

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Realtime Systems
Course number	ITSE4307
Faculty	
Department	
Course type	Major Needs
Course level	4
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1	- Develop students ability to understand the characteristics of real time embedded systems and the concepts of engineering control systems
2	- Train students on applying the theories and principles relevant to the design and development of real time embedded systems
3	- Provide students with the knowledge necessary to assess the relevance of software tools, notations and methods of real time embedded systems

Intended Learning Outcomes

Knowledge and Understanding	* a1- Identify the important characteristics of real-time systems * a2 - Outline a range of structured and/or formal specification and design techniques as applied to real time systems * a3 - Define the necessary and desirable facilities provided by real time operating systems and languages
Intellectual Skills	* b1 - Determine real-time systems requirements * b2 - Design real-time systems
Professional Skills	* c1 - Implement a real-time system * c2 - Test real-time systems
General Skill	* d1- Work in a team * d2- Share ideas

Course Contents

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| 1 - Interfacing techniques used in medium and large-scale real time systems |
| 2 - Polled and Interrupt driven Device Drivers |
| 3 - Control Theory applied to medium and large-scale real time systems |
| 4 - Real Time Requirements and Specification techniques |
| 5 - Real Time Design Methods |
| 6 - Real Time Operating Systems |
| 7 - Real Time Languages |
| 8 - Testing Methods |
| 9 - Recent Advances in Real Time Systems Development |
| 10 - System case studies |

Teaching and Learning Methods

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| 1 - Lectures |
| 2 - Case Studies |

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
Mid-term 1	6th week	20%
Mid-term 2	12th week	20%
Projects	During 16 weeks	10%
Final Exam	16th week	50%

Books and References

Essential books	Real-Time Systems Development, Rob Williams (2006), Elsevier Ltd. Real-time systems introduction
Recommended books	Alan Burns and Andy Wellings. Real-Time Systems and Programming Languages Addison-Wesley, 2001 (3rd ed.)

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
Interfacing techniques used in medium and large-scale real time systems	1	a1			
Polled and Interrupt driven Device Drivers	2	a3			
Control Theory applied to medium and large-scale real time systems	3-4	a2	b1	c2	
Real Time Requirements and Specification techniques	5	a1-a2	b1-b2		
Real Time Design Methods	6	a2	b1-b2	c1	
Real Time Operating Systems	7	a1,a3			
Real Time Languages	8-9	a3		c1	
Testing Methods	10-11			c2	
Recent Advances in Real Time Systems Development	12-13		b1-b2	c1	d1-d2
System case studies	14-15			c1	d1-d2