

## MODULE DESCRIPTOR

### Module Title

Internet of Things

Reference	CM3142	Version	1
Created	November 2023	SCQF Level	SCQF 9
Approved	June 2018	SCQF Points	15
Amended	March 2021	ECTS Points	7.5

### Aims of Module

To enable students to design and implement simple, integrated systems, using low cost embedded hardware and software development tools that implement common interface standards, that can process data acquired from sensors, reacting to this data or transferring the data across the internet.

### Learning Outcomes for Module

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

- 1 Discuss the key concepts, protocols, and enabling technologies of the Internet of Things.
- 2 Defend the selection and use of technologies for inclusion in a simple IoT system.
- 3 Demonstrate the ability to create a simple Internet of Things application.
- 4 Assess typical legal, ethical, and security considerations for the Internet of Things.

### Indicative Module Content

Basic concepts of the Internet of Things and its enabling technologies. Students will be exposed to various techniques and approaches to developing software for embedded, restricted and interconnected systems. Approaches to hardware and software interfacing with sensors, displays and cloud based data collection and visualisation. Developing sensor systems for environmental, system or behaviour monitoring. Students will also evaluate the associated legal considerations and security measures.

### Module Delivery

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

Module Ref:

CM3142 v1

**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: A coursework including the design and implementation of an IoT system.

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

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 Colin Dow. Internet of Things Programming Projects: Build modern IoT solutions with the Raspberry Pi 3 and Python Paperback. Packt Publishing. 2018
- 2 Gary Smart. Practical Python Programming for IoT: Build advanced IoT projects using a Raspberry Pi 4, MQTT, RESTful APIs, WebSockets, and Python 3. Packt Publishing. 2000
- 3 Cox, Tim; Fernandes, Steven Lawrence. Raspberry Pi 3 cookbook for Python programmers : unleash the potential of Raspberry Pi 3 with over 100 recipes. Packt Publishing. 2018
- 4 Batalla, Jordi Mongay; Mastorakis, George; Mavromoustakis, Constandinos X.; Pallis, Evangelos. Beyond the Internet of Things : everything interconnected Springer. 2017
- 5 Buyya, Rajkumar; Dastjerdi, Amir Vahid. Internet of things : principles and paradigms. Cambridge, MA 2016