ST. ALOYSIUS COLLEGE (AUTONOMOUS) JABALPUR M.P.

PART A: Introduction			
Program: **Certificate**	Class: **B.C.A**	Semester: II	Session: 2022-23
Subject- Computer Application			

1.	Course Code	S1-BCAB2T
2.	Course Title	**Operating System**
3.	Course Type (Core Course/Elective/Generic Elective/Vocational	**Minor**
4.	Pre-Requisite (if any)	
5.	Course Learning Outcomes	**After the completion of this course, a student shall be able to do the following:** 1. Describe the importance of computer system resources and the role of operating system in their management policies and algorithms. 2. Specify objective of modern operating system and describe how operating systems and describe how operating systems have evolved over time. 3. Understand various process management concept and can compare various scheduling techniques, synchronization, ad deadlocks. 4. Describe the concepts of multithreading and memory management techniques. 5. Identify the best suited memory management techniques for any process. 6. Describe various file operations, file allocation methods and disk space management. 7. To understand and identify potential threats to operating systems and the security features design to guard against them. 8. Learn to operate the Linux system.
6.	Credit Value	Theory – 4 Credits
7.	Total Marks	Max.MARKS:30+70 Min. Passing Marks:33

PART B: Content of the Course		
No. of Lectures (in hours per week): **2hr Lecture per week**		
Total No. of Lectures: **60 Hrs**		
Module	**Topics**	**No. of Lectures**
I	**Introduction to Operating System**: What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of	10

	Operating Systems- Multiprogramming Systems, Time Sharing system, Distributed Operating System, Real time system, Operating System for Personal Computers, Workstation and Hand-held Devices, Application of various Operating System in real life. Some prevalent operating system – Windows, UNIX/Linux, Android, MacOS, Blackberry OS, Symbian, Bada etc.	
II	**Process Management**: Process Concepts, Process state & Process Control Block. **Process Scheduling**: Scheduling Criteria, Scheduling Algorithms (Preemptive & Non- Preemptive) – FCFS, SJF, SRTN, RR, Priority, Multiple-Processor, Real –Time, Multilevel Queue and Multilevel Feedback Queue Scheduling. **Deadlock** – Definition Characterization, Necessary and Sufficient Conditions for Deadlock. **Deadlock Handling Approaches**: Prevention, Avoidance, Detection and Recovery.	
III	**Memory Management**: Introduction, Address Binding, Logical versus Physical Address Space, Swapping, Contiguous & Non-Contiguous Allocation, Fragmentation (Internal & External), Compaction, Paging, Segmentation, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement Algorithms. **File Management**: Concept of File System (File Attributions, Operations, Types), Functions of File System, Types of File System, Access Methods (Sequential, Direct & other methods), Directory Structure (Single-Level, Two-Level, Tree-Structured, Acyclic-Graph, General Graph). Allocation Methods (Contiguous, Linked, Indexed)	12
IV	**Disk Management**: Structure, Disk Scheduling Algorithms (FCFS, SSTF, SCAN, C-SCAN, LOOK), Swap Space Management, Disk Reliability, Recovery. **Security**: Security Threats, Security policy mechanism, Protection, Trusted Systems, Authentication and Internal Access Authorization, Windows Security.	12
V	LINUX: Introduction, History and features of Linux, advantages, hardware requirements for installation, Linux architecture, file system of Linux – boot block, super block, inode table, data blocks. Linux standard directories, Linux kernel, Partitioning	12

	the hard drive for Linux, installing the Linux system, system – startup and shut-down process, init and run levels. Process, Swap, Paritition, fdisk, checking disk free spaces. Difference between CLI OS & GUI OS, Window v/s Linux, Importance of Linux Kernel, Files and Directories, Concept of Open Source Software.	

PART C : Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Reading
Textbooks: • A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition John Willey Publications. • A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education. • Operating System by Peterson • Linux by Sumitabh Das. • Related books from MP Hindi Granth Akadami Publications.
Reference Book: • G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education. • W. Stallings, Operating Systems, Internals & Design Principles, 8th Edition, Pearson Education. • M. Milenkovic, Operating Systems- Concepts and design ,Tata McGraw Hill. • Operating System design and Concepts by Milan Milenkovie.
Suggestive digital platform web links
https://web.iitd.ac.in/-minati/MTL458.html https://www.cse.iitb.ac.in/-mythili/os/ https://www.youtube.com/watch?v=aCJ3YgoolHQ
Suggested Equivalent online courses
https://nptel.ac.in/courses/106/102/106102132

PART A: Introduction			
Program: **Degree**	Class: **B.C.A.**	Year**: I Year**	Session:**2022-23**
Subject- Computer Application			
1.	Course Code	S1-BCAB2P	
2.	Course Title	**Operating System Lab**	
3.	Course Type (Core Course/ Elective/Generic Elective/Vocational	**Minor**	
4.	Pre-Requisite (if any)	This course can be opted as an elective by the	

		students of Computer Science.	
5.	Course Learning Outcomes (CLO)	**After the completion of this course, a student shall be able to**: • Operating Linux system • Understanding system administration using Vi editor	
6.	Credit Value	**Practical – 2 Credits**	
7.	Total Marks	Max. Marks:**30+70**	Min. Passing Marks:**33**

PART B: Content of the Course		
No. of Lab. Practicals (in hours per week): 1 Hr **Lab. Per week**		
Total No. of Lab: **30 Hrs.**		
	Suggestive List od Practicals	No. of Labs
	Linux: 1. **Linux Directory Commands** : pwd ,mkdir ,rm – rf, ls, cd, cd/, cd ~ 2. **Linux File Commands**: touch, cat, cat>, cat>>, rm, cp, mv, rename 3. **Linux Permission Commands**: su, id, useradd, passwd, groupadd, chmod, groupdel, chown, chgrp 4. **Linux File Content & Filter Commands**: head, tail, tac, more, less, grep, cat, cut, grep, comm, sed, tee, tr, uniq, wc, od, sort, diff. 5. **Linux Utility Commands**: find, bc, locate, date, cal, sleep, time, df, mount, exit, clear, gzip, gunzip. 6. **Linux Networking Commands**: ip, ssh, mail, ping, host 7. **Edit Crontab file**: To wall message on system on particular time automatically. 8. **Vi editor**: Create file, edit, save and quit. Highlighting the searched term within a file, cut, yank, undo.	30
PART C : Learning Resources		
Textbooks, Reference, Books, Other Resources		

Suggested Reading
Textbooks: • Linux by Sumitabh Das • Linux Bible • Topic Related books from MP Hindi GranthAkandami Publication
Suggestive digital platform web links
https://web.iitd.ac.in/-minati/MTL458.html https://www.cse.iitb.ac.in/-mythili/os/ https://www.youtube.com/watch?v=aCJ3YgoolHQ
https://nptel.ac.in/courses/106/102/106102132

PART D: Assessment and Evaluation			
Internal Assessment : Continuous Comprehensive Evaluation (CCE) : 40 **Marks**		**External Assessment**: University Exam (UE) : **60 Marks**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Lab Attendance	10 Marks	Practical record file	25 Marks
		Viva voce practical	10 Marks
Internal Viva	10 Marks	Execution	5 Marks
Practical File	20 Marks	Answer script	20 Marks
Total	**40 Marks**	**Total**	**60 Marks**