

Summary Information

Module Code	6306ELE
Formal Module Title	Electronic Systems Integration
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	44

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	The module aims to provide the students with advanced knowledge and skills of electronics systems design, to enable students to design practical applications with the integration of analogue and digital systems.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Evaluate digital system design and integration including ALUs and FSMs.
MLO2	2	Design, simulate, test and implement programmable logic based systems using VHDL.
MLO3	3	Design and implement microprocessor based analogue and digital systems.
MLO4	4	Design peripheral components for digital and analogue systems power supplies, bus structures, memories and interfacing/signal processing circuits.

Module Content

Outline Syllabus	<p>1. FPGA based designDesign ALU and FSM using reconfigurable systems. Combinational, synchronous and asynchronous sequential design in programmable logic. Considerations for high speed systems, metastability and clock distribution, transmission line considerations. Input and output options. Introduction to 2. VHDL based designHardware Descriptor Language (HDL) programming. Design, test, simulation and implementation on a Xilinx Spartan 3E FPGA, using the proprietary CAD tool Xilinx ISE.3. Microprocessor based designDesign and implementation of digital systems with microcontrollers; I/O in digital systems, on-board serial data communication with peripheral ICs, and offboard communication with a host or other computing entity via, for example, USB or radio telemetry; Buses and bus timing; Memory device technology and interfacing;4. Systems integrationsIntegrated I/O Interfaces, for example, ADC, UART, SPI, I2C and Interrupt Controller.Development platforms for digital systems, JTAG development and debugging environments.Design of advanced analogue data acquisition and filtering systems. Measurement of information, A/D converters, source coding, circuits and techniques for error detection and correction in digital systems, D/A converters, control and drive circuits.Design of power supplies for digital and analogue systems.</p>
Module Overview	
Additional Information	This Level 6 module will provide students with advanced skills to design and integrate electronic systems in practical applications.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	Report	100	0	MLO1, MLO2, MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings

Partner Module Team

Contact Name	Applies to all offerings	Offerings