**Department of CS & IT**

**Course:** Operating System

Course Code: CS-202

Class: BCS-IV

**Instructor:** Miraj Gul

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| **Weekly schedule for Spring 2024** | | | | |
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| **Week**  **No** | **Activity** | **Course Topic** | **Detail of Topics** | **Reference Material** |
| 1 | Class Work | Introduction | * What is OS? * Functions of OS. * Virtual machines introduction and basic commands of MSDOS. | * Ref. 1 Chapter 1 and Chapter 7 * Ref 2. Chapter 1 and Chapter 14 |
| 2 | Class Work | Generations and Structure of OS | * Generations of OS in detail * Structure of OS. * Case study of Windows and Linux OS | * Ref. 1 Chapter 1 * Ref. 3 Chapter 2 |
| 3 | Class Work | Process Concepts | * Creation and deletion events * PCB * Context switching * Process Tables | * Ref. 2 Chapter 3 * Ref. 3 Chapter 3 |
| 4 | Class Work & Assignment-1 | CPU Scheduling | * Objectives of Scheduling * Types of Scheduling * Selection criteria of preemptive or non-preemptive scheduling | * Ref. 1 Chapter 2 * Ref. 3 Chapter 6 |
| 5 | Class Work  &Test-1 | CPU Scheduling | * Non-Preemptive Scheduling Algorithms * Preemptive Scheduling Algorithms | * Ref. 2 Chapter 9 * Ref. 3 Chapter 6 |

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| 6 | Class Work | Threading issues Kernel and User Modes | * Mode Switching vs Context Switching * Threads Introduction * Similarities and differences between threads and processes. | * Ref.1 Chapter 2 * Ref.2 Chapter 4 |
| 7 | Class Work | Multithreading programming and  Models | * ULTS and KLTS with advantages and drawbacks * Multithreading Models * SMPs and ASMPs | * Ref. 1 Chapter 8 * Ref. 2 Chapter 4 * Ref. 3 Chapter 4 |
| 8 | Class Work | System calls | * Introduction * Types * Steps in making system calls | * Ref.1 Chapter 1 * Ref. 2 Chapter 2 * Ref.3 Chapter 2 |
| 9 | Mid Term  Exam |  | * Paper Setting and marking |  |
| 10 | Class Work | Deadlocks | * Introduction and necessary conditions * Example * Avoidance | * Ref. 1 Chapter 6 * Ref. 2 Chapter 6 |
| 11 | Class Work | Deadlocks | * Deadlock Prevention * Deadlock Recovery | * Ref. 2 Chapter 6 * Ref. 3 Chapter 7 |
| 12 | Class Work  & Assignment-2 | Memory management | * Introduction * Contiguous memory allocation * Swappingand swap space management * Fragmentation and types | * Ref.1 Chapter 3 * Ref.2 Chapter 7 |
| 13 | Class Work | Virtual Memory | * Segmentation and Paging * Demand Paging * Thrashing | * Ref.1 Chapter 3 * Ref.2 Chapter 8 |

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| 14 | Class Work | File Systems | * File concept and File systems * Directory and Directory structure | * Ref. 1. Chapter 4 * Ref. 2. Chapter 12 * Ref. 3. Chapter 12 |
| 15 | Class Work  &Test-2 | File Systems | * Memory mapped files * Directory implementation | * Ref. 1. Chapter 4 * Ref. 3. Chapter 6 * Ref. 2 Chapter 12 |
| 16 | Class Work | IPC | * Synchronization problem and Synchronization Hardware * .Critical Section * Semaphores | * Ref. 2 Chapter 5 * Ref. 3 Chapter 5 |
| 17 | Class Work | Security and Protection | * Security * Protection | * Ref.1 Chapter 9 * Ref.2 Chapter 15 * Ref.3 Chapter 15 |
| 18 | Final Term  Exam |  | * Paper Setting and marking |  |

Reference Book/Material

1. MODERN OPERATING SYSTEMS FOURTH EDITION ANDREW S. TANENBAUM and HERBERT BOS
2. Operating Systems Internals and Design Principles 9th Edition William Stalling
3. Operating Systems Concepts, 9th Edition, Abraham Silberschatz, Peter Baer Galvin and Greg Gagne

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