GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
OPERATING SYSTEMS

Course Code: GR22A2074 **L/T/P/C: 2/1/0/3**
II Year II Semester

Course Objectives:
1. Understand main concepts of OS and to analyze the different CPU schedulingpolicies.
2. Understand process synchronization and deadlock management.
3. Understand memory management and virtual memory techniques.
4. Appreciate the concepts of storage and file management.
5. Study OS protection and security concepts.

UNIT I

Operating System Overview: Objectives and functions, Computer System Architecture, Evolution of Operating Systems, System Services, System Calls, System Programs, OS Structure, Virtual machines.
Process Management: Process concepts, CPU scheduling-criteria, algorithms with evaluation, Preemptive / Non-Preemptive Scheduling, Threads, Multithreading Models.

UNIT II

Concurrency: Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors.
Deadlocks: Principles of deadlock–system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock.

UNIT III

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation.
Virtual Memory: Demand paging, page replacement algorithms, Allocation of Frames, Thrashing.

UNIT IV

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management.
File System implementation: Access Methods, File system structure, file system implementation, directory implementation, allocation methods, free-space management.

UNIT V

Protection: Goals and Principles of Protection, Implementation of Access Matrix, Access control, Revocation of Access Rights.
Security: The Security problem, program threats, system and network threats, implementing security defenses.

TEXT / REFERENCE BOOKS:

1. Operating System Concepts Essentials, 9th Edition by Avi Silberschatz, Peter Galvin,Greg Gagne, Wiley Asia Student Edition.
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings,Prentice Hall of India.

3. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley,Irwin Publishing
4. Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, Addison-Wesley
5. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
6. Operating Systems, R. Elmasri, A. G. Carrick and D. Levine, Mc Graw Hill.
7. Operating Systems in depth, T. W. Doeppner, Wiley.