Kadi Sarva Vishwavidyalaya

Faculty of Engineering and Technology

First Year Master of Engineering (Computer Engineering)

In Effect from Academic Year 2017-18

Subject Code: MECE106-N-C	Subject Title: REAL TIME OPERATING SYSTEM

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
04	00	02	06	05	03	70	30	20	30	150

LEARNING OBJECTIVES:

The objective of this course is to introduce students to the following concepts of

- Describe the Introductory and Fundamental issues of Real time systems.
- Understand the core theories underlying the development of practical real time and embedded systems
- Discuss the Important features of commercial real time operating systems.
- Explain the network for real time system.
- To study different issue with Real time Database.

Pre-requisites for RTOS.

- Student must have good knowledge of Operating System.
- Student must have sound knowledge of Unix Commands.
- Must have Idea of Distributed Systems.

OUTLINE OF THE COURSE:

Unit No	Topics	Hours
1	Introduction:	07
2	Uniprocessor Real-Time System	12
3	Multiprocessor Real-Time System:	08
4	Distributed Real-Time System:	12
5	Real time Communication	08
6	Real time OS	08
7	Other issues related to RTS.	09

Total hours (Theory): 64
Total hours (Practical): 32
Total hours: 96

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DETAILED SYLLABUS:

Sr. No	Topic	Lecture Hours	Weightage (%)
1	**Introduction:** • Real-time systems • Properties • Misconceptions • Real-Time tasks • Scheduling results	07	10
2	**Uniprocessor Real-Time System:** • Real time Task Scheduling • Handling resource Sharing and dependencies • Resource Sharing Protocols	12	19
3	**Multiprocessor Real-Time System:** • Task Scheduling • Fault-tolerance • Resource Reclaiming	08	13
4	**Distributed Real-Time System:** • Global scheduling-transfer • Information • Location policies	12	18
5	**Real-time Communication** • Real-time channel • Packet scheduling • Real-time MAC Protocols	08	13
6	**Real-time OS:** • RT-Linux • Case studies of RTOS • Real-time CORBA	08	13
7	**Other Issues:** • Architectural support • Language support • Real-time Database • **Study NAGI-Operating System**	09	14
	Total	64	100

INSTRUCTIONAL METHOD AND PEDAGOGY (Continuous Internal Assessment (CIA) Scheme)

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.

- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

STUDENTS LEARNING OUTCOMES:

On successful completion of the course, the student will:

1. Understand how the Real time systems require most of the knowledge acquired during their study.
2. Develop a firm and enlightened grasp of concepts of different issues related with network and database.
3. Apply the ideas, the techniques, and the knowledge acquired for the purpose of Research on area of real time system.
4. Working skills in theory and application of Real time Systems.

REFERENCE BOOKS:

1. Real time system by jane Liu
2. Linux for Embedded and Real-Time applications Doug Abbott, Newnes
3. Real Time Systems theory and practice by Rajib mall.

Articles:

1. http://nptel.iitm.ac.in/courses.php
2. http://mrtc.mdh.se/
3. www.cs.wustl.edu/~schmidt/corba-research-realtime.html
4. www.clei.cl/cleiej/papers/v12i2p4.pdf

LIST OF PRACTICALS:

Sr. No	Name of Experiment
1	Write a C program Implement Table driven Scheduling Algorithm.
2	Write a C program Implement Event driven Scheduling Algorithm.
3	Write a C program Implement Earliest Deadline First Algorithm.
4	Write a C program Implement Least significant first Algorithm.
5	Write a C program Implement Rate Monotonic Algorithm.
6	Write a C program Implement Deadline Monotonic Algorithm.
7	Write a C program Implement Time Sliced Round Robin Algorithm.
8	Write a C program Implement Priority Inheritance Protocol.
9	Write a C program Implement Priority ceiling Protocol.
10	Write a C program Implement Highest Locker Protocol.
11	Case study for implementation of NAGI-O.S.