Course No.	Course Name	L-T-P - Credits	Year of Introduction
IT305	Operating systems	3-0-0:3	2016

Pre-requisites: C202 Computer Organization and Architecture

Course Objectives

- To provide basic knowledge of computer operating system structures and functioning.
- To understand the fundamental concepts, processes and communication
- To understand and analyse implementation of: process synchronization
- To know design issues associated with operating systems
- To familiarise with memory management including virtual memory

Syllabus

Introduction: Operating Systems-different types, System kernel, Shell, Processes- . Process Scheduling methods, Inter process Communication, Memory management : fixed &variable partitions - - paging & segmentation - virtual memory concepts - demand paging - page replacement - Device management : disk scheduling algorithms - sector queuing -device drivers. Dead locks - conditions for deadlock - prevention - avoidance - detection – recovery from dead lock -bankers' algorithm. - resource trajectories –starvation, File system concepts – Access methods – Directory structure – Directory implementation – Linear list, Hash table

Expected outcome .

- The student will understand the functions of operating System, system interactions with other parts of computer.

Text Books:

1. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall
2. J. L. Peterson and A. Silberschatz , Operating System Concepts, Addison Wesley.

References:

1. D M Dhamdhere, "*Operating Systems A Concept-based Approach"*, Tata McGraw Hill, New Delhi, 2nd Edition, 2010.
2. William Stallings, Operating Systems,6th Edition,Pearson,2009,ISBN 978-81-317-2528-3
3. Garry Nutt, "Operating Systems – A Modern perspective ", Third Edition, Pearson Education

Course Plan

Module	Contents	Hours	Sem. Exam Marks
I	Introduction: Operating Systems – Batch, Multi programmed, Time-sharing and Real time systems –System calls – System Programs — Simple structure, Layered approach – Kernel, Shell.	6	15%
II	Processes-. Process Scheduling - Round Robin Scheduling – Priority scheduling -multiple queues - Shortest Job First - Guaranteed scheduling - Two- level scheduling. Preemptive scheduling, Dispatcher –Multiple-processor scheduling.	8	15%
	FIRST INTERNAL EXAMINATION		
III	Inter process Communication -Race Conditions - Critical Sections – Mutual Exclusion - Busy Waiting - Sleep And Wakeup - Semaphores - Event Counters - Monitors - Message Passing	6	15%

IV	Memory management : Basics - swapping - fixed partitions - variable partitions - overlay - paging - segmentation - segmented paging - virtual memory concepts - demand paging - page replacement - space allocation policies - dynamic linking ,Thrashing	7	15%
SECOND INTERNAL EXAMINATION			
V	Device management : Physical characteristics – disk scheduling algorithms - sector queuing -device drivers. Dead locks : Deadlock characteristics -conditions for deadlock- prevention - avoidance - detection – recovery from dead lock - bankers algorithm.- resource trajectories - starvation.	8	20%
VI	File System: File concept – Access methods – Directory structure – Directory implementation – Linear list, Hash table – Case study: Linux system.	7	20%
END SEMESTER EXAM			

QUESTION PAPER PATTERN

Maximum Marks: 100 Exam Duration: 3 hours

The question paper shall consist of Part A, Part B and Part C.

Part A shall consist of three questions of 15 marks each uniformly covering Modules I and II. The student has to answer any two questions (15×2=30 marks).

Part B shall consist of three questions of 15 marks each uniformly covering Modules III and IV. The student has to answer any two questions (15×2=30 marks).

Part C shall consist of three questions of 20 marks each uniformly covering Modules V and VI. The student has to answer any two questions (20×2=40 marks).

Note : Each question can have a maximum of 4 subparts, if needed