CA523 OPERATING SYSTEMS

Prerequisite: Computer Organization and Programming Methodology.

Syllabus:

History, Evolution and Philosophy Hardware evolution Economic Forces and constraints Structuring methods: Layered model, object - server model Application needs and significant case histories

Tasking and Processes Tasks, processes Structures; ready list, process control block etc. Despatching, content switches Role of interrupts

Process co-ordination and synchronization Concurrent execution Sharing access, race conditions Deadlock: Causes, conditions, prevention Models and mechanisms (eg. Busy waiting, spin locks, Dekker's algorithm, semaphores, mutex locks, region, monitors)

Scheduling and Dispatch Preemptive and non-preemptive scheduling schedules and policies

Physical and Virtual Memory Organization Physical memory and registers Overlays, swapping, partitions Pages and segments Placement and replacement policies Thrashing, working sets

Device Management Free lists, layout Servers, interrupts Recovery from failures

File Systems and Naming File layout (eg. Indexed, contiguous) Directories, contents and structure Naming, searching, access, backups Fundamental file concepts; basic file Organizations, basic file manipulations, blocking and buffering Sequential files Non sequential files (eg. hashed files, treestructured files, B-trees, multiple key files)

Security and Protection Overview of System security with examples Security methods and devices, protection access, authentication Memory protection Recovery Management

Communications and Networking Protocol suites Streams and datagrams Internetworking and routing Servers, services

Distributed and Real time systems Synchronization and timing Failures, risks and recovery Special Concerns in real-time systems

Text Books:
1. Silberschatz and Galvin, "Operating System Concepts" Addison Wesley fifth edition 1997
2. Tanenbaum "Modern Operating Systems" Prentice Hall India. 1992
3. Stallings "Operating System" PH I Second edition. 1994
4. Crowley "Operating Systems A design Oriented Approach" Tata MacGraw Hill 1998.
References:
1. Beck et al. "Linux Kernel Internals", Addison Wesley Longman, Second Edition 1998
2. U. Vahalia, " Unix Internals", Prentice Hall International 1997.