

Liverpool John Moores University

Title: REAL-TIME SYSTEMS
Status: Definitive
Code: **6000ESE** (120633)
Version Start Date: 01-08-2016

Owning School/Faculty: Computer Science
Teaching School/Faculty: Computer Science

| Team | Leader |
|------------------------|--------|
| Somasundaram Ravindran | Y |

Academic Level: FHEQ6
Credit Value: 20
Total Delivered Hours: 74
Total Learning Hours: 200
Private Study: 126

Delivery Options

Course typically offered: Standard Year Long

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

Grading Basis: 40 %

Assessment Details

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|----------|-------------------|--|---------------|---------------|
| Report | AS1 | Apply the Requirements and Architecture Models to perform the analysis and design of a real-time system. | 20 | |
| Report | AS2 | Perform the analysis and design of a real-time system using the UML. | 40 | |
| Exam | AS3 | Examination. | 40 | 2 |

Aims

To provide an in-depth study various modelling methods for real-time software

systems.

To develop knowledge of the selection and use of appropriate modelling methods for real-time software systems development.

To develop practical experience in the use of modelling methods and associated CASE tools for the analysis and design of real-time software systems.

Learning Outcomes

After completing the module the student should be able to:

- 1 Critically evaluate the operational characteristics of real-time systems and their development techniques.
- 2 Critically review and integrate the theoretical aspects of real-time systems.
- 3 Apply Data Flow modelling methods to the analysis, specification and design of real-time systems/applications.
- 4 Apply Object Oriented modelling methods to the analysis, specification and design of real-time systems/applications.
- 5 Use software tools to facilitate the application of the modelling methods.

Learning Outcomes of Assessments

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

| | | |
|---------------------------|---|---|
| Data Flow modelling | 3 | |
| Object Oriented modelling | 4 | 5 |
| Examination | 1 | 2 |

Outline Syllabus

Real-Time Systems - Operations: characteristics, timing issues, mechanisms, structures, and applications. Safety critical systems: concepts, features, criticality, requirements, and controls. Operation modelling: concepts, methods, analysis, and applications.

Requirements Analysis for Real-Time Software Systems - Structured requirements analysis: concepts, principles, timing requirements, processes, methods, and applications. Object oriented requirements analysis: principles, processes, identification of objects and classes, analysis of external system behaviours, modelling of object interactions, defining class structures, and analysis and modelling of object behaviours.

Real-Time Software Systems Design – Structured system design: concepts, principles, safety issues, fault tolerance techniques, design methods, and applications. Object oriented system design: design principles, architecture design, mechanistic design, detailed design, design strategies, design patterns, and activity modelling.

CASE Tools: Effectiveness of CASE tools, and use of CASE tools for the analysis and design of real-time software systems.

Learning Activities

Include attending lectures, tutorials and labs, as well as reading books and handouts.

Notes

This module covers analysis, specification and design issues related to real-time software systems/applications.