Principles and Applications of Microcontrollers

Module Information

2022.01, Approved

Summary Information

Module Code	5505ICBTEL
Formal Module Title	Principles and Applications of Microcontrollers
Owning School	Engineering
Career	Undergraduate
Credits	15
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
International College of Business and Technology

Learning Methods

Learning Method Type	Hours
Lecture	30
Practical	15
Tutorial	3
Workshop	12

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit

APR-PAR	PAR	April	12 Weeks
JAN-PAR	PAR	January	12 Weeks
SEP-PAR	PAR	September	12 Weeks

Aims and Outcomes

Aims	This unit will provide learners with an understanding of the applications of microcontroller based systems and will develop the skills required to design, write and test software and interface such systems.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Describe microcontroller internal architecture and based systems and interpret the design specification and requirement to solve an engineering problem(s), and choose the best fit microcontroller to design and solve the identified problem.
MLO2	2	Develop the microcontroller suitable hardware by interconnecting sensors and actuators to solve engineering problem and interface with the software to control the system
MLO3	3	Apply appropriate development tools (such as Programming IDE tools, and debug tools) to implement software that is fit for purpose.
MLO4	4	Demonstrate knowledge of how to develop microelectronic systems to meet the legal, ethical, and social aspects of the environment they are intended to work within and present the developed system by using appropriate tools and communication.

Module Content

Outline Syllabus	The relative merits of several commercially available microcontrollers e.g. 68HC11, ATMEL, PIC. A key exemplar for an embedded system for example an advanced PIC microcontroller will be discussed in depth, to outline the internal (Harvard) architecture, hardware capabilities and instruction set.A detailed consideration of the onboard features will be addressed:Programming the ADC (Analogue to Digital Converter) Serial communications, the USART, synchronous and asynchronous communications, IIC to interface with PC Programming the PWM module.Programming the on board timers.Programming EEPROM
Module Overview	
Additional Information	

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Examination	50	2	MLO1, MLO4
Report	Coursework	50	0	MLO2, MLO3

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Karl Jones	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings