

# **Government PG College, Ambala Cantt**

**Course File(Session 2023-24)**

**Name of Professor: karmjit kaur**

**Class: Bsc-2/4<sup>th</sup> Semester**

**Subject code and Name:paper-2/ operating SYSTEM**

## **SYLLABUS**

**Maximum Marks: 50**

**External: 40**

**Minimum Pass Marks: 14**

**Internal: 10**

**Time: 3 hours**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

### **UNIT – I**

Operating System: Definition, Characteristics, Components, Functions, Examples; Types of Operating System: Single User/Multi User, Classification of Operating System: Batch, Multiprogrammed, Timesharing, Multiprocessing, Parallel, Distributed, Real Time; System Calls and System Programs: Process Control, File Manipulation, Device Manipulation, Information Maintenance, Communications

### **UNIT –II**

Process Management: Process concept, Process states and Process Control Block; Process Scheduling: Scheduling Queues, Schedulers, Context Switch; Operation on Processes: Process Creation, Process Termination; Cooperating Processes, Introduction to Threads, Inter-process Communication; CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, Priority, Round-Robin, Multilevel Queue, Multilevel Feedback Queue Scheduling

### **UNIT – III**

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery Memory Management: Introduction,

Swapping, Contiguous Allocation: Single-Partition/Multiple Partition Allocation, External/Internal Fragmentation

Paging: Basic Method, Hardware, Implementation of Page table; Segmentation: Basic Method, Hardware, Implementation of Segment Table, Advantages/Disadvantages of Paging/Segmentation

#### UNIT – IV

Virtual Memory: Introduction, Demand Paging, Page Replacement, Page Replacement Algorithms: FIFO, Optimal, LRU, Counting. Thrashing and its cause; File Management: File Concepts, File Attributes, File Operations, File Types, File Access/Allocation Methods, File Protection, File Recovery

DISC SCHEDULING, DISC MNGMT

#### REFERENCE BOOK:

- [1]. Silberschatz, Galvin and Gagne, Operating System Principles, 7th Ed. Addison Wesley.
- [2]. Gary Nutt, Operating Systems, 3rd Ed. Pearson Education, India.
- [3]. Tanenbaum, Modern Operating Systems, PHI.
- [4]. W. Stalling, Operating Systems, Macmillan.
- [5]. H. M. Dietel, Operating Systems, Addison Wesley Longman.
- [6]. Maurice J. Bach, The design of Unix Operating system, Pearson Education, India.
- [7]. Sumitabha Das, Unix Concepts & Applications: includes SCO UNIX & Linux, Tata McGraw Hill.

## **COURSE OBJECTIVES**

The course objectives outlined are as follows:

- Students will learn how Operating System is Important for Computer System. [L] [SEP]
- To make aware of different types of Operating System and their services. [L] [SEP]
- To learn different process scheduling algorithms and synchronization techniques to achieve better [L] [SEP] performance of a computer system. [L] [SEP]
- To know virtual memory concepts. [L] [SEP]
- To learn secondary memory management. [L] [SEP]

## **COURSE OUTCOMES**

After the successful completion of the course, students will be able to:

- understand basic concepts and types of operating system Understand the Process management.
- Do the various problems related to CPU scheduling.
- Befamiliar with concent ofdeadlock and its various recovery techniques
- Be familiar with concept of memory management which consist the concept of swapping, segmentation, demand paging, virtual memory etc.
- Solve the various page replacement problems.
- Be familiar with file organization

## Lesson Plan

Week No	Scheduled Dates	Topics to be covered
1	1-6 January	Operating System: Definition, Characteristics, Components, Functions, Examples; Types of Operating System: Single User/Multi User, Classification of Operating System: Batch, Multiprogrammed, Timesharing, Multiprocessing, Parallel, Distributed, Real Time;
2	8-13 January	System Calls and System Programs: Process Control, File Manipulation, Device Manipulation, Information Maintenance, Communications
3	15-20 January	Process Management: Process concept, Process states and Process Control Block;;
4	22-27 January	Process Scheduling: Scheduling Queues, Schedulers, Context Switch;
5	29-3 February	Operation on Processes: Process Creation, Process Termination; Cooperating Processes, Introduction to Threads, Inter-process Communication
6	5-10 February	CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, Priority, Round-Robin, Multilevel Queue, Multilevel Feedback Queue Scheduling,
7	12-17 February	Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks,
8	19-24 February	Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery Memory Management: Introduction,
9	26-2 March	Swapping, Contiguous Allocation: Single-Partition/Multiple Partition Allocation, External/Internal Fragmentation
10	4-9 March	Paging: Basic Method, Hardware, Implementation of Page table;
11	11-16 March	Segmentation: Basic Method, Hardware, Implementation of Segment Table, Advantages/Disadvantages of Paging/Segmentation
12	18-23 March	Virtual Memory: Introduction, Demand Paging, Page Replacement,

<b>13</b>	<b>1-6 April</b>	Page Replacement Algorithms: FIFO, Optimal, LRU, Counting
<b>14</b>	<b>8-13 April</b>	File Management: File Concepts, File Attributes, File Operations, File Types, File Access/Allocation Methods, File Protection, File Recovery
<b>15</b>	<b>15-20 April</b>	Disc management, Final Test, Assignments and REVISION of Contents
<b>16</b>	<b>22-27 April</b>	Previous Year Question Papers Discussion