Digital and Embedded Systems

Module Information

2022.01, Approved

Summary Information

Module Code	5501USST
Formal Module Title	Digital and Embedded Systems
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
University of Shanghai For Science and Technology

Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	44

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-PAR	PAR	January	12 Weeks

Aims and Outcomes

Aims	The module aims to broaden the students' knowledge and understanding of digital circuit design, and examines modern microcontroller architectures and the interface requirements to external systems. It also aims to provide students with practical skills necessary to design, analyse and implement electronic circuits controlled by microcontrollers and finite state machines

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Appraise and analyse electronic circuit operation and design
MLO2	2	Design, analyse and implement finite state machine based digital circuits
MLO3	3	Describe and identify suitable interfaces for modern microcontroller/embedded systems
MLO4	4	Appraise and select appropriate hardware, software platforms and interface considering power, cost and capability requirements
MLO5	5	Design complete integrated embedded systems with external sensors and actuators

Module Content

Outline Syllabus	Review of Boolean algebra and Karnaugh maps.Synchronous sequential state machine design and analysis, including Mealy, Moore and mixed type circuits.Asynchronous sequential design.Identify the advantages and disadvantages of various processors available on the market.Research the costs of mass production identifying the power and capability of the devices.Plan for the power requirements of embedded systems, considering different use case requirements.Create embedded systems that interface with various sensors, both analogue and digital, ensuring that inputs are buffered to protect the processor for hazardous conditions. Integrate processors with control devices e.g. Servos, Motors
Module Overview	
Additional Information	This module introduces the students to digital electronics and the application of Embedded processors in electrical circuits.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Exam	70	2	MLO1, MLO2, MLO3, MLO4
Practice	D&E Systems Assignment	30	0	MLO2, MLO4, MLO5

Module Contacts