COURSE DETAILS
Course Code: B31DG
Full Course Title: Embedded Software
SCQF Level: 11
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: No  Postgraduate Taught: Yes  Postgraduate Research: No

COURSE AIMS
• Critically understand the design issues associated with embedded software
• Review software issues when writing code for embedded systems
• Understand the need for an RTOS (real-time operating systems) in embedded software design
• Review design methods for real-time systems
• Review structure of a RTOS
• Present various underlying mechanisms employed by RTOS and their use by programmers

LEARNING OUTCOMES – SUBJECT MASTERY
• Understand the structure of embedded software
• Be aware of C programming issues when coding for embedded systems
• Understand the role of an RTOS in complex real-time software
• Understand the structure of a modern embedded RTOS
• Understand synchronisation and communication in embedded systems
• Understand approaches to fault tolerant and reliable embedded software design
• Understand concurrency and use of threads
• Understand real time scheduling issues.

LEARNING OUTCOMES – PERSONAL ABILITIES
• Develop group working skills

SYLLABUS
• Overview of the embedded software subject area
• Discuss techniques used when writing code for embedded systems I/O, interrupts, etc
• Review design issues for complex real-time software
• Introduce dataflow methodologies
• Introduce the concept of an RTOS that can implement a dataflow system
B31DG Embedded Software

- Review RTOS structures relating to practical commercial RTOSs.
- Message based synchronisation and communication
- Shared variable synchronisation and communication
- Reliability and Fault Tolerance
- Concurrent Programming and threads
- Scheduling and real-time facilities
- Case Studies

COURSE RELATIONSHIPS
N/A

LOCATION AND ASSESSMENT METHODS

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