Liverpool John Moores University

Title:	Electronics System Integration
Status:	Definitive
Code:	**6109ENG** (116961)
Version Start Date:	01-08-2018
Owning School/Faculty:	Electronics and Electrical Engineering
Teaching School/Faculty:	Electronics and Electrical Engineering

Team	Leader
Wei Zhang	Y
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Academic Level:	FHEQ6	**Credit Value:**	20	**Total Delivered Hours:**	84
Total Learning Hours:	200	**Private Study:**	116		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	21
Practical	63

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Test	In-Class test	40	
Portfolio	Prac lab	Practical lab & assignment	60	

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.

Learning Outcomes

After completing the module the student should be able to:

1	Gain knowledge of electronic system design and integration
2	Design and implement advanced digital systems.
3	Design, analyse and implement advanced analogue systems
4	Design, test, simulate and implement programmable logic based systems
5	Design power supplies for digital and analogue systems
6	Use CAD tools for circuit and PCB design and simulation

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

In-class test	1				
Practical lab & assignment	2	3	4	5	6

Outline Syllabus

Design 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 Hardware Descriptor Language (HDL) programming. Use of embedded microprocessors in FPGA designs. Design, test, simulation and implementation on a Xilinx Spartan 3E FPGA, using the proprietary CAD tool Xilinx ISE.
Design and implementation of digital systems with FPGA and microcontrollers; I/O in digital systems, on-board serial data communication with peripheral ICs, and off-board communication with a host or other computing entity via, for example, USB or radio telemetry; Buses and bus timing; Memory device technology and interfacing; Integrated 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.
Printed Circuit Board design techniques and manufacturing considerations

Learning Activities

A combination of lectures, practical work and tutorials.

Notes

This Level 6 module will provide students with advanced skills to design and integrate electronic systems in practical applications.