

Liverpool John Moores University

Title: Embedded Systems
Status: Definitive
Code: **7009ELE** (120413)
Version Start Date: 01-08-2021

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

| Team | Leader |
|----------------|--------|
| Princy Johnson | Y |
| Ronan McMahon | |

Academic Level: FHEQ7 **Credit Value:** 20 **Total Delivered Hours:** 74
Total Learning Hours: 200 **Private Study:** 126

Delivery Options

Course typically offered: Semester 2

| Component | Contact Hours |
|-----------|---------------|
| Lecture | 24 |
| Practical | 24 |
| Tutorial | 24 |

Grading Basis: 50 %

Assessment Details

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|-----------|-------------------|---------------------|---------------|---------------|
| Exam | Exam | Exam | 70 | 2 |
| Portfolio | Practical | Lab demo and 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 the suitability to specific engineering applications of microprocessor hardware
- 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:

| | | | |
|----------------------------|---|---|---|
| Examination | 3 | 4 | 5 |
| Laboratory demo and report | 1 | 2 | |

Outline Syllabus

Design Application: Circuit Schematics, Flow charts, Pseudo code. Hardware design. High level language constructs: variables, conditional statements, loops, string handling, input-output, data structures, classes, inheritance, file handling, functions, Arrays, conditional statements, loops, string handling, input-output, data structures, functions.

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

Lectures, Tutorials, Practical activities

Notes

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