



Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Third Year Bachelor of Engineering (CE/IT)
(In Effect From Academic Year 2019-20)

Subject Code: CT605C-N	Subject Title: Advanced Operating System
Pre-requisite	

Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
03	00	02	05	04	03	70	30	20	30	150

Course Objective:

- To learn the fundamentals of Operating Systems
- To gain knowledge on Distributed operating system concepts that includes architecture, Mutual exclusion algorithms , Deadlock detection algorithms
- To know the components and management aspects of Real time and Mobile operating systems

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hour
1	Introduction	5
2	Distributed Operating Systems	10
3	Multiprocessor Operating Systems	9
4	Real Time Operating System	10
5	Mobile Operating System	7
6	Database operating Systems	7

Total hours (Theory): 48

Total hours (Lab): 32

Total hours: 80



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Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weight age(%)
1	Introduction : Introduction Functions of operating systems, Design approaches: layered ,kernel based and virtual machine approach, why advanced operating systems, types of advanced operating systems	5	10
2	Distributed Operating Systems : Architecture of distributed operating systems, system architecture types, issues in distributed operating systems, inherent limitation of distribute systems, distributed mutual exclusion: classification of mutual exclusion algorithms, Lamport's, Suzuki-Kasami's Broadcast algorithm, , Distributed deadlock detection, Distributed file systems, Distributed shared memory, Distributed scheduling	10	21
3	Multiprocessor Operating Systems Introduction, structure of multiprocessor operating system, operating system design issues, threads, the test and set instruction, the swap instruction, implementation of the process wait , processor scheduling, reliability and fault tolerance.	9	18
4	Real Time Operating System Introduction to Real time systems and Real Time Operating Systems, Characteristics of Real Time operating Systems, Classification of Real Time Operating Systems, Services, structure, goal and feature of RTOS, architecture of RTOS, micro kernels and monolithic kernels, tasks in RTOS, Performance measures, estimating program runtimes, task assignment, scheduling in RTOS, rate monotonic scheduling, priority inversion, task management, inter task communication, applications of various RTOS.	10	21
5	Mobile Operating System Symbian O.S. : introduction, kernel design in Symbian OS, scheduling in Symbian OS, File systems on mobile phones, I/O in Symbian OS, Application development using Android.	7	15
6	Database operating Systems Introduction to database operating systems, concurrency control: theoretical aspect, distributed database system, concurrency control algorithms	7	15
	Total	48	100

Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.



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Learning Outcome:

On successful completion of this course, the student should be able to:

- Discuss the various synchronization, scheduling and memory management issues
- Demonstrate the Mutual exclusion, Deadlock detection and agreement protocols of
- Discuss the various resource management techniques for distributed systems
- Identify the different features of real time and mobile operating systems

Reference Books:

1. M Singhal and NG Sivaratri, Advanced Concepts in Operating Systems, Tata McGraw Hill Inc., 2001
2. A.S. Tanenbaum, Distributed Operating system, Pearson Education Asia, 2001..
3. A.S. Tanenbaum, Distributed Operating system, Pearson Education Asia, 2001.
4. Real Time Operating System, Barr M.
5. Real-Time Systems, Jane Liu, Pearson Ed. Asia
6. Real -Time Systems, Krishna and Shin, McGraw Hill International
7. Smart phone operating system concepts with Symbian O.S. A tutorial guide by Michael J. Jipping. Symbian Press, Wiley.
8. Application development using Android, Hello, Android, mobile development platform 3 rd Edition by Ed Burnette
9. SILBERSCHATZ and P. GALVIN, Operating System Concepts, VI edition, Addison Wesley 2004.

List of experiments

No	Name of Experiment
1	Write a program that demonstrates Casual Ordering of Events
2	Write a program that demonstrates Lamport's Clock Algorithm for Global Clock
3	Write a program that demonstrates Simple Mutual Exclusion Algorithm
4	Write a program that demonstrates Lamport's Mutual Exclusion Algorithm
5	Write a program that demonstrates Suzuki-Kasami Algorithm
6	Write a program that demonstrates Centralized Deadlock Detection Algorithm
7	Write a Program to implement Concurrent Echo Client Server Application.
8	Study Inter-process communication mechanisms in RTOS environment.
9	Case studies on PalmOS , Symbian OS.
10	Case studies on Linux for Mobile Devices