



ST. ALOYSIUS COLLEGE(AUTONOMOUS), JABALPUR

Reaccredited 'A+' Grade by NAAC(CGPA:3.68/4.00)
College with Potential for Excellence by UGC
DST-FIST Supported & STAR College Scheme by DBT

Faculty of Science

Bachelor of Science (B.Sc.) V Semester

SUBJECT: COMPUTER SCIENCE

Paper-Elective (DSE-B)

Operating System

Course Outcomes



CO. No.	Course Outcomes	Cognitive Level
CO 1	Describe the importance of computer system resources and the role of operating systems in their management policies and algorithms.	U, Ap
CO 2	Specify the objectives of modern operating systems and describe how operating systems have evolved over time	K, An
CO 3	Understand various process management concepts and can compare various scheduling techniques, synchronization, and deadlocks.	U
CO 4	Describe the concepts of multithreading and memory management techniques.	U, Analyze
CO 5	Identify the best-suited memory management techniques.	U

Credit and Marking Scheme

	Credits	Marks		Total Marks
		Internal	External	
Theory	3	40	60	100
Practical	1	40	60	100
Total	4	200		

Evaluation Scheme

	Marks	
	Internal	External
Theory	3 Internal Exams of 20 Marks (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of the Semester)
Practical	3 Internal Exams (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of the Semester)



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Bachelor of Science (B.Sc.)
V Semester

Subject: Computer Science
Paper: DSE-II, Operating System

Content of the Course

No. of Lectures (in hours per week): 2 Hrs. per week

Total No. of Lectures: 60 Hrs.

Maximum Marks: 60

Units	Topics	No. of Lectures
I.	Introduction to Operating System: What is an Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems- Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real-time Systems.	12
II	Process Management: Process Concepts, Process States & 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, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock. Deadlock Handling Approaches: Prevention, Avoidance, Detection and Recovery.	12
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 Attributes, Operations, Types), Functions of File System, Types of File System, Access Methods (Sequential, Direct & other methods).	12
IV	Disk Management: Structure, Disk Scheduling Algorithms (FCFS, SSTF, SCAN, C- SCAN, LOOK), LINUX: Introduction, History and features of Linux, advantages, Linux architecture, the File system of LINUX - boot block, super block, inode table, data blocks. Linux standard directories, Linux kernel, Partitioning the hard drive for Linux, system - startup and shut-down process, init and run levels. Process, Swap, Partition, fdisk, checking disk free spaces. CLI OS vs GUI OS, Windows v/s Linux, Files and Directories. Concept of Open-Source Software.	12
V	Linux Administration: Types of user- Root and normal user, Multiple logins simultaneously (Ctrl + Alt + F1, F2,F6), who command. Help: what is, --help, man command Basic Commands: For displaying current directory, files and directories of current/absolute/relative location(s), creating, removing, renaming, copying and moving files or directories. Managing multiple processes: connecting processes with pipes, tee, redirecting input-output, changing process priority with nice, cron commands, kill, ps. Managing user accounts- Sudo, users: useradd, usermod, userdel, passwd. Group: Primary & Secondary Group, chgrp, chown, groupadd, groupdel. Permissions: adding and removing permissions.	12

References

Text Books:

- A Silberschatz , P.B Galvin , G. Gagne , Operating System Concepts, John Wiley Publications
- A.S Tanenbaum, Modern Operating System, Pearson Education
- J.L Peterson, Operating System Concepts Sumitabh Das, Linux, TMH

Reference Books:

- G.Nutt, Operating Systems: A Modern Perspective, Pearson Education
- W. Stallings, Operating Systems, Internals & Design Principles, Pearson Education
- M.Milenkovic, Operating Systems – Concepts and Design, Tata McGraw Hill



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Web Links:

- <https://nptel.ac.in/courses/106/102/106102132/>
- <https://web.iitd.ac.in/~mythili/os/>
- <https://www.youtube.com/watch?v=aCJ3YgoolHQ>

List of Practical

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 the system at a particular time automatically.
8. Vi editor: Create a file, edit, save and quit. Highlighting the searched term within a file, cut, yank, undo.
9. Write the Linux command to copy a File to some other location.
10. Write the Linux command to delete a file.



M. PB



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Formatted by: Ms. P Bhatiya