MODULE SPECIFICATION

Part 1: Information			
Module Title	Internet of Things Engineering		
Module Code	UFMFNN-15-3	Level	Level 6
For implementation from	2019-20		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module type:	Standard		

Pre-requisites	None
Excluded Combinations	None
Co- requisites	None
Module Entry 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.

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

Teaching and Learning Methods: See educational aims and assessment.

Part 3: Assessment

Your achievements in the module will be assessed in two components:

Component A:
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.

Component B:
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.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Individual report (1500 words)
Practical Skills Assessment - Component A	✓	50 %	Lab-based group presentation (10 mins) and demonstration (10-15 mins)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Individual report (1500 words)
Practical Skills Assessment - Component A	✓	50 %	Lab-based individual presentation (10 mins) & demonstration (10-15 mins)

Part 4: Teaching and Learning Methods

Learning Outcomes

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

Module Learning Outcomes	Reference
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	MO1
Understand, critically discuss and evaluate issues related to power, timeliness, data aggregation, interoperability and security of IoT systems from a technology perspective	MO2
Develop and demonstrate understanding of network architectures and key wireless enabling technologies used in IoT systems	MO3
Demonstrate knowledge of underlying mathematical and networking principles, and topologies in the design and development of real time IoT applications	MO4
Demonstrate the ability to use development tools to design, implement, deploy and test systems	MO5
Apply research and problem-solving skills in the analysis, design and development of a system for the Internet of Things	MO6

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
Total Scheduled Learning and Teaching Hours:	36
Hours to be allocated	150
Allocated Hours	150

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/index.html

Part 5: Contributes Towards

This module contributes towards the following programmes of study: