**CSC231: Data structures and Operating Systems**

**II Operating Systems**

**Course Description**

The course provides the fundamental knowledge of the operating system architecture and components and to know the various operations performed by the operating system. To acquire the concepts of the operating system definitions, its functionalities like job scheduling, time management, memory management and file handling. It also specifies various operating systems and their multitasking behavior.

**Course Learning Outcome**

Upon completion of the course students will be able to:

* Understand the basic working process of an operating system.
* Understand the importance of process and scheduling.
* Understand the issues in synchronization and memory management.

**Unit I - Introduction and System Structures 05 Hrs**

Operating system definition, computer system organization, and architecture, structure and operations, process, memory and storage management.

**Unit II - Process Management 08 Hrs**

Process concepts, scheduling and operations on processes. Process Scheduling: Basic concepts, scheduling criteria, scheduling algorithms, Synchronization: Background, critical section problems

**Unit III – Deadlock 05 Hrs**

Deadlock System model, deadlock characterization, methods for handling deadlock, deadlock prevention, avoidance and detection.

**Unit IV - Memory Management 06 Hrs**

Memory Management Strategies: Background, swapping, Memory allocation, Paging, Structure of the page table.

**Unit V - File system 06 Hrs**

File system structure, directory structure, allocation methods and free-space management. Disk structure, disk scheduling and management.

**Essential Reading**

[1] A. Silberschatz, P.B. Galvin and G. Gagne, *Operating System Concepts,* 8th Edition, NewDelhi: Wiley India, 2011.

**Recommended Reading**

[1] Stalling William, *Operating Systems: Internals and Design Principles*, 7th Edition, Prentice Hall, 2011.

[2] Dietel et al*, Operating Systems,* 3rd Edition, Pearson Education,2004.

[3] A.S. Tanenbaum, *Modern Operating Systems*, 3rd Edition, Prentice Hall, 2007.