

## Liverpool John Moores University

Title: Embedded Systems  
Status: Definitive  
Code: **6302ELE** (121440)  
Version Start Date: 01-08-2021

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

Team	Leader
Muhammad Ateeq	Y
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**Academic Level:** FHEQ6  
**Credit Value:** 20  
**Total Delivered Hours:** 46  
**Total Learning Hours:** 200  
**Private Study:** 154

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	22
Practical	22

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Exam	70	2
Report	Report	Report	30	

### Aims

*To provide both the theoretical and practical skills in the design and development of advanced embedded systems.*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Design and implement complex integrated hardware and software solutions to engineering problems.
- 2 Apply the software development lifecycle to embedded projects.
- 3 Compare and contrast microprocessor hardware as to its suitability to specific engineering applications.
- 4 Evaluate the use of real-time operating systems.
- 5 Analyse the security implications of network connectivity in embedded applications.

### **Learning Outcomes of Assessments**

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

Exam	3	4	5
Embedded Systems Project	1	2	3

### **Outline Syllabus**

*Design Application: Circuit Schematics, Flow charts, Pseudo code. Hardware design.*

*High level language constructs: variables, conditional statements, loops, string handling, input-output, classes, inheritance, functions, Arrays.*  
*Embedded Systems Modelling Tools*

*Development Lifecycle: Design, Development, Testing, Maintenance.*

*Microprocessor Hardware: Power, price, energy, capability.*  
*RTOS: Cost, Security, Driver support, development time.*  
*Security: Hacking threats, Maintenance/Updates, SCADA.*

### **Learning Activities**

Lecture, demonstration and practical activities applying topics discussed.

### **Notes**

This module will provide students with the capability to design and develop an embedded solution to an engineering problem.