



K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE

Department of Computer Science & Engineering

M.Tech SECOND SEMESTER SYLLABUS

Course: Advanced Operating System		Semester	II
Course Code	25MSCS201	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03

Examination type (SEE)

Theory

Course Objectives (Course Skill Set)

1. Analyze the characteristics of operating systems for multiprocessor and multicomputer architectures.
2. Understand and address the challenges related to designing operating systems.
3. Explore the latest trends in developing mobile operating systems.
4. Evaluate the implications of these trends on performance and user experience.

Module-1

Multiprocessor Operating Systems: System Architectures- Structures of OS – OS design issues – Process synchronization – Process Scheduling and Allocation- Memory Management.

Module-2

Distributed Operating Systems: System Architectures- Design issues – Communication models – clock synchronization – mutual exclusion – election algorithms- Distributed Deadlock detection.

Module-3

Distributed scheduling - Distributed shared memory - Distributed File system – Multimedia file systems – File placement – Caching.

Module-4

Database Operating Systems: Requirements of Database OS – Transaction process model – Synchronization primitives - Concurrency control algorithms.

Module-5

Mobile Operating Systems: ARM and Intel architectures - Power Management - Mobile OS Architectures - Underlying OS - Kernel structure and native level programming - Runtime issues- Approaches to power management.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Three Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 25 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper consists of Part A and Part B. Part A consists of 10 questions from 5 modules, each carrying 2 marks.
3. Part B consists of 10 questions. Each full question is for 16 marks. There will be two full questions (with a maximum of three sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module.

Suggested Learning Resources:**Books:**

1. M Singhal and NG Shivaratri, Advanced Concepts in Operating Systems, Tata McGraw Hill Inc, 2001

Reference Book:

1. A S Tanenbaum, Distributed Operating Systems, Pearson Education Asia, 2001
Source Wikipedia, Mobile Operating Systems, General Books LLC, 2010.

Skill Development Activities Suggested

The students with the help of the course teacher can take up relevant technical-activities which will enhance their skill. The prepared report shall be evaluated for CIE marks.

Course outcome (Course Skill Set):

At the end of the course the student will be able to :

Sl. No.	Description	Blooms Level
CO1	Analyze the characteristics of operating systems for multiprocessor and multicomputer architectures.	L2
CO2	Understand and address the challenges related to designing operating systems and their implications.	L3
CO3	Explore the latest trends in developing mobile operating systems and evaluate their impact on performance.	L4

Program Outcome of this course:

Sl. No.	Description	POs
1	Engineering Knowledge: Apply knowledge of mathematics, science, engineering fundamentals, and a specialization to the solution of complex engineering problems.	PO1
2	Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles.	PO2
3	Design/Development of Solutions: Design solutions for complex engineering problems and design system components that meet specified needs with consideration for public health and safety, cultural, societal, and environmental concerns.	PO3
4	Conduct Investigations of Complex Problems: Use research-based knowledge and methods including design of experiments, analysis, and interpretation of data, and synthesis of information to provide valid conclusions.	PO4
5	Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools to complex engineering activities with an understanding of limitations.	PO5
6	Engineer and Society / Project Management & Finance: Demonstrate knowledge and understanding of engineering and management principles to manage projects, as well as societal, health, safety, legal, and cultural issues.	PO6

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	x		x			
CO2	x	x		x	x	
CO3	x		x	x		