

Institute of Computer Science/Information Technology (ICS&IT)  
Faculty of Management Sciences & CS/IT (FMCS)  
The University of Agricultural Peshawar

Program: BS(CS)-5  
Course Name: Operating Systems  
Course Code: CC-502  
Course Hours: 03  
Total Weeks: 16  
Total Hours: 48

Course Objectives

This course intends to cover the preliminaries of a typical Operating System. Students are exposed to the basic concepts of some market-oriented operating systems. After the completion of this course the students will feel familiar with the logic behind working of a typical operating system. They will have understanding of the topics like resource management, Interrupts, memory management and system security. The topics of these themes will help the students to have orientation to some of the market-oriented operating system.

Week-1

- Software Categories
- Operating System Foundation concepts

Week-2

- Types of Operating System
  - Single User Operating System
  - Multi User Operating System

Week-3

- Components of Operating system
- Services/Features of Operating System

Week-4

- Modes of Processing

Week-5

- System Performance
- Nature of jobs

Week-6

- Buffering
- Spooling
- Caching

Week-7

- Process
  - Process States
  - Process Control Block (PCB)
  - Possible Operations on Process.

- 3- State Transition Diagram
- 5- State Transition Diagram.

#### Week-8

- Cooperating Processes
- Inter-Process Communication
- Process Synchronization

#### Week-9

- CPU Scheduling
- Non-Preemptive Scheduling
- Preemptive Scheduling
- Levels of Scheduling
- Scheduling Algorithms
- First Come First Served
- Shortest Job First
- Priority of Scheduling
- Round Robin Scheduling
- Multi-level Scheduling
- Multi-level Feedback Scheduling

#### Week-10

- Dead Lock
  - Conditions of Dead Lock
  - Methods of Dead Lock Removing
    - Prevention
    - Avoidance
    - Detection
    - Recovery

#### Week-11

- Storage Organizations
- Memory Management
- Fixed Partition Memory Management
- Dynamic Partition Memory Management

#### Week-12

- Memory Management Problems
- Internal Fragmentation
- External Fragmentation
- Memory Management Strategies
  - Fetch
  - Placement
  - Replacement
- Swapping
- Shuffling

#### Week-13

- Paging (Basic Concepts)
  - Paging Address Translation By Direct Mapping

- Paging Address Translation By Associative Mapping
- Paging Address Translation with Combined Direct/Associative Mapping

Week-14

- Segmentation (Basic Concepts)
- Segmentation Address Translation By Direct Mapping

Week-15

- Dynamic Address Translation in Paging/Segmentation System
- Interrupts
  - Interrupt Class

Week-16

- File System (Foundation Concepts)
- Comparison of Some Operating Systems

Total Marks: 100

Recommended Books:

1. OPERATING SYSTEMS CONCEPTS, Peterson Silberschatz 6<sup>th</sup> edition (text book)
2. OPERATING SYSTEMS, Dietel
3. OPERATING SYSTEMS, Tenin bomb