FIRST SEMESTER 2015-16

Course Handout (Part II)

Date: 02/08/2016

In addition of Part 1 (General Handout for all courses appended to the Time Table), this portion gives further specific details regarding the course.

Course Number : BITS G553

Course Title : Real-Time Systems

Instructor-in-charge : G S SESHA CHALAPATHI

1. Scope and Objectives:

Real-time systems are those systems that require a deterministic upper time-bound for the execution of a job. With the proliferation of the embedded system, which is the heart of items ranging from common every day appliances to life-critical systems, a great deal of work has gone into the characterization and design issues of Real-time systems. The course focuses on the basics of Hardware design, advanced concepts of software design and validation techniques for these systems. Specifically we discuss the Operating system, Scheduling, Software techniques, Run-time environment, failure management algorithms, Reliability and Fault-tolerance of real-time systems etc. It would also include some case studies and introduction to some real time hardware like TI's C2000 and some experiments on this platform like task switching using TI-RTOS, task synchronization, etc

2. Text Book:

1. Liu Jane W. S.: Real-Time Systems, Pearson Education, India 2003.

3. Reference Books:

1. Krishna C.M. & Shin K.G.: Real-Time Systems, McGraw-Hill 1997
2. Laplante Phillip A.: Real-Time System Design and Analysis. Third Edition PHI 2005.
3. Qing Li, Caroline Yao. Real-Time concepts for Embedded systems CMP Books
4. Raj Kamal, Embedded Systems Architecture, programming and Design, Tata McGraw Hill
5. IEEE or related journal papers on some of the course topics.

4. Course Plan:

Lecture No	Topic	Reference
1-4	Introduction and Basic Real-Time Concepts	Ch 1-4 T1

5-14	Real-Time Scheduling algorithms	Ch 5-7 T1
15-19	Resource Access Protocols	Ch 8 T1
20-21	Hardware Issues	Ch 2 R2
22-23	Software Issues	Ch 5 R2
24-26	Real-Time Operating Systems	Ch 12 T1 , Ch 3 R2, Ch 9 R4
27-28	Intertask Communication and Synchronization	Ch 3 R2
29-31	Memory Management and File systems	Ch 3 R2/Class Notes
32-34	Real-Time specification and Design Technique	Ch 4 R2
35-37	Fault tolerance and Reliability	Ch 8 R2
38-40	Case studies/ hardware demonstartion	Class Notes
Total Lecture Hours		**40**

5. Evaluation Scheme

EC No.	Evaluation component	Duration	Weightage	Date, time and venue	Nature of component
1	Mid Semester Test	90 min	25 %	8/10 8:00 - 9:30 AM	Closed Book
2	Assignments	To be announced	40%	To be announced	--
3	Comprehensive exam	3 hours	35 %	13/12 AN	Open Book

6. **Chamber Consultation Hour :** To be announced in the class
7. **Make-up Policy:** Make Up will be given only in genuine case and with prior permission
   Notices regarding this course will be displayed on EEE and CSIS notice board only.

Instructor-in-Charge

BITS G553