



Module Specification

Internet of Things Engineering

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Part 1: Information

Module title: Internet of Things Engineering

Module code: UFMFNN-15-3

Level: Level 6

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

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: This module considers infrastructure technologies, applications and standards used in the design and implementation of sensor networks, with a focus on their use in applications for the Internet of Things.

Features: Not applicable

Educational aims: Students will gain practical design and implementation skills and develop their understanding of constraints associated with current technologies and

potential solutions alongside investigating the challenges of data aggregation, interoperability and security that developers face as smart systems, based on intelligent monitoring of data gathered from networked embedded devices become more sophisticated and pervasive.

In addition, the educational experience may explore, develop, and practise but not formally assess the following:

Understanding of the need for high-level professional and ethical conduct.

Outline syllabus: The syllabus covers topics such as:

The IoT applications

Constraints and issues: power management, data aggregation, interoperability, timeliness and security

Enabling Technologies

Networking, protocols and routing

Deployment and practical implementation issues

Data aggregation

Sensors and sensors technology

Real time, low power operating systems

Automatic identification and data transfer (AIDC), RFID

Trust, security and privacy

Programming, debugging real time implementations in both software and hardware

Part 3: Teaching and learning methods

Teaching and learning methods: See educational aims and assessment.

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

MO1 Develop and demonstrate an understanding of the use of sensor networks within the context of the Internet of Things (IoT), taking account of technological, commercial and social constraints

MO2 Understand, critically discuss and evaluate issues related to power, timeliness, data aggregation, interoperability and security of IoT systems from a technology perspective

MO3 Develop and demonstrate understanding of network architectures and key wireless enabling technologies used in IoT systems

MO4 Demonstrate knowledge of underlying mathematical and networking principles, and topologies in the design and development of real time IoT applications

MO5 Demonstrate the ability to use development tools to design, implement, deploy and test systems

MO6 Apply research and problem-solving skills in the analysis, design and development of a system for the Internet of Things

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/index.html) via the following link <https://uwe.rl.talis.com/index.html>

Part 4: Assessment

Assessment strategy: The assessment for this module is as follows:

Laboratory-based project: students will work in group to develop a practical IoT application. They will present their work and demonstrate it in the lab at the end of the term.

Individual report: Students will be required to research an application of IoT and submit a report describing their findings.

Feedback will be provided during the lab sessions.

Resit is the same as the first sit

Resit deliverable(s) will be scaled appropriately to group size and task complexity

Assessment tasks:

Practical Skills Assessment (First Sit)

Description: Lab-based group presentation (10 mins) and demonstration (10-15 mins)

Weighting: 50 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO1, MO3, MO4, MO5, MO6

Report (First Sit)

Description: Individual report (1500 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO6

Practical Skills Assessment (Resit)

Description: Lab-based group presentation (10 mins) and demonstration (10-15 mins)

Resit deliverable(s) will be scaled appropriately to group size and task complexity

Weighting: 50 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested:

Laboratory Report (Resit)

Description: Individual report (1500 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electronic and Computer Engineering [SHAPE] BEng (Hons) 2023-24

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