School of Technology
Assam Don Bosco University

COURSE PLAN AND EVALUATION SCHEDULE (Spring Semester 2016)

BTCSRE8025: REAL TIME AND EMBEDDED SYSTEMS

(8th SEM – CSE – 4 Credits- 60 hours)

Scope and Objective: *The main purpose of the course is to develop and gain an understanding of the design issues in an embedded system and technologies needed to support such systems.*

Mode of assessment

Assessment Components	%	Expected date	Mode of assessment	Contact details
Assignment	10	Release(11th Jan. 2016) Due(1st Feb. 2016)	Design/Labwork/ Presentation	Day-V, 11:55 A.M to 1:45 PM at Faculty Chamber. (#220)
Class Test (Best 1of 2)	20			Faculty name: Mr. Sarat Kumar Chettri
Class Test1		15th February,2016	Written	
Class Test2		6th April,2016	Written	Email: sarat.chettri@dbuniversity.ac.in
Non-formal	5	End of all cycles	Class room interactions and participation in class activities	
Attendance	5	End of all cycles	As per Attendance records	
End term examination	60	16th May,2016	Written (entire syllabus)	
Total	**100**			

Learning Objectives:

1. *Understand the basic concept of embedded system and its design principles.*
2. *Find out the various challenges in developing a real time embedded system and how to overcome them.*
3. *Understand the ARM and SHARC processors with its associated operations.*
4. *Develop ARM codes to perform various tasks in embedded systems.*
5. *Understand the concept of Distributed Embedded system architectures and BUS.*
6. *Understand the various designs of systems with design example.*
7. *Develop the knowledge of various scheduling policies in real time embedded systems.*

Provisional Schedule for Learning and Training

Cycle	Lectures (Major topics)	Tutorial	Learning Objective (LO) and Assessments
1	Introduction, Complex Systems And Microprocessors, The Embedded System Design Process.	4 per cycle(1hr)	LO: 1
2	Formalisms For System Design, Design Example: Model Train Controller	4 per cycle(1hr)	LO: 1,2
3	Embedded Processor and Computing Platform: ARM Processor, SHARC Processor.	4 per cycle(1hr)	LO: 3,4
4	CPU Bus, Memory Devices, I/O Devices, Component Interfacing,	4 per cycle(1hr)	LO: 4
5	Designing with microprocessors, Development and Debugging, Design Example: Alarm Clock.	4 per cycle(1hr)	LO: 4, Class Test1
6	Networks: Distributed Embedded Architectures, Networks For Embedded Systems.	4 per cycle(1hr)	LO: 5
7	Network-based design, Elevator Controller design example	4 per cycle(1hr)	LO: 5,6
8	Real Time Characteristics: Clock Driven Approach, Weighted Round Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Effective Release Times And Deadlines.	4 per cycle(1hr)	LO: 7

9	Optimality Of The EDF And LST Algorithms, Challenges In Validating Timing Constraints In Priority-Driven Systems, Off-Line Versus On-Line Scheduling.	4 per cycle(1hr)	LO: 7
10	System Design Techniques: Design Methodologies, Requirement and Specification, Quality Assurance	4 per cycle(1hr)	LO: 6
11	Design Example: Telephone PBX, Ink Jet Printer	4 per cycle(1hr)	LO: 6 , Class Test2
12	Design Example: Personal Digital Assistants, Set-top Boxes.	4 per cycle(1hr)	LO: 6
13	Revision1	Revision1	
14	Revision1	Revision1	End term examination

Suggested Readings:

1. Wayne Wolf, Computers as Components: Principles of Embedded Computing System Design, Morgan Kauffman publishers, 2001.
2. Alan C. Shaw, Real-Time Systems and Software, John Wiley & Sons Inc.
3. As mentioned in the Handbook for Spring Semester 2016.
4. Suggested web links: To be provided as and when required for a particular module/topic.