

Part A Introduction			
Program : Certificate	Class : BCA I Year	Year : 2021	Session : 2021-2022
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)	Open for all	
5	Course Learning outcomes (CLO)	After the completion of this course, a successful student will be able to: <ul style="list-style-type: none"> • Describe the importance of computer system resources and the role of operating system in their management policies and algorithms. • Specify objectives of modern operating system and describe how operating systems have evolved over time. • Understand various process management concepts and can compare various scheduling techniques, synchronization and deadlocks. • Describe the concepts of memory management techniques. • Identify the best suited process management technique for any process. • Describe various file operations, file allocation methods and disk space management. • To understand and identify threats to operating systems and the security features to guard against them. • Learn to operate the Linux system. 	
6	Credit Value	Theory - 4 Credits Practical - 2 Credits	
7	Total Marks	Max. Marks : 25+75	Min. Marks : 33
Part B - Content of the Course			
No. of Lectures (in hours per week) : 2 Hours per week			
Total no. of Lectures: 60 Hrs.			
Unit	Topics		No. of Lectures
1	Introduction to Operating system: What is operating system? History and evolution of OS, Basic OS functions, resource abstraction, types of operating systems - batch systems, multiprogramming		6

	<p>systems, multiprocessing systems, time sharing systems, distributed OS, real time systems.</p> <p>Operating system for personal computers, workstations and hand-held devices.</p> <p>Application for various operating systems in real world.</p> <p>Some prevalent operating systems – Windows, Unix/Linux, Android, MacOS, Blackberry OS, Symbian, Bada etc.</p>	
2	<p>Process management: Process concepts, process states & process control block.</p> <p>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.</p> <p>Deadlock – Definition, deadlock characterization, necessary and sufficient condition for deadlock.</p> <p>Deadlock Handling Approaches: Prevention, avoidance, detection and recovery.</p>	14
3	<p>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.</p> <p>File management: Concept of file system (File attributes, operations types), function 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)</p>	14
4	<p>Disk management: Structure, disk scheduling algorithms (FCFS, SSTF, SCAN, C-SCAN, LOOK), swap space management, disk reliability, recovery.</p> <p>Security: Security threats, security policy mechanism, protection, trusted systems, authentication and internal access authorization, windows security.</p>	12
5	<p>LINUX: Introduction, History and features of Linux, advantages, hardware requirements, for installation, Linux architecture, file system of Linux – boot block, super block, inode table, and data blocks. Linux standard directories, Linux kernel, partitioning the hard drive for Linux, installing the Linux system, system – startup and but shut-down process, init and run levels, Process, swap, partition, Fdisk, checking disk free spaces.</p> <p>Difference between CLI OS & GUI OS, Windows V/s Linux, importance of Linux Kernel, files and directories. Concept of open source software.</p>	12
6	<p>Indian contribution to the field: the BOSS operating system, open source softwares, growth of LINUX, aryabhatt Linux, contributions of innovators – RajenSheth, Sunder Pichaiect.</p>	2

Part C- Learning Resources			
Text Books, Reference Books, Other resources			
Text Books:			
<ul style="list-style-type: none"> • A Silberschatz, P.B. Galvin, G. Gagne, Operating systems concepts, 8th Edition, John Wiley Publications. • A.S. Tanenbaum, Modern Operating systems, 3rd Edition, Pearson Education. • Operating System by Peterson. • Linux by Sumitabh Das. • मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तकें 			
Reference Books:			
<ul style="list-style-type: none"> • 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 Milenkovic. 			
Suggested 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 D- Assessment and Evaluation			
Internal Assessment:		External assessment: University exam (UE):	
Continuous Comprehensive Evaluation (CCE) : 25		75 marks	
Shall be based on allotted assignments and class tests. The marks shall be as follows:		Time: 02.00 Hours	
Assessment and presentation of assignment	08 Marks	Section (A): Three Very Short Questions (50 Words Each)	03 x 03 = 09 OR 09 x 01 = 9 Marks
Class Test I (Objective Questions)	4 Marks	Nine MCQ Questions	
Class Test II (Descriptive Questions)	5 Marks	Section (B): Four Short Questions (200 Words Each)	04 x 09 = 36
Class Test III (Based on OS commands)	8 Marks	Section (C): Two Long Questions (500 Words Each)	02 x 15 = 30
Total	25 Marks	Total	75 Marks
Any remarks / suggestions:			

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Program : Certificate	Class : BCA I Year	Year : 2021	Session : 2021-2022
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)	Open for all	
5	Course Learning outcomes (CLO)	After the completion of this course, a successful student will be able to: <ul style="list-style-type: none"> • Operate the Linux System. • Do Administration • Use Vi Editor 	
6	Credit Value	Practical – 2 Credits	
7	Total Marks	Max. Marks : 25+75	Min. Marks : 33
Part B – Content of the Course			
No. of Lectures (in hours per week) : 1 Hours per week			
Total no. of Lectures: 30 Hrs.			
Unit	Suggestive list of Practical	No. of Lectures	
	Linux: <ol style="list-style-type: none"> a. Linux Directory Commands: pwd, mkdir, rm-rf, 1s, cd,cd / ,cd~ b. Linux File Commands: touch, cat, cat >, cat>>, rm, cp, mv, rename c. Linux permission commands: su, id, useadd, passwd, groupadd, chmod, groupdel, chown, chgrp d. Linux File Content & Filter Commands: head, tail, tac, more, less, grep, cat, cut, grep, comm, sed, tee, tr, uniq, wc, od, sort, diff. e. Linux Utility Commands: find, bc, loacte, date, cal, sleep, time, df, mount, exit, clear, gzip, gunzip. f. Linux Networking commands: ip, ssh, mail, ping, host g. Edit Crontab file: to wall message on system on particular time automatically. h. Vi editor: create file, edit save and quit. Highlighting the searched term within a file. Cut, yank, undo. 	30 Hrs.	
Part C- Learning Resources			
Text Books, Reference Books, Other resources			
Text Books: <ul style="list-style-type: none"> • Linux by Sumitabh Das • Linux Bible • मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तकें 			
Reference Books:			

Suggested 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/ https://www.youtube.com/watch?v=OHCMfsNpgCc			
Part D- Assessment and Evaluation			
Internal Assessment: Continuous Comprehensive Evaluation (CCE) : 25 Shall be based on allotted assignments and class tests. The marks shall be as follows:		External assessment: University exam (UE): 75 marks Time: 02.00 Hours	
Internal Assessment	Marks	External Assessment	Marks
Hand-on Lab practice	5 Marks	Practical record file	10 Marks
Viva	5 Marks	Viva Voce Practical	15 Marks
Lab Test from Practical	7 Marks	Table works/Exercise assigned (02) in practical exam	40 Marks
Assignments (Chats / model) / Technology Dissemination / Excursion / lab visit / industrial training	8 Marks	Reports of excursion / lab visits / Industrial training / survey / collection / models	10 Marks
Total Excursion / lab visit / Industrial Training is compulsory	25 Marks	Total	75 Marks