluded Modules	None.

**INDICATIVE BIBLIOGRAPHY**

- 1 Geron, A. (2019) Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems. 2nd edn. Sebastopol, CA: O'Reilly.
- 2 Jung, A. (2022) Machine learning: the basics. Singapore: Springer.