Liverpool John Moores University

Title:	VLSI Design
Status:	Definitive
Code:	**7313ELEM** (121639)
Version Start Date:	01-08-2019

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Electronics and Electrical Engineering

Team	Leader
David Harvey	Y

Academic Level:	FHEQ7	**Credit Value:**	10	**Total Delivered Hours:**	40.5
Total Learning Hours:	100	**Private Study:**	59.5		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Lecture	22
Practical	11
Tutorial	6

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Examination	100	1.5

Aims

To develop skills related to VLSI design.
To develop advanced skills in VLSI circuit design, at the transistor and gate levels.
To develop expertise in modern digital electronic circuit design and testing.

Learning Outcomes

After completing the module the student should be able to:

1   Design complex modern digital electronic circuits.
2   Realize state-of-the-art MOS design methods and design rules
3   Comprehensively apply the principles of self testing within complex VLSI circuit designs

Learning Outcomes of Assessments

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

Examination   1   2   3

Outline Syllabus

Review of clocked and pulse mode circuits, sequential circuit design. Asynchronous digital circuit design, fundamental mode circuit design. Design for test, Built-in Self Test (BIST/BIT), Boundary Scan testing, IEEE 1149.1 and variants.
Review of MOS technology, properties of MOS circuits, MOS Design rules, Stick diagram design, Transistor level design of MOS logic functions.
Semi-custom design, Selection of PLA/PLD/CPLD/FPGA/ROM based designs.
Languages for VLSI Design, levels of design and simulation, introduction to languages for VLSI design, eg VHDL,Verliog, Chipwise, Palasm, Abel.
Emerging technologies, future important devices, new design methods.

Learning Activities

Lectures supported by handouts & tutorials where appropriate.
Practical sessions will use software packages (eg Chipwise, Xilinx) for circuit design and development.

Notes

This level 7 module gives the student an advanced knowledge of the design and test techniques required for modern digital electronic integrated circuits, at the transistor, register and silicon level. Practical design is carried out with the help of modern ECAD software.