

## Liverpool John Moores University

Title: Consumer Electronics  
Status: Definitive  
Code: **6307ELE** (121438)  
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering  
Teaching School/Faculty: Engineering

Team	Leader
Jian Zhang	Y
Zhigang Ji	

<b>Academic Level:</b>	FHEQ6	<b>Credit Value:</b>	10	<b>Total Delivered Hours:</b>	41
<b>Total Learning Hours:</b>	100	<b>Private Study:</b>	59		

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Practical	6
Tutorial	11

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Exam	100	2

### Aims

*To gain knowledge and understanding of modern consumer electronic devices and systems. To foster the awareness of the challenge and opportunity for the microelectronic industry*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate knowledge of modern consumer electronic devices and systems
- 2 Analyse the performance of advanced devices and systems
- 3 Show awareness of MOS qualification techniques
- 4 Argue the future challenge and opportunity in this rapidly changing area

### **Learning Outcomes of Assessments**

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

Exam	1	2	3	4
------	---	---	---	---

### **Outline Syllabus**

*Nano-meter transistors and microprocessors: Moore's law, leakage, short channel effects, challenges and opportunities*

*Memories: SRAM and DRAM, bitcell structures, System, Read and Write, Noise Margin, Device Variation and mismatch.*

*Flash memory: Structure, programming, charge storage, erasing, reading, memory retention and endurance, the 3D future generation*

*Photo-detectors: Structure and principle, solar cells, sensitive volume, PIN and APD, bandwidth and noises*

*CCDs and Cameras: Structure, two phase, three phase, carrier generation, storage, transferring and detection*

*TFTs and LCDs: Amorphous-Si TFTs and Poly-Si TFTs, Passively addressed LCDs and actively addressed LCDs, Leakage and speed.*

*Future of microelectronic and computer industries: New materials and devices, International Roadmap*

### **Learning Activities**

Typically by a series of lectures, tutorials, researching for information and analysis.

### **Notes**

This module will provide undergraduates with a comprehensive understanding of state-of-the-art consumer electronic devices. It will also foster the awareness of students in the future challenges and opportunities in the industry.