Ganpat University
॥ विद्यया समाजोत्कर्षः ॥

Faculty of Computer Applications

NAAC A Grade Accredited University

Programme	B. Sc. (CA & IT) Honours	**Branch**	Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2026-27	**Effective for the batch Admitted in**	June 2024
Subject code	U15A3OS	**Subject Name**	OPERATING SYSTEM

Teaching scheme

(Per week)	Lecture (DT)		Practical (Lab.)		Total
	L	TU	P	TW	
Credit	2	-	2	-	4
Hours	2	-	4	-	6

Examination scheme(Marks)

	CCE	SEE	Total
Theory	50	50	100

Objective:

The Objective is to learn about concepts of Operating System, Process Management, Process Synchronization, Deadlocks, Logical Memory, Physical Memory, Virtual Memory and Overview of Unix.

Pre-requisites:

Basic knowledge of Operating System and Unix.

Learning Outcome:

Name of CO	Description
CO1	To learn concepts of operating system, process and scheduling algorithm.
CO2	Able to understand classical problem in process synchronization.
CO3	Implement methods to Handle deadlock.
CO4	To Understand the concept of Unix and shell script development.
CO5	Explore the Graphical User Interface of OS with Shell Scripting.

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	2	1	1	1	2	1	1
CO2	2	1	1	1	1	2	1	1	2	2	1	1
CO3	2	1	1	1	1	1	1	1	2	1	1	1
CO4	2	1	1	1	1	2	1	1	3	2	1	1
CO5	2	2	1	2	2	1	2	2	1	2	1	1

Content:

Unit	Content	Hrs.
1	**Operating System Overview and Process Management:** Introduction to Operating System, Types of Operating system, Computing Environments, Operating System Services, System Calls and Types of System Calls, Operating System Structure, Process, Process Control Block (PCB), Process States, Schedulers, Scheduling Queues, Scheduling Algorithms–FCFS, SJF, Priority, Round Robin (RR) etc.	06
2	**Process Synchronization:** Critical section Problem-Mutual Exclusion, Process and Bounded Waiting, Semaphore, Classical Problems in Synchronization - The bounded buffer problem, The Readers and Writers Problem, The Dinning Philosophers Problem.	06
3	**Deadlocks:** Deadlock Characterizations, Methods of Handling Deadlocks, Deadlock Prevention - Mutual Exclusion, Hold and Wait, No Pre-emption, Circular Wait, Deadlock Avoidance - Safe State, Deadlock Recovery.	06
4	**Unix Overview:** Open Source, Open-Source Software, Architecture of Unix, Basic features of Unix, Architecture of the Unix Operating System, Unix Basic Commands.	06

5	**Ubuntu:** Shell and Shell Scripting, Kernel, Command Line Shell, Understanding Shell Scripts: Structure, Syntax, and Usage, Installation of Ubuntu, Ubuntu Desktop Environment, Ubuntu Commands.	06

Practical Content:	
List of programs specify by subject teacher based on above mention topics.	
Reference Books:	
1	Operating System Concept by Silberschatz & Galvin-Wiley, Fifth Edition
2	Operating System, Second Edition by Milan Milenkovi'c - TMH
3	Operating System, Fourth Edition by William Stallings – PHI
4	Unix Shell Programming, by Yashavant Kanetkar - BPB
Web Reference:	
1	www.en.wikipedia.org/wiki/Operating_system
2	www.tutorialspoint.com/operating_system/index.htm
MOOC/Certificate Course:	
1	www.coursera.org/courses?query=operating%20system
2	www.mygreatlearning.com/operating-system/free-courses
3	www.netacad.com/courses/operating-systems-basics?courseLang=en-US
Question Paper Scheme:	
	End Semester Examination Duration: (2 Hours Theory Examination) **Note for Examiner: -** Q-1 Any Five out of Seven (25 Marks) Q-2 Any Two out of Three (06 Marks) Q-3 Mandatory question (05 Marks) Q-4 Any Two out of Three (08 Marks) Q-5 Any Two out of Three(06 Marks) *The question paper must comprehensively address all Course Outcomes (COs), align with Bloom's Taxonomy levels, and ensure complete syllabus coverage.