Module: Internet of Things 161

Module name:	Internet of Things 161
Code:	IOT161
NQF level:	6
Type:	Core – Diploma in Information Technology (all stream)
Contact Time:	34 hours
Structured Time	6 hours
Self-directed time	40 hours
Notional hours:	80 hours
Credits:	8
Prerequisites:	None

Purpose

This module is an introduction to the concepts Internet of Things (IoT). The module will focus on introducing students to developing and deploying solutions using IoT, focusing on capturing data from a trusted device and sending the data to a cloud platform where it can be exploited by the many IoT cloud services available. The module will explore all the steps required to create a basic IoT solution using popular embedded devices like the Raspberry Pi, and cloud-based IoT Platforms like the Arduino, Node Red. The module assumes students will have basic programming skills and scripting language proficiency.

Learning Outcomes

Upon successful completion of this module, the student will be able to:

- Demonstrate detailed knowledge of the history of IoT, application development environment that engages IoT on both the device and the cloud.
- Demonstrate an understanding of the different forms of the application of IoT Devices and Sensors.
- Demonstrate the ability to evaluate, select and apply the 9 IoT settings.
- Demonstrate an understanding of the installation, setup, and utilization of IoT on the cloud by using simulation software.
- Demonstrate detailed knowledge of the utilization of variables in simulation software.
- Demonstrate the ability to evaluate, select and apply different functions but also to read and write to files within simulation software.
- Demonstrate the ability to evaluate, select and apply the publishing and subscribing of HTTP data over MQTT.

Assessment

- Continuous evaluation of theoretical work through written assignment, a formative, and a summative test.
- Continuous evaluation of project work, where the student must design, manage and report on the evaluation of testing methodologies and the selection of an appropriate methodology for a given scenario, justifying the choice made with well-formed arguments and evidence.
- Final assessment through a written examination.
- The assignments or projects collectively will count 30% of your class mark.
- All tests will collectively account for 70% of your class mark.
- Your class mark contributes 30% towards your final mark for the subject, while the final assessment accounts for 70% of your final mark.

Teaching and Learning

Learning materials

Prescribed Book (EBSCO)

- 🕮 **Watts, S. ed., 2016. The Internet of Things (IoT): Applications, technology, and privacy issues. Nova Publisher's.**
- 🕮 **Simulation Software**

Additional Material

- 🕮 **Waher, P., 2015. Learning internet of things: Explore and learn about Internet of things with the help of engaging and enlightening tutorials designed for Raspberry Pi. Packt publishing.**

Learning activities

Learning will be facilitated by the lecturer with student centred activities that involve problem based learning where pupils are presented with challenges that replicate the situation in the real world environment. This will be achieved through a combination between presentation of theoretical concepts, guided exercises, group work and discussions during the module. One mandatory assignment and one project must be completed during the course.

Notional learning hours

Activity	Units	Contact Time	Structured Time	Self-Directed Time
Lecture		27.0		13.0
Formative feedback		3.5		
Project	1	3.5		9.0
Assignment	1			3.0
Test	2		4.0	8.0
Exam	1		2.0	7.0
		34.0	**6.0**	**40.0**

Syllabus

- An overview of IoT concepts
- Devices and sensors
- IoT Settings
- Introduction to cloud based IoT
- Introduction to simulation software
- Lower level programming of IoT