MCA (Master of Computer Applications)
MCA (Master of Computer Applications) Semester I

Course Code	PS01CMCA54	Title of the Course	OPERATING SYSTEMS
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	1. To provide basic understanding of the role and functioning of an operating system. 2. To introduce Linux shell environment and programming.

Course Content		
Unit	Description	Weightage* (%)
1.	**Introduction to Operating Systems** - Understanding the role of operating systems - Operating system services - Operating system structure - The concepts of interrupt handling, system call, shell, operating system interface - Virtual machines - Linux Bash shell programming fundamentals - Command-line processing - Bash shell variables, control structures - input, output, integer arithmetic, string operations	25
2.	**Process Management** - The concept of a process - Scheduling of processes - Interprocess communication - Multithreading: concepts, advantages, models - Schedulers: long term, middle term, short term - CPU scheduling: criteria and algorithms - Multiprocessor scheduling - Introduction to process synchronization - The critical section problem and Peterson's solution - The concepts of semaphores and monitors - Introduction to deadlocks	25
3.	**Memory Management and File Systems**	25

	- Basic concepts of memory management - Paging - Segmentation - Virtual memory, demand paging - Page replacement - Introduction to file system management and directory structure - File system mounting - Disk scheduling	
4.	**Linux Shell Programming** - The vim editor - File system manipulation commands - I/O redirection - Regular expressions - Basic filters - The sed and awk commands	25

Teaching-Learning Methodology	Blended learning approach incorporating traditional classroom teaching as well as online / ICT-based teaching practices

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	describe the role and functioning of an operating system.
2.	demonstrate understanding of fundamental concepts related to operating systems.
3.	understand process, memory and file system management.
4.	gain familiarity with Linux command line environment.

5.	use basic Linux commands.
6.	develop Linux shell scripts.

Suggested References:	
Sr. No.	References
1.	Silbetschatz, Galvin, Gagne: Operating System Concepts, 8th edition, John Wiley and Sons, Inc., 2008
2.	Kochan S. G., Wood, P. : Unix Shell Programming, 4th edition, Addison Wesley, 2016
3.	Das S. : UNIX and Shell Programming, Tata McGraw-Hill Education, 2008
4.	Nutt G. : "Operating Systems" : 3rd Edition, Pearson Education, 2004
5.	Tanenbaum A. S., Woodhull A.S. : "Operating Systems Design and Implementation", 3rd edition, Prentice Hall, 2006
6.	Shotts W. : "The Linux Command Line: A Complete Introduction Illustrated Edition", 2nd Edition, No Starch Press, 2019

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