

## Module: Internet of Things 261

<b>Module name:</b>	Internet of things 261
<b>Code:</b>	IOT261
<b>NQF level:</b>	6
<b>Type:</b>	Fundamental – Diploma in Information Technology (Infrastructure stream)
<b>Contact time:</b>	48 hours
<b>Structured time:</b>	8 hours
<b>Self-directed time:</b>	24 hours
<b>Notional hours:</b>	80 hours
<b>Credits:</b>	8
<b>Prerequisites:</b>	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 assignments, formative tests, and a summative test.

- Continuous evaluation through tracking of progress, offering support, guidance and provision of constant stream of opportunities to prove mastery of subject material and pursuing more challenging work as they master the basics.
- Final assessment through an examination.

## 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.

### Notional learning hours

Contact	Distance	Other	Type of learning activities	% Learning
y	y	n	Lectures (face-to-face, limited interaction or technologically mediated)	40%
y	y	n	Tutorials: individual groups	20%
n	y	n	Syndicate groups	10%
n	y	n	Independent self-study of standard texts and references (study guides, books, journal articles)	10%
n	y	n	Independent self-study of specially prepared materials (case studies, multi-media, etc.	20%

### 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