Aston University REG/03/53(2)

Quality and Standards Committee

Module Specification

School and Subject Group		School of Engineering and Applied Science, Electronic Engineering	
Module Code		EE404A	
Module Title		Software Engineering	
Module Type		Taught	
Date of introduction of new module		2001	
Level		7	Credit Value 10
Programme(s) in which module is available		MSc in Telecommunications Technology MSc in Telecommunications Technology (Distance Learning) MSc in Data Communications Networks MSc in Data Communications Networks (Distance Learning)	
Involvement of Other Schools		None	
Resource Split			
Name of Module Co-ordinator		G. Hobley	
Name of Module Advisor		Dr. John A.R. Williams	
Related Modules	Pre-requisites	None	
	Co-requisites	None	
	Prohibited Combinations	None	
Minimum and Maximum Intake Sizes		None – None	

Aims of the Module

To examine the issues involved in developing and maintaining software for real-time embedded applications.

Summary of Content

Types of software, characteristics of real-time systems, software life cycles, requirements capture and modelling, entity-relationship diagrams/object models, state-transition charts, data-flow diagrams, real-time structured analysis : use on small and large applications (call logger and photonics multiplexer). Object-oriented modelling - OMT, UML. Object-oriented methods vs. structured methods.

Provision for concurrency, input/output by interrupts and polling, real-time operating systems : task management, synchronisation, task scheduling, timing, mutual exclusion, semaphores. Design considerations for creation of tasks. Tasking architectures for structured and object-oriented software.

Real-time algorithms and data structures : space-time trade-off & consequences for embedded systems, stack, queue, linked list, sequential search, binary search, inversion, hash tables, trees.

Prerequisites: Some prior high-level programming experience is useful but not essential.

Summary of Methods and Frequency of Teaching	**Lectures** 18 hours.

Summary of Methods of Assessment

Assessment Type	*Status*	*%*	*Requirements*	*Due*
Formal Examination	Compulsory	100.0	Final Examination. 1.5hr formal examination	24 Mar 2010

Module Outcomes - what the student should gain from successful completion of the module:	Learning and Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated	
	Learning and Teaching Methods	Assessment Methods
A. Knowledge and Understanding		
how to structure software according to the object-oriented paradigms the underlying functions of Stored Programme Control for digital telephone exchanges, how to construct real-time software for telecommunications systems, how to structure software according to the object oriented paradigms	Lectures	Formal Examination
B. Intellectual Skills		
C. Professional Skills		
apply their knowledge of the principles underlying modern data networks apply the requisite specialist knowledge and skills to develop and manage current systems and to adapt to the changing face of communications technology	Lectures	Formal Examination

D. Transferable Skills		
Please provide either or both of:		
(i) Introductory Learning Resources		
(ii) Core Texts	1. *Main Book:*"Software engineering - a practitioner's approach", Roger Pressman, McGraw-Hill, 2000 (5th edition) 2. *Supplementary:*"Structured development for real-time systems", P.T. Ward and S.J. Mellor, Yourdon Press, 1985 3. "Object-oriented modelling and design", James Rumbaugh et al., Prentice Hall, 1991	
Reading Lists	Attached	
Specification completed by:	Dr. John A.R. Williams	
Date	22-Apr-2009	
Date module approved by Teaching Committee(s)		
Date module approved by School Board(s)		