

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

Protected by PDF Anti-Copy Free

(Upgrade to Pro Version to Remove the Watermark)

Lecture-5 By Vivek Dubey

PDF

COMPUTER SCIENCE AND ENGINEERING

CS403PC

COMPUTER SCIENCE AND ENGINEERING (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

CS403PC

BHARAT INSTITUTE OF ENGINEERING AND TECHNOLOGY

Scheme of Operating System

Protected by PDF Anti-Copy Free
(Upgrade to Pro Version to Remove the Watermark)



S. No.	Course Code	Course Title	L	T	P	Credits
3	CS403PC	Operating Systems	3	0	0	3
6	CS406PC	Operating Systems Lab	0	0	3	1.5

UNIT-1: *Operating System - Introduction*



- **Structures –**
 - Simple Batch, Multi-programmed, Time-shared,
- **Systems –**
 - Personal Computer, Parallel, Distributed Systems, Real-Time Systems
- **System components**
- **Operating System Services**
- **System Calls**

Types of Operating System

Protected by PDF Anti-Copy Free
(Upgrade to Pro Version to Remove the Watermark)

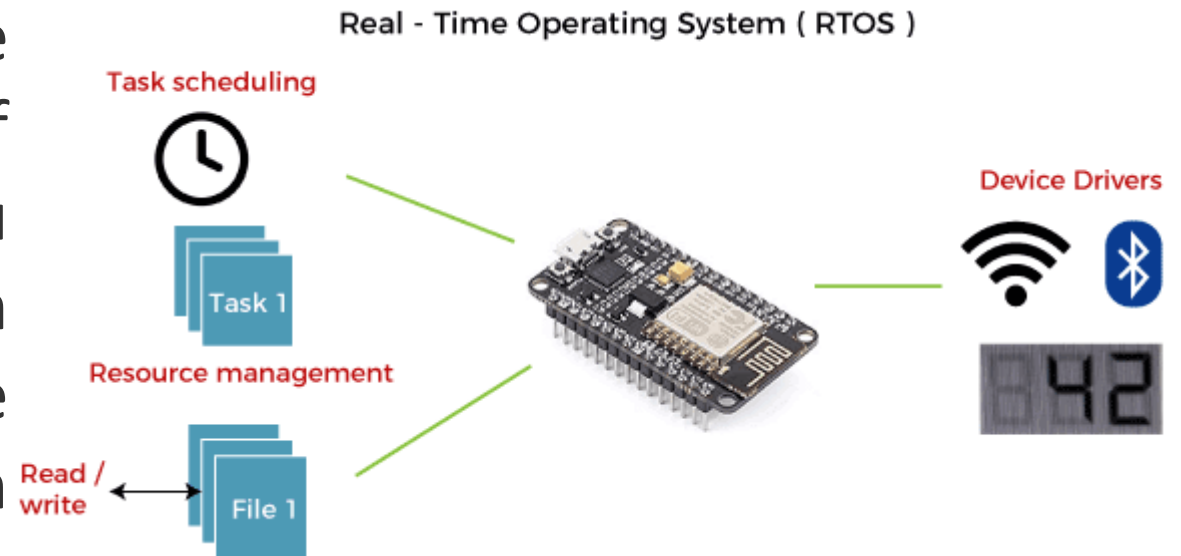


Real Time Operating System

Protected by PDF Anti-Copy Free
(Upgrade to Pro Version to Remove the Watermark)



- In Real-Time Systems, each job carries a certain deadline within which the job is supposed to be completed, otherwise, the huge loss will be there, or even if the result is produced, it will be completely useless.
- The Application of a Real-Time system exists in the case of military applications, if you want to drop a missile, then the missile is supposed to be dropped with a certain precision.



Advantages and Disadvantages of RTOS



- **Advantages of Real-time operating system:**
 - Easy to layout, develop and execute real-time applications under the real-time operating system.
 - In a Real-time operating system, the maximum utilization of devices and systems.
- **Disadvantages of Real-time operating system:**
 - Real-time operating systems are very costly to develop.
 - Real-time operating systems are very complex and can consume critical CPU cycles.

Examples of Real-Time Operating Systems



- The operating system of the microwave oven.
- The operating system of the Washing machine.
- The operating system of the aero plane.
- The operating system of digital cameras and many more.

Types of Real Time Operating System



Hard Real-Time System

Protected by PDF Anti-Copy Free
(Upgrade to Pro Version to Remove the Watermark)



- Hard Real-Time System

- A hard real-time system **considers timelines as a deadline**, and it should not be omitted in any circumstances. Hard real-time Systems **do not use any permanent memory**, so their processes must be complete properly in the first time itself.
- Hard Real-Time System **must generate accurate responses to the events** within the specified time. A hard real-time system is a **purely deterministic and time constraint system**.
- For example, users expected the output for the given input in 5 sec then the system should process the input data and give the output exactly by the 5th second. It should not give the output by the 6th second or by the 4th second.

Examples of Hard Real-Time Systems



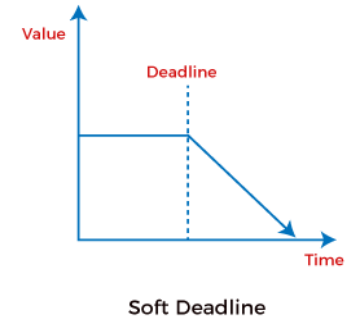
- Flight Control Systems
- Missile Guidance Systems
- Weapons Défense System
- Medical System
- Inkjet printer system
- Railway signalling system
- Air traffic control systems
- Nuclear reactor control systems
- Anti-missile system
- Chemical plant control
- Autopilot System in Plane
- Pacemakers

Soft Real-Time System

Protected by PDF Anti-Copy Free
(Upgrade to Pro Version to Remove the Watermark)

PDF

Lecture-By Vivek Dubey



- A soft real-time system is a system **whose operation is degraded if results are not produced according to the specified timing requirement.**
- In a soft real-time system, **the meeting of deadline is not compulsory for every task, but the process should get processed and give the result.** Even the soft real-time systems cannot miss the deadline for every task or process according to the priority it should meet the deadline or miss the deadline.
- If a **system is missing the deadline every time, the system's performance will be worse and cannot be used by the users.** The best example for the soft real-time system is a personal computer, audio and video systems, etc.

Examples of Soft Real-Time Systems

Protected by PDF Anti-Copy Free
(Upgrade to Pro Version to Remove the Watermark)



- Personal computer
- Audio and video systems
- Set-top boxes
- DVD Players
- Weather Monitoring Systems
- Electronic games
- Multimedia system
- Web browsing
- Online transaction systems
- Telephone switches
- Virtual reality
- Mobile communication