

## MODULE DESCRIPTOR

### Module Title

Computer Vision

Reference	CM4126	Version	3
Created	February 2025	SCQF Level	SCQF 10
Approved	June 2021	SCQF Points	15
Amended	February 2025	ECTS Points	7.5

### Aims of Module

This module aims to equip students with the skills to develop computational solutions for understanding the content of images and video in a way similar to human perception.

### Learning Outcomes for Module

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

- 1 Communicate a range of image processing and image manipulation techniques.
- 2 Critique a range of image features extraction and features representation methods.
- 3 Question different machine learning and deep learning methods for image classification and object detection and recognition tasks.
- 4 Develop an end-to-end intelligent computer vision solution by applying underlying concepts and theories of modern computer vision.

### Indicative Module Content

Image processing methods, core image processing tasks, modern computer vision methods, object detection, localisation and recognition, object tracking and motion estimation. Relevant tools and technologies such as Python, OpenCV, and Tensorflow will be used.

### 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	N/A
Non-Contact Hours	120	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
Description:	The practical assessment will be based on applying computer vision techniques to a case study from the public domain.				

**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**

- House, J. and Minichino, J. (2020) Learning OpenCV 4 Computer Vision with Python 3: Get to grips with tools, techniques, and algorithms for computer vision and machine learning, 3rd edn. Birmingham, UK: Packt Publishing.
- Kar, K. (2020) Mastering Computer Vision with TensorFlow 2.x: Build Advanced Computer Vision Applications Using Machine Learning and Deep Learning Techniques. Birmingham, UK: Packt Publishing.
- Geron, A. (2019) Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems. 3rd edn. Sebastopol, CA: O'Reilly Media.