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| **Course – 49 Title: Operating System** |  |
| **Course No.: CIT-321 Credit : 3 Contact Hours: 3** | **Total Marks: 100** |

**11.1 Rationale:**

Computer Engineers should be competent in Operating System. They must know the basic concepts of operating system, various types of CPU scheduling algorithms, Deadlock problem and some deadlock handling strategies, Paging, segmentation, fragmentation and file-management strategies.

**11.2 Objectives:**

* To implement different types of scheduling algorithms
* To implement various types of page- replacement algorithms in real-life problem
* To apply the Banker’s algorithms in real-life situations to know whether a system is in safe state or not
* To apply deadlock-recovery algorithm to recover from this situation

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| **11.3 Learning Outcomes** | **11.4 Course Content** | **11.5 Teaching  Learning Strategy** | **11.6 Assessment Strategy** |
| * Define process management * Describe two process solution * Discuss Dekker’s algorithm * Illustrate producer-consumer ,readers-writer ,dining philosophers problem | Introduction. Process management: process synchronization and mutual exclusion, two process solution and Dekker's algorithm, semaphores, examples (producer-consumer, readers-writer, dining philosophers, etc.). | * Lecture * Group Assignment | * Assignment * Short answer |
| * Draw Gantt Charts for different types of scheduling algorithm * Illustrate various types of CPU scheduling algorithms | CPU scheduling: multiprogramming and time sharing, scheduling approaches (SJF, FIFO, round robin, etc.). | * Lecture * Case Studies * Assignment | * Exercise * Assignment |
| * Describe device controllers and device drivers | Input/Output: device controllers and device drivers, disks, other devices. | * Demonstration * Group Discussion | * Observation * Self-rating |
| * Illustrate the memory management scheme with and without swapping * Discuss various types of page replacement algorithm | Memory management: with and without swapping, virtual memory - paging and segmentation, page replacement algorithms, implementation. | * Lecture * Reading Assignment | * True or False * Multiple Choice |
| * Discuss the several file systems * Explain directory and data structure | File systems: FS services, disk space management, directory and data structure. | * Lecture * Group Assignment | * Questionnaire * Short Answer |
| * Define deadlock * Explain various methods for handling deadlocks * Illustrate Banker’s algorithm | Deadlocks: modeling, detection and recovery, prevention and avoidance.  Example Systems: Unix, MSDOS. | * Lecture * Group Discussion | * Group Exercise * Assignment * Viva Voce |

RECOMMENDED BOOKS AND PERIODICALS