

Module: Internet of Things 261

Module name:	Internet of things 261
Code:	IOT261
NQF level:	6
Type:	Fundamental – Diploma in Information Technology (Infrastructure stream)
Contact time:	34 hours
Structured time:	6 hours
Self-directed time:	40 hours
Notional hours:	80 hours
Credits:	8
Prerequisites:	IOT161

Purpose

This course is an introduction to developing and deploying solutions for the Internet of Things (IoT). It will focus on introducing the concepts and architecture of IoT applications, networking technologies and development kits. It will explore all the steps required to create a basic IoT solution using popular embedded devices.

Outcomes

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

- Demonstrate detailed knowledge of an application development environment that engages IoT, on both the device and the cloud.
- Identify and analyse IoT security and privacy risks, and concept design secure hardware and software.
- Create a basic IoT solution by leveraging pre-built blocks of code that abstracts and speeds the development process.
- Create applications that leverage connectivity and analytics as part of an integrated IoT platform.
- Design and implement the circuits they need to interact with basic sensors and actuators
- Explore options to ensure solutions makes best use of the captured data and interfacing with peripherals, using knowledge of interfacing standards.
- Produce a viable IoT concept design that solves a problem, is ready to prototype and test, and has an identified route to market.
- Work effectively in a team or group, and to take responsibility for his or her decisions and actions and the decisions and actions of others within well-defined contexts, including the responsibility for the use of resources where appropriate

Assessment

Assessment is performed using a variety of instruments:


- 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 books (EBSCO)

 **Arduino Projects Book (2012) under Creative commons license**

Additional material

 **McManus S, Cook M, (2014). Raspberry Pi for Dummies 2nd Edition, For Dummies Series. [ISBN-9781118904916]**

 **Heath S. (2012). Embedded systems design 2nd Edition, [ISBN-9780080477565]**

 **Stewart Becky, Adventures in Arduino [ISBN-9781118948477]**

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

- Introduction to Smart Connected Products
- Trends and Security in IoT

- Detailed explanation of the ABCD architecture
- Basics of Electricity
- Prototyping using development kits
- Hardware requirements
- Installation and configurations
- Programming the hardware
- Creating Arduino circuits