



# OPERATING SYSTEMS

# Introduction

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# OPERATING SYSTEMS

## What do Operating Systems do ?

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## Course Syllabus - Unit 1

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### UNIT 1: Introduction and Process Management

Operating-System Structure & Operations, Kernel Data Structures, Computing Environments, Operating-System Services, Operating System Design and Implementation. Process concept: Process in memory, Process State, Process Control Block, Process Creation and Termination, CPU Scheduling and Scheduling Algorithms, IPC - Shared Memory & Message Passing, Pipes - Named and Ordinary. Case Study: Linux/Windows Scheduling Policies.

# OPERATING SYSTEMS

## Course Outline



Class No.	Chapter Title / Reference Literature	Topics to be covered	% of Portions covered	
			Reference chapter	Cumulative
1	1.1-1.2	What Operating Systems Do, Computer-System Organization?	1	21.4
2	1.3,1.4,1.5	Computer-System Architecture, Operating-System Structure & Operations	1	
3	1.10,1.11	Kernel Data Structures, Computing Environments	1	
4	2.1,2.6	Operating-System Services, Operating System Design and Implementation	2	
5	3.1-3.3	Process concept: Process in memory, Process State, Process Control Block, Process Creation and Termination	3	
6	5.1-5.2	CPU Scheduling: Basic Concepts, Scheduling Criteria	5	
7	5.3	Scheduling Algorithms: First-Come, First-Served Scheduling, Shortest-Job-First Scheduling	5	
8	5.3	Scheduling Algorithms: Shortest-Job-First Scheduling (Pre-emptive), Priority Scheduling	5	
9	5.3	Round-Robin Scheduling, Multi-level Queue, Multi-Level Feedback Queue Scheduling	5	
10	5.5,5.6	Multiple-Processor Scheduling, Real-Time CPU Scheduling	5	
11	5.7	Case Study: Linux/Windows Scheduling Policies	5	
12	3.4,3.6.3	IPC – Shared Memory & Message Passing, Pipes – Named and Ordinary	3,6	

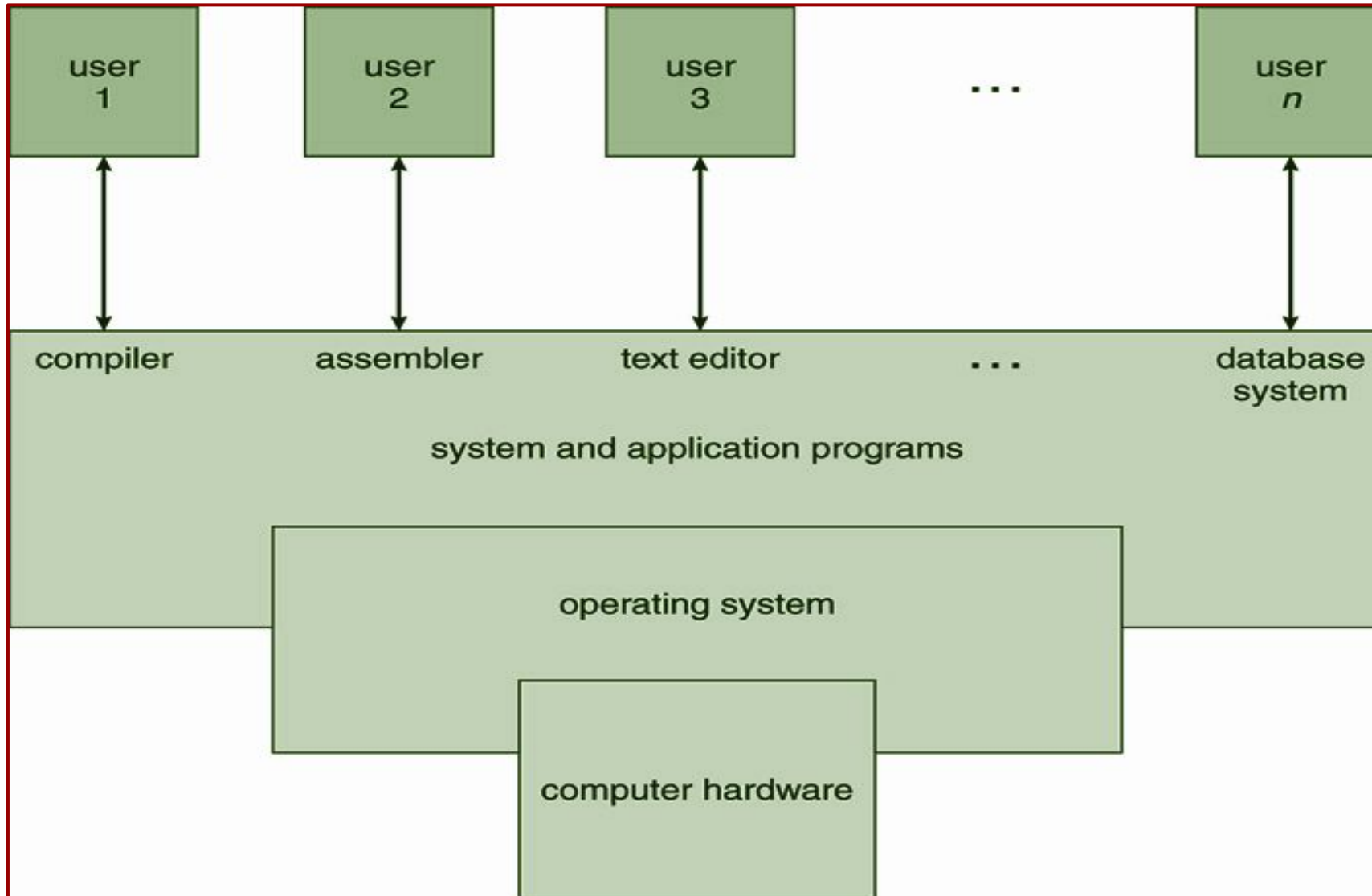
- What do Operating Systems do ?

### What is an Operating System ?

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- A program that acts as an intermediary between user & computer H/W
- Operating system goals:
  - Execute user programs and make solving user problems easier
  - Make the computer system convenient to use
  - Use the computer hardware in an efficient manner

## Operating System Structure



OS\_Interface\_Layer

OS\_Implementation  
Layer

Hardware\_Interface\_Layer

H\_Implementation\_L

## What Operating Systems Do (User View) ?

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- User View
  - Users want convenience, ease of use and good performance
  - Users as such Don't care about resource utilization
  - Shared mainframe/minicomputers need to fairly cater to all users
  - Workstations with dedicated resources frequently share resources of servers
  - Handheld systems are resource poor, optimized for usability and battery life
  - Embedded & mobile systems have little or no user interface



## What Operating Systems Do (System View) ?

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- Systems View
  - OS is a resource allocator, Manages all resources
  - Decides between conflicting requests for efficient & fair use
  - OS is a control program
  - Controls execution to prevent errors and improper Use

## Operating System Definition

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- No universally accepted definition
- “Everything a vendor ships with operating system bundle”
- “Kernel program running at all times on the computer”
- Everything else is either
  - a system program
    - Ships with the operating system
  - an application program

- **What do Operating Systems do ?**



**THANK YOU**

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