

### Summary Information

Module Code	6606SLT
Formal Module Title	Further Electronic Design
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

### Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

### Partner Teaching Institution

Institution Name
SLIIT Academy (Pvt) Ltd

### Learning Methods

Learning Method Type	Hours
Lecture	11
Practical	22
Tutorial	11

### Module Offering(s)

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

## Aims and Outcomes

Aims	This module is intended to provide students with a good appreciation of the mathematical concepts necessary to apply digital signal and image processing algorithms to a range of engineering problems.
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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 using FSMs.
MLO2	2	Create programmable logic based systems using VHDL.
MLO3	3	Design and implement microprocessor based systems.
MLO4	4	Analyse peripheral components for digital and analogue systems.

## Module Content

Outline Syllabus	Design FSM using reconfigurable systems. Combinational, synchronous and asynchronous sequential design in programmable logic. Considerations for highspeed systems, metastability and clock distribution, transmission line considerations. Input and output options. Hardware Descriptor Language (HDL) programming. Design of FPGA circuit using VHDL. Design and implementation of digital systems with microcontrollers. JTAG development and debugging environments.
Module Overview	
Additional Information	<p>General Notes This Level 6 module will provide students with further skills to design and electronic circuitry in practical applications. UNESCO Sustainable Development Goals Quality Education Partnerships for the Goals UK SPEC AHEP 4CEng.</p> <p>M1 Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering.</p> <p>M2 Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed.</p> <p>M3 Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed.</p> <p>M4 Select and critically evaluate technical literature and other sources of information to solve complex problems.</p> <p>M5 Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.</p> <p>M6 Apply an integrated or systems approach to the solution of complex problems.</p> <p>M7 Evaluate the environmental and societal impact of solutions to complex problems (to include the entire lifecycle of a product or process) and minimise adverse impacts.</p> <p>M8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.</p> <p>M10 Adopt a holistic and proportionate approach to the mitigation of security risks.</p> <p>M11 Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.</p> <p>M12 Use practical laboratory and workshop skills to investigate complex problems.</p> <p>M13 Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.</p> <p>M14 Discuss the role of quality management systems and continuous improvement in the context of complex problems.</p> <p>IEng.B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.</p> <p>B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.</p> <p>B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.</p> <p>B4 Select and evaluate technical literature and other sources of information to address broadly-defined problems.</p> <p>B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.</p> <p>B6 Apply an integrated or systems approach to the solution of broadly-defined problems.</p> <p>B7 Evaluate the environmental and societal impact of solutions to broadly-defined problems.</p> <p>B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.</p> <p>B10 Adopt a holistic and proportionate approach to the mitigation of security risks.</p> <p>B11 Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.</p> <p>B12 Use practical laboratory and</p>

## 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
Clifford Mayhew	Yes	N/A

**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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