

MP5291 REAL TIME SYSTEMS

DETAILED SYLLABUS

UNIT I REAL TIME SYSTEM AND SCHEDULING

Introduction– Structure of a Real Time System –Task classes – Performance Measures for Real Time Systems – Estimating Program Run Times – Issues in Real Time Computing – Task Assignment and Scheduling – Classical uniprocessor scheduling algorithms –Fault Tolerant Scheduling.

UNIT II SOFTWARE REQUIREMENTS ENGINEERING

Requirements engineering process – types of requirements – requirements specification for real time systems – Formal methods in software specification – structured Analysis and Design – object oriented analysis and design and unified modelling language – organizing the requirements document – organizing and writing documents – requirements validation and revision.

UNIT III INTERTASK COMMUNICATION AND MEMORY MANAGEMENT

Buffering data – Time relative Buffering- Ring Buffers – Mailboxes – Queues – Critical regions – Semaphores – other Synchronization mechanisms – deadlock – priority inversion – process stack management – run time ring buffer – maximum stack size – multiple stack arrangement – memory management in task control block - swapping – overlays – Block page management – replacement algorithms – memory locking – working sets – real time garbage collection – contiguous file systems.

UNIT IV REAL TIME DATABASES

Real time Databases – Basic Definition, Real time Vs General Purpose Databases, Main Memory Databases, Transaction priorities, Transaction Aborts, Concurrency control issues, Disk Scheduling Algorithms, Two– phase Approach to improve Predictability – Maintaining Serialization Consistency – Databases for Hard Real Time Systems.

For Questions Papers, Syllabus, Notes and Many More

UNIT V EVALUATION TECHNIQUES AND CLOCK SYNCHRONIZATION

Reliability Evaluation Techniques – Obtaining parameter values, Reliability models for Hardware Redundancy–Software error models. Clock Synchronization–Clock, A Nonfault– Tolerant Synchronization Algorithm – Impact of faults – Fault Tolerant Synchronization in Hardware – Fault Tolerant Synchronization in software.

OBJECTIVES:

To learn real time operating system concepts, the associated issues & Techniques.

To understand design and synchronization problems in Real Time System.

To explore the concepts of real time databases.

To understand the evaluation techniques present in Real Time System.

REFERENCES:

1. C.M. Krishna, Kang G. Shin, —Real-Time SystemsII, McGraw-Hill International Editions, 1997
2. Philip.A.Laplante, —Real Time System Design and AnalysisII, Prentice Hall of India, 3rd Edition, 2004
3. Rajib Mall, —Real-time systems: theory and practicell, Pearson Education, 2009
4. R.J.A Buhur, D.L Bailey, —An Introduction to Real-Time SystemsII, Prentice Hall International, 1999
5. Stuart Bennett, —Real Time Computer Control-An IntroductionII, Prentice Hall of India, 1998
6. Allen Burns, Andy Wellings, —Real Time Systems and Programming LanguagesII, Pearson Education, 2003.