

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

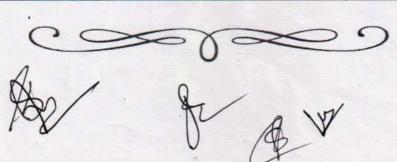
| CO. No. | Course Outcomes | Cognitive Level | | |
|---------|---|--------------------|--|--|
| CO 1 | Describe the importance of computer system resources and the role of operating systems in their management policies and algorithms. | | | |
| CO 2 | Specify the objectives of modern operating systems and describe how operating systems have evolved over time | | | |
| CO 3 | Understand various process management concepts and can compare various scheduling techniques, synchronization, and deadlocks. | | | |
| 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 | | T-4-1 M - 1 |
|---------------------------|---------|----------|----------|-------------|
| The Authority of the Land | | Internal | External | Total Marks |
| 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. | | | |
| П | 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. 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 | | | |
| Ш | | | | |
| 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. | | | |

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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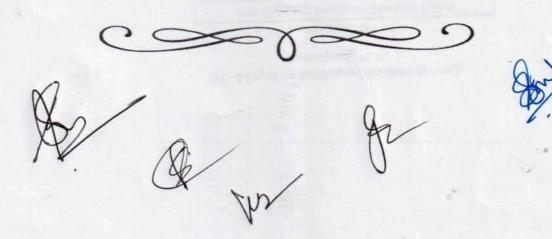
- G.Nutt, Operating Systems: A Modern Perspective, Pearson Education
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Web Links:

- 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,
- 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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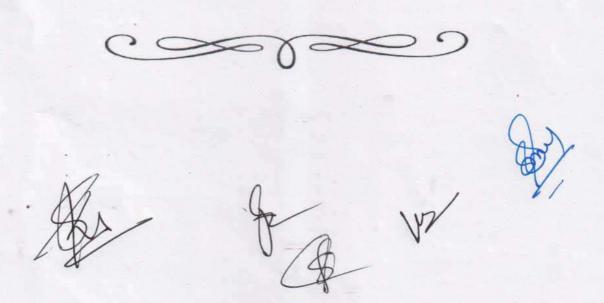
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7. Edit Crontab file: to wall message on the system at a particular time automatically.

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.



Formatted by: Mr. P Bhatiya