Course Objective:
To obtain a broad understanding of the technologies and applications for the domain of real-time operating system.

Teaching and Assessment Scheme:

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<th>Teaching Scheme (Hours per Week)</th>
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Course Content:

1. **Introduction**:
   Introduction to Operating System: Computer Hardware Organization, BIOS and Boot Process, Multi-threading concepts, Processes, Threads, Scheduling.

2. **Basics of real-time concepts**:

3. **Process Management**:
   Concepts, scheduling, IPC, RPC, CPU Scheduling, scheduling criteria, scheduling algorithms Threads: Multi-threading models, threading issues, thread libraries, synchronization Mutex: creating, deleting, prioritizing Mutex, Mutex internals.

4. **Inter-Process Communication**:
   Messages, Buffers, mailboxes, queues, semaphores, deadlock, priority inversion,
   **Pipes Memory Management**:
   Process stack management, run-time buffer size, swapping, overlays, block/page management, replacement algorithms, real-time garbage collection

5. **Case Studies**:
   Case study Linux POSIX system, RTLinux / RTAI, Windows system, Vxworks, utron Kernel Design Issues: structure, process states, data structures, inter-task communication mechanism, Linux Scheduling

Total 45
List of References:


Course Outcomes (COs):

By learning this course students will be able to …
1. Understand the features and structures of practical Operating System implementations.
2. Acquire practical knowledge Real Time Operating Systems used in embedded system.
3. Understand the use of multitasking techniques in Real Time Systems.
4. Compare different scheduling algorithms and the schedulability criteria.
5. Analyze real time systems with regard to keeping time and resource restrictions.