



## **Module Specification**

### **Internet of Things**

Version: 2025-26, v2.0, 11 Jul 2023

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## Part 1: Information

**Module title:** Internet of Things

**Module code:** UFCE4T-15-2

**Level:** Level 5

**For implementation from:** 2025-26

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Computer Sci & Creative Tech

**Partner institutions:** None

**Field:** Computer Science and Creative Technologies

**Module type:** Module

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** The Internet of Things (IoT), is the connecting and internetworking of multiple devices over the internet, allowing them to communicate with us, applications, and each other. The module will provide students with the opportunity to explore a range of IoT devices and communication technologies before developing their own practical solution to a given IoT case study.

**Features:** Not applicable

**Educational aims:** This module aims to provide learners with an in-depth appreciation of the Internet of Things (IoT) and the tools to design and develop their own multi-device IoT Solution to meet a project requirement.

In completion of this module learners should be able to plan, develop and test a secure multi-client IoT solution to meet a defined scenario using suitable IoT enabled hardware and software.

Software languages used in this module could include Windows IOT Core, Python, Node/Node Red, C.

Suitable IoT hardware platforms could include Raspberry Pi, Arduino, BeagleBoard, Intel Edison, Google Coral etc.

As well as the technical aspects of IoT, students/apprentices will also be able to identify key legislation impacting the publication of IoT Solutions, eg Data Governance (IPO, GDPR, Data Protection), privacy policies, use of data, monitoring etc.

**Outline syllabus:** Delivery will cover modern system architecture, key technologies, and legal, social and ethical/moral implications to implementing these technologies. Syllabus topics could include

System architecture (e.g. centralised and decentralised)

Sensing technologies (e.g. sensors and actuators)

Machine-to-Machine (M2M) Communication (eg Wireless technologies,

Messaging/communication protocols)

Hardware and software platforms for IoT

Legal, social, ethical, and moral implications of IoT e.g. IoT security and privacy

Effective cyber security in relation to IoT

Data security and management with regards to IoT

Students will be able to cultivate independent technical judgement in the use of techniques and tools associated with IoT devices and M2M communication

protocols. As well as being able to develop the ability to think conceptually and translate concepts into reality, learners will go beyond programming web applications, and develop skills in security, penetration testing and user experience.

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** Introductory lectures covering the fundamentals and technical underpinning of the module for the first assessment before progressing onto practical delivery through a series of lessons, workshops and practical tasks in the classroom to develop the tools and techniques required to complete the practical assessment for this module. Students are also provided with access to a suitable hosting platform and University networking facilities for the completion of this module.

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Identify the impact of current legislation on IoT Solutions and explain common security risks present when building and publishing IoT solutions and best practice authentication techniques.

**MO2** Appraise key M2M protocols and IoT hardware/software solutions and apply as appropriate

**MO3** Plan, develop and test a secure IoT solution to meet a defined scenario using suitable IoT enabled hardware/software and M2M communications.

**MO4** Use a variety of sensors to monitor, record data and trigger actions to empower a complete IoT solution

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufcfdn-15-3.html) via the following link <https://uwe.rl.talis.com/modules/ufcfdn-15-3.html>

## Part 4: Assessment

**Assessment strategy:** This module consists of a single assessment in the form of a practical IoT project and associated documentation, including:

- Evidence of planning and design of a IoT solution to support an agreed scenario (eg Schematics, BOM)
  - Development and testing of a secure IoT solution consisting of a range of hardware & sensors
  - Deploying and test a completed IoT solution
  - Documenting complete IoT solution (eg Deployment guide, technical manual)
- Understanding and adhering to relevant data and security laws and legislation.

Resit opportunities follow the same format as the first sit. Due to the size/nature of the IoT project a re-working for existing project may be used.

### Assessment tasks:

#### Portfolio (First Sit)

Description: Practical Skills Assessment -Design, build, and test an IoT solution

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

#### Portfolio (Resit)

Description: Practical Skills Assessment -Design, build, and test an IoT solution

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

## **Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Digital and Technology Solutions (Network Engineer) {Apprenticeship-UCW} [UCW]  
BSc (Hons) 2023-24

Digital and Technology Solutions (Software Engineer) {Apprenticeship-UCW} [UCW]  
BSc (Hons) 2023-24

Digital and Technology Solutions (Data Analyst) {Apprenticeship-UCW} [UCW] BSc  
(Hons) 2023-24

Digital and Technology Solutions (Cyber Security Analyst) {Apprenticeship-UCW}  
[UCW] BSc (Hons) 2023-24

Digital and Technology Solutions (Software Engineer) {Apprenticeship-GlosColl}  
[GlosColl] BSc (Hons) 2023-24