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MODULE DESCRIPTOR

Module Title

Exploring Computing Devices

Reference	CM1109	Version	1
Created	September 2020	SCQF Level	SCQF 7
Approved	March 2021	SCQF Points	15
Amended		ECTS Points	7.5

Aims of Module

To enable students to develop interactive physical systems using software development tools and single-board computers that are capable of processing data captured from physical sensors and controlling actuators for output.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Demonstrate knowledge of the structure and organisation of computer operating systems, and identify the purpose of typical hardware and software components.
2	Describe the main components of a computer system, how software executes on a computer and have an introduction to associated legal, social, ethical, professional and security issues.
3	Explain the theories and issues involved in the control of a computer system.
4	Develop interactive programs for single-board computer systems that use inputs from sensors and control a variety of physical outputs.

Indicative Module Content

Main hardware and software components of physical computer systems; legal, social, ethical, professional, and security issues of physical computing; Arduino IoT hardware platform; Javascript software development using robotic and IoT libraries for interfacing with various sensors and actuators with appropriate variables, data types, and interactive control.

Module Delivery

Key concepts are introduced through the lectures. The main emphasis of the course will be focused on the lab sessions, which will create a flexible teaching session where individual lab assignments and group development will be interspersed with demonstrations of current techniques and practices allowing students to develop their understanding of the material and software development skills.

Module Ref:	CM1109 v1

Indicative Student Workload	Full Time	Part Time
Contact Hours	30	N/A
Non-Contact Hours	120	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	100%	Outcomes Assessed:	1, 2, 3, 4
Description:	A practical coursework that explores the use of electronics, IOT prototyping boards and software development to design and implement a solution to a given problem.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

An overall minimum grade D is required to pass the module.

Module Grade	Minimum Requirements to achieve Module Grade:
A	The student needs to achieve an A in C1.
B	The student needs to achieve an B in C1.
C	The student needs to achieve an C in C1.
D	The student needs to achieve an D in C1.
E	The student needs to achieve an E in C1.
F	The student needs to achieve an F in C1.
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	WALDRON, R. and Backstop Media. 2015.JavaScript Robotics: Building NodeBots with Johnny-Five, Raspberry Pi, Arduino, and BeagleBone
2	Rinehart, M., 2015. Javascript object programming
3	Stallings, W., 2012. Computer Organization and Architecture. 9th ed. Pearson Education.
4	Dunbar, N., 2020. Arduino Software Internals: A Complete Guide to How Your Arduino Language and Hardware Work Together
5	Seneviratne, P., 2017. Building Arduino PLCs: The Essential Techniques You Need to Develop Arduino-Based PLCs