

## Liverpool John Moores University

Title: Embedded Systems  
Status: Definitive  
Code: **5077ENG** (116948)  
Version Start Date: 01-08-2012

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

Team	Leader
Princy Johnson	Y

**Academic Level:** FHEQ5  
**Credit Value:** 20.00  
**Total Delivered Hours:** 72.00  
**Total Learning Hours:** 200  
**Private Study:** 128

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	22.000
Practical	24.000
Seminar	24.000

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam		60.0	2.00
Essay	Essay 1		20.0	
Essay	Essay 2		20.0	

### Aims

*To develop knowledge and understanding of embedded systems.*

### Learning Outcomes

After completing the module the student should be able to:

- LO1 Design simple integrated hardware and software solutions to engineering problems
- LO2 Develop suitable C programme within the limitations of a selected Embedded platform
- LO3 Test and Analyse a simple Embedded system solution
- LO4 Discuss the elements of Real-Time Operating Systems in the context of Embedded systems
- LO5 Compare/contrast the basic attributes of hardware platforms for particular engineering problems

### Learning Outcomes of Assessments

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

Exam	LO 2	LO 4	LO 5	
Essay	LO 1	LO 2	LO 3	
Essay	LO 1	LO 2	LO 3	LO 5

### Outline Syllabus

*Embedded Systems Introduction: compare with microprocessors and other computing systems. Typical Applications*  
*High level language constructs: variables, conditional statements, loops, string handling, input-output, data structures, classes, inheritance, file handling, functions, operating systems interfacing.*  
*Real time systems: Definition. Signals from the real world. Response times. The need for an RTOS. Characteristics of real-time operating systems*  
*Hardware Platforms: Characteristics of different platforms. CISC, RISC,*

### Learning Activities

Series of Lectures, tutorials, seminars and practical classes

### References

<b>Course Material</b>	Book
<b>Author</b>	Stallings, W
<b>Publishing Year</b>	2005
<b>Title</b>	Operating Systems
<b>Subtitle</b>	
<b>Edition</b>	5th
<b>Publisher</b>	Prentice Hall

<b>ISBN</b>	
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<b>Course Material</b>	Book
<b>Author</b>	Wilmshurst, T
<b>Publishing Year</b>	2007
<b>Title</b>	Designing Embedded Systems with PIC Microcontrollers – Principles and Applications
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Newnes
<b>ISBN</b>	

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### Notes

The module develops Embedded Systems as a separate thread from microprocessors. The focus is on developing integrated solutions in a limited environment. This involves limitations on the available resources – memory, processor capacity & speed, I/O etc.