Liverpool John Moores University

Title:	Microelectronic System Design
Status:	Definitive
Code:	**7304ELEM** (121638)
Version Start Date:	01-08-2019
Owning School/Faculty:	Electronics and Electrical Engineering
Teaching School/Faculty:	Electronics and Electrical Engineering

Team	Leader
Wei Zhang	Y

Academic Level:	FHEQ7	**Credit Value:**	20	**Total Delivered Hours:**	33
Total Learning Hours:	200	**Private Study:**	167		

Delivery Options
Course typically offered: Semester 1

Component	Contact Hours
Lecture	11
Practical	22

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Report	Report. 4500 words	100	

Aims

The module aims to gain knowledge and understanding of a range of advanced VLSI design and analysis methods and to develop the design and test techniques required for modern digital microelectronic systems.

Learning Outcomes

After completing the module the student should be able to:

1	Critically appraise concepts, principles and theories of microelectronic circuit and system design to the appropriate level.
2	Critically appraise appropriate hardware and software used in the field of Microelectronic System Design.
3	Develop advanced skills in microelectronic system design, at the gate, RTL and system level.
4	Critically evaluate Microelectronic System Design, to enable appreciation of its scientific and engineering context, and to support their understanding of historical, current, and future developments and technologies.

Learning Outcomes of Assessments

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

Report	1	2	3	4

Outline Syllabus

1. Verilog based design
Review of combinational and sequential circuit design.
Semi-custom digital system design, FPGA based digital system design.
Digital system design, simulation and synthesis using Verliog HDL.

2. Microelectronic system design
Microelectronic system design at register and system levels.
Considerations for high speed systems, metastability and clock distribution
Design of test bench and build-in test structure.
Simulation, implementation and testing of medium scale systems.
Design of microelectronic systems utilizing embedded microprocessors and memories.
Emerging technologies, future important devices, new design methods.

Learning Activities

A combination of lectures and practical work.

Notes

This level 7 module gives the student an advanced knowledge of the design and test techniques required for modern digital microelectronic systems. Extensive practical designs are carried out with the help of modern ECAD software and hardware development boards.