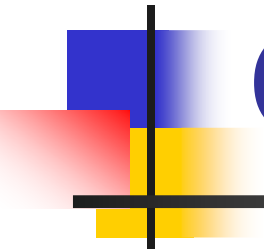

Embedded Real-Time Operating System Design

RTOS.X: Theory, Analysis, Performance and Portability

Syllabus (1)

	Topics	Text	Milestones
1	Course Description and Objectives, Prerequisite Skills	Preface	Background Material
2	RTOS Overview	Section 1.2	Foundation Concepts
3	Boot Process & Development Environment	Section 3.3	Boot Mode and Development Environment
4	Processor Architecture (1)	Section 3.3	CPU Registers and Addressing Models
5	Processor Architecture (2)	Section 3.3	Addressing Modes and Debugging
6	Critical Hardware Resources	Section 3.3	Interrupt Processing

Syllabus (2)

	Topics	Text	Milestones
7	RTOS Fundamentals	Chapter 1	Multitasking, Timeslice and Semaphores
8	RTOS API Definition (1)	Chapter 2	RTOS.h header file
9	RTOS API Definition (2)	Chapter 2	RTOS.h header file
10	Real-Time Embedded Systems	Section 1.1	Sample RTOS Use Cases
11	RTOS Requirements	Section 2.1	RTOS Temporal Requirements
12	RTOS Internals	Section 2.1.1	RTOS.c Design / Architecture

Syllabus (3)

	Topics	Text	Milestones
13	Task Control Block & Task Context	Section 2.1	Primary RTOS Data Structures
14	Context Switching (1)	Section 3.4	Fundamental Operations and Sequences for Context Switching
15	Context Switching (2)	Section 3.4	Detailed Mechanics of Performing a Context Switch between Tasks
16	Counting ("Dijkstra") Semaphores	Section 2.5	Full Implementation of Counting Semaphores
17	Binary Semaphores & Software Events	Section 2.6 Section 2.7	Full Implementation of Software Events and Binary Semaphores
18	Condition Variables & Message Passing	Section 2.8 Section 2.9	Full Implementation of Condition Variables and Message Passing
19	Process Management	Section 2.2 Section 2.3	Full Implementation of Process Management and Ancillary Functions

Syllabus (4)

	Topics	Text	Milestones
20	Error Handling	Section 2.4	Handling Errors and Detecting Deadlock
21	Hardware Independence	Section 3.1	How and Why an RTOS should be Portable
22	Validation	Chapter 4	Test Suite to Validate that the RTOS is correct
23	Performance Assessment	Chapter 5	RTOS Temporal Performance Assessment
24	Priority Inheritance	Section 6.2	Priority Ceiling Protocol Theory and Application
25	Earliest Deadline First Scheduling	Section 6.3	EDF Scheduling Theory and Application
26	Multiprocessor Systems	Section 6.4	How the RTOS would operate on multiprocessor platform

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GPS Engineering Consulting, LLC

18 Royal Birkdale Court

Penfield, NY 14526