



## **PRACTICAL FILE OF OPERATING SYSTEM**

### **BTech: III Year**

Department of Computer Science & Information Technology

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**Year : 2022**

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**ACROPOLIS INSTITUTE OF TECHNOLOGY & RESEARCH, INDORE**

**Department of Computer Science & Information Technology**

**Certificate**

This is to certify that the experimental work entered in this journal as per the BTech III year syllabus prescribed by the RGPV was done by Mr. AKASH JAIN in 5th semester in the Laboratory of this institute during the academic year 2020- 2024.

Signature of Head

Signature of the Faculty

# **ACROPOLIS INSTITUTE OF TECHNOLOGY & RESEARCH, INDORE**

## **GENERAL INSTRUCTIONS FOR LABORATORY CLASSES**

### **DO'S**

- Without Prior permission do not enter into the Laboratory.
- While entering into the LAB students should wear their ID cards.
- The Students should come with proper uniform.
- Students should maintain silence inside the laboratory.
- After completing the laboratory exercise, make sure to shutdown the system properly.

### **DONT'S**

- Students bringing the bags inside the laboratory.
- Students using the computers in an improper way.
- Students scribbling on the desk and mishandling the chairs.
- Students using mobile phones inside the laboratory.
- Students making noise inside the laboratory.

## **SYLLABUS**

### **CS-502 – Operating System**

**Branch:** Computer Science Information Technology V Semester

**Course:** CSIT 502 Operating System

#### **Unit I**

Introduction to System Programs & Operating Systems, Evolution of Operating System (mainframe, desktop, multiprocessor, Distributed, Network Operating System, Clustered & Handheld System), Operating system services, Operating system structure, System Call & System Boots, Operating system design & Implementations, System protection, Buffering & Spooling. Types of Operating System: Bare machine, Batch Processing, Real Time, Multitasking & Multiprogramming, time-sharing system.

#### **Unit II**

File: concepts, access methods, free space managements, allocation methods, and directory systems, protection, organization ,sharing & implementation issues, Disk & Drum Scheduling, I/O devices organization, I/O devices organization, I/O buffering, I/O Hardware, Kernel I/O subsystem, Transforming I/O request to hardware operations. Device Driver: Path managements, Sub module, Procedure, Scheduler, Handler, Interrupt Service Routine. File system in Linux & Windows

#### **Unit III**

Process: Concept, Process Control Blocks (PCB), Scheduling criteria Preemptive & non Preemptive process scheduling, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling, operations on processes, threads; inter process communication, precedence graphs, critical section problem, semaphores, and classical problems of synchronization. Deadlock: Characterization, Methods for deadlock handling, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Process Management in Linux.

#### **Unit IV**

Memory Hierarchy, Concepts of memory management, MFT & MVT, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation. Structure & implementation of Page table. Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, and demand segmentation.

#### **Unit V**

Distributed operating system:-Types, Design issues, File system, Remote file access, RPC, RMI, Distributed Shared Memory(DSM), Basic Concept of Parallel Processing & Concurrent Programming Security & threats protection: Security violation through Parameter, Computer Worms & Virus, Security Design Principle, Authentications, Protection Mechanisms. introduction to Sensor network and parallel operating system. Case study of Unix, Linux & Windows.

## **HARDWARE REQUIREMENTS:**

Processors - 2.0 GHz or Higher

RAM - 256 MB or Higher

Hard Disk - 20 GB or Higher

## **SOFTWARE REQUIREMENTS:**

Linux: Ubuntu / OpenSUSE / Fedora / Red Hat / Debian / Mint OS

WINDOWS: XP/7

Linux could be loaded in individual PCs.

### **RATIONALE:**

The purpose of this subject is to cover the underlying concepts Operating System .This syllabus provides a comprehensive introduction of Operating System, Process Management, Memory Management, File Management and I/O management.

### **PREREQUISITE:**

The students should have general idea about Operating System Concept, types of Operating System and their functionality.

### **Lab Plan**

### **Operating System**

### **CS-502**

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**Name of Department-CSIT**

**Name of Laboratory-OS**

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