MODULE SPECIFICATION

Part 1: Information			
Module Title	Digital Design		
Module Code	UFCFCS-30-2	Level	Level 5
For implementation from	2021-22		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Computer Science and Creative Technologies
Department	FET Dept of Computer Sci & Creative Tech		
Contributes towards	Computer Science BSc (Hons) 2020-21		
Module type:	Standard		
Pre-requisites	Introductory Audio Programming 2020-21, Principles of Programming 2020-21		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
Pre-requisites: students must take one out of UFCFF4-30-1 Introductory Audio Programming or UFCFHS-30-1 Principles of Programming Digital Design combines the approaches of Physical Computing and Product Design. The course makes no assumes that students have little or no prior knowledge in one or more of the associated subjects of electronic control and feedback systems but requires some previous programming experience. The module takes an active learning approach, with most of the real work happening in the workshops and programming and interacting with your peers and tutors. A broad overview of tools and techniques used in Physical Computing and Product Design will be provided, with emphasis on mechanisms. **Educational Aims:** This module aims to build on the students' programming knowledge and extend that into the area of smart devices. **Outline Syllabus:** Prototyping - Lo-fi and Hi-fi

Electrical circuit design
- Paper circuits, E-textiles, and Printed Circuit Boards (PCBs)

PCB design and fabrication
- Tools such as KiCAD and Eagle for PCD design
- Soldering and other tools for PCB manufactory

2D Graphics Software and 3D Computer Aided Design tools for product design, e.g. Adobe Illustrator and Solidworks.

Prototype design Physical Systems, including laser cutting and 3D printing.

Sensors and actuators, e.g. buttons, capacitive touch, LEDs, conductive threads, electric motors, gears, planar linkages, and bearings.

Introduction to industrial design in the context of smarts systems.

Engineering methodologies for smart devices

Teaching and Learning Methods: Laboratory exercises will allow students to gain familiarisation with the tools and techniques required for the implementation and verification of safe embedded systems.

Students will be expected to demonstrate self-direction and originality in their learning which will be facilitated through student directed tutorials.

The lecture series will be supported by weekly practical sessions in which the students have the opportunity to apply some of the concepts discussed during the lecture series. The practicals will allow the students to explore and debug mobile devices and/or device simulations using a range of tools.

Part 3: Assessment

Students will be supported in their learning through formative assessment, achieved through the demonstration and discussion of their solutions to the graded problems in the worksheets. The sign off sheet will be handed in as evidence of their work. (A&B)

Students will also be assessed in their effective use and understanding of the tools and technologies that they utilize.

Students will be assessed by gradually harder assessments.

For the referral coursework the student will be required to provide evidence of their achievements on the practical worksheets rather than an in-person demonstration.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Practical Skills Assessment - Component A		50 %	Practical individual coursework demonstration and signoff
Group work - Component B	✓	50 %	Practical group work, with continual assessment and sign off
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Practical Skills Assessment - Component B	✓	50 %	Assessment and feedback of product development, with final demonstration. Submission will include video for demonstration.

Practical Skills Assessment - Component A		50 %	Evidence of completed practical worksheets. The evidence will be provided by the submission of a video, or a demonstration or via some other verifiable method.

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will be able to:

	Module Learning Outcomes
MO1	Demonstrate design process methodologies and how they are used in human-centered design approach
MO2	Discuss the characteristics and processes involved in designing a smart digital device.
MO3	Design, specify, and build a range of electrical circuits.
MO4	Plan and create lo-fi and hi-fi prototyping to explore, test and validate smart digital device concepts
MO5	Apply a range of design tools and methods within categories of design process and types of design communication for smart digital devices
MO6	Analyse a product and related system in the context of sustainability principles

Contact Hours

Contact Hours	
Independent Study Hours:	
Independent study/self-guided study	228
Total Independent Study Hours:	228
Scheduled Learning and Teaching Hours:	
Face-to-face learning	72
Total Scheduled Learning and Teaching Hours:	72
Hours to be allocated	300
Allocated Hours	300

Reading List

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

https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Frl.talis.com%2F3%2Fuwe%2Flists%2FD3BAAFB1-0018-68C8-62EC-73947AB7B362.html%3Flang%3Den-

	GB%26login%3D1&data=02%7C01%7CElias.Pimenidis%40uwe.ac.uk%7Ccd913533534e403ebc0908d7afb4b1ad%7C07ef1208413c4b5e9cdd64ef305754f0%7C0%7C0%7C637171062922461404&sdata=dJoJyB3U%2BbuQnXODWh5xpkrc7cKVD4ecmgwLNqNmwh4%3D&reserved=0