JYOTI NIVAS COLLEGE AUTONOMOUS
SYLLABUS FOR 2018 BATCH AND THEREAFTER

Programme: B.C.A   **Semester: II**

OPERATING SYSTEM

Course Code: 18BCAIIT4   **No. of Hours: 60**

COURSE OBJECTIVES:

- To understand the fundamental concepts and techniques of Operating Systems.
- To study the concepts in process management and concurrency control mechanisms
- To understand the concepts in memory managements and deadlocks
- To study on file management and storage structures

LEARNING OUTCOMES:

- An ability to understand basic concepts of operating system.
- An ability to describe process management, scheduling and concurrency control mechanisims.
- An ability to analyze memory management and deadlocks.
- An ability to compare various file systems and its operating systems examples

UNIT I   **10 HRS**
Introduction: Definition - System Components - Operating System Services - System Calls and its types - Types of Operating System in various computing environments – Operating System Structure - Open Source Operating Systems.

UNIT II   **12 HRS**
Process Management: Process Concepts - Process definition - Process State - Process Control Block - Threads.
Process Scheduling – Basic Concepts - Scheduling Criteria - Scheduling Algorithms FCFS, SJF, Priority, Round- Robin)
Thread – Overview – Benefits - User & Kernel Threads And Multithreading Models.
Deadlocks –Characterization - Necessary Conditions - Resource Allocation graph - **Detection** (Single Instance and Multiple Instance) - **Recovery** (Process Termination and Resource Preemption).

UNIT III   **14 HRS**
Memory Management: Swapping - **Contiguous Memory Allocation**- Memory Protection, Memory Allocation - Fragmentation - **Paging** - Basic method - Hardware Support - Protection, Structure of the Page table- Hierarchical Paging - Hashed Page Tables - Inverted Page Table - **Segmentation**- Basic Method – Hardware - Protection and Sharing – Fragmentation **- Demand Paging-** Basic Concepts. Page Replacement- Basics Concepts.

UNIT IV   **12 HRS**

File Management: File Concepts - Attributes – Operations – Types – Structure - Internal File Structure - **Access Methods:** Sequential – Direct – Indexed - **Directory Structures** – Single – level - Two-level - Tree Structured - **Allocation Methods** – Contiguous – Linked – Indexed - **Free Space Management:** Bit Vector - Linked List – Counting - Grouping.

UNIT V   **12 HRS**

Device Management: Overview - **I/O Hardware**- Polling - Interrupts - DMA - **Application I/O interface**- Block and Character devices - Network Devices - Clocks and Timers - Blocking and Nonblocking I/O - **device drivers** - introduction.

REFERENCES:

1. Abraham Silberschatz, Greg Gagne, Peter Galvin. Operating Systems Principles. John Wiley Publications. 2006. 7th Edition.
2. Andrew S Tanenbaum, Modern Operating Systems, Prentice Hall of India Learning. 2009. 3rdEdition.
3. Gary Nutt, Operating Systems. Pearson Education. 3rd edition.
4. D.M. Dhamdhere, Operating Systems: A Concept-based Approach,Tata McGraw-Hill Education-2012 ,3rd edition