B31DG Embedded Software

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
Additional Information:

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
- 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

LOCATION AND ASSESSMENT METHODS

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