K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE

Department of Master of Computer Applications

FIRST SEMESTER SYLLABUS

Course: Operating System		Semester	I
Course Code	**25MMC104**	CIE Marks	50
Teaching Hours/Week (L:P:T)	2:0:2	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Examination type (SEE)	**Theory**		

Course Learning objectives:

- Explain the need and services of the operating system
- Explore how the operating system handles processes and manages memory.

Module-1

Introduction to Operating Systems: System Structure What operating systems do, Operating System Operations, Computing Environments, Operating System Services, System Calls, Types of System Calls, System Programs, Operating System Structure, System Boot Process Concept, Process Scheduling, Inter process Communication, Introduction to DevOps.

Number of Hours:8

Module-2

Process Scheduling Basic Concepts: Scheduling Criteria, Scheduling Algorithms, Synchronization Background, The Critical Section Problem, Mutex Locks, Semaphores, Classic Problems of Synchronization: Readers-Writers Problem, Dining Philosophers Problem using Semaphores

Number of Hours:8

Module-3

Deadlocks: System model, Deadlock Characterization, Methods for handling deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock

Number of Hours:8

Module-4

Memory Management Strategies: Basic Hardware, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Virtual Memory Management Background, Demand Paging, Page Replacement

Number of Hours:8

Module-5

File System File concept: Access methods, Directory overview Implementing File System Allocation methods, Free Space Management

Number of Hours:8

Course outcome (Course Skill Set)

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

CO1: Apply the concepts of operating system elements and functionalities to solve real world problems

CO2: Apply scheduling algorithms to solve real world problems.

CO3: Examine and compare different memory management strategies.

CO4: Apply the techniques of process management and demonstrate process Synchronization deadlock handling.
CO5: Examine and compare different file system allocation strategies.

Suggested Learning Resources:

Text Books

- Abraham Silberschatz, Peter Baer Galvin, Greg Gagne: Operating Systems Principles, 10th Edition, Wiley – India, 2019.

Reference Books:

1. D M Dhamdhere: Operating Systems A Concept Based Approach, 3rd Edition, Tata McGraw Hill, 2017.
2. Harvey M Deitel: Operating Systems, 3rdEdition, Addison Wesley, 1990.

Web links and Video Lectures (e-Resources):

1. .https://www.google.com/search?q=Abraham+Silberschatz%2C+Peter+Baer+Galvin%2C+Greg+Gagne%3A+Operating+Systems+Principles%2C+10th+Edition%2C+Wiley+%E2%80%93+India%2C+2019.&oq=Abraham+Silberschatz%2C+Peter+Baer+Galvin%2C+Greg+Gagne%3A+Operating+Systems+Principles%2C+10th+Edition%2C+Wiley+%E2%80%93+India%2C+2019.&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBCDEw OTJqMGo3qAIAsAIA&sourceid=chrome&ie=UTF
2. https://www.youtube.com/results?search_query=Harvey+M+Deital%3A+Operating+Systems%2C+3rdEdition%2C+Addison+Wesley%2C+199

Teaching-Learning Process (Innovative Delivery Methods)

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching-learning process and facilitate the achievement of course outcomes.

1. Lectures with PowerPoint presentations, Interactive discussions and problem-solving sessions, Assignments and quizzes for assessment.

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 (scale down to 25 Marks)
2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs which will be scale down to 25 marks.

The sum of **three**-unit tests, two assignments/Skill Development Activities (CIE), will be 50 marks.

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.