GUJARAT TECHNOLOGICAL UNIVERSITY

INSTRUMENTATION AND CONTROL (APPLIED INSTRUMENTATION) (03)
REAL TIME OPERATING SYSTEM
SUBJECT CODE: 2730304
M.E. SEM-III

Type of course: Major Elective - IV

Prerequisite: Microprocessor and microcontroller, computer hardware and software skills.

Rationale: This course provides an overview and fundamentals of various types of Real time operating System.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks		Practical Marks				
L	T	P	C	ESE (E)	PA (M)	PA (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	2	5	70	30	20	10	10	10	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage in %
1.	Introduction	**06**	**15**
2.	Modelling Timing constraints	**03**	**5**
3	Scheduling Real-Time Tasks: Types of Schedulers Table-driven scheduling Cyclic schedulers EDF RMA	**09**	**25**
4	Handling Resource sharing among real-time tasks	**06**	**15**
5	Scheduling Real-Time Tasks in Multiprocessor and Distributed systems	**03**	**10**
6	Commercial Real-time operating systems: General concepts Unix and Windows as RTOS	**06**	**15**
7	Survey of commercial RTOS	**05**	**6**
8	Real-Time Communication	**04**	**5**
9	Real-Time Databases	**03**	**4**

Reference Books:

1. Rajib Mall, "Real-Time Systems: Theory and Practice," Pearson, 2008.
2. Doug Abbott, “Linux for Embedded andReal-Time Applications”,ThirdEdition,Elsevier, 2013
3. Doug Abbott , “Linux for Embedded andReal-Time Applications”,ThirdEdition,Newnes, 2003
4. Ivan CibrarioBertolotti and Gabriele Manduchi, “Real Time Embedded Systems”, CRC press,2012
5. Jane W. Liu, "Real-Time Systems" Pearson Education, 2001.
6. Krishna and Shin, "Real-TIme Systems," Tata McGraw Hill. 1999.

Course Outcome:

After learning the course the students should be able to

1. Understand the structure of various types of Scheduling Real-Time Tasks
2. Understand the Real-Time Communication
3. Understand the dynamic behavior of various Real-Time Databases.

List of Experiments:

Student has to prepare computer programs and algorithms for variousreal time operating system.

Prepare research paper and submit report of variousreal time operating systems covered in this course.

Open Ended Problem: Solution of the open ended problem(s) in guidance of course instructor is mandatory.

Major Equipment:

Computer Laboratory

List of Open Source Software/learning website:

- Matlab,Scilab
- NPTEL

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.