Branch: BCA	Semester-I
Subject Code: 1104	Lecture: 04 Credit: 04
Course Opted	Core Course 3
Subject Title	**COMPUTER FUNDAMENTALS AND OPERATING SYSTEM**

Course Objectives:

- To understand the proper working of operating system.
- To develop understanding of Computer operating system, its structures, functioning and algorithms.
- To ensure that students gain a solid understanding of the fundamental concepts modern multitasking operating system.

Course Outcomes:

- Learners will be able to describe basic concepts, mechanisms used by operating systems.
- Learners will be able to compare process scheduling algorithms, apply synchronization primitives and evaluate deadlock conditions and to analyze virtual memory management algorithms.

Module	Sr. No.	Topic and Details	No. of Lectures Assigned	Marks Weightage
UNIT- I	1.	**Introduction:** Definition of Computer, Features, Block Diagram of Computer System, Computer Generations. **Primary Memory Devices:** RAM, ROM, PROM, EPROM, CACHE Memory, Registers. **Number Systems:** Binary, Octal Decimal Hexadecimal and Their interconversion, Computer Arithmetic. **Computer Software:** System and Application Software. Utility programs: Anti-plagiarism software, Anti-virus, Disk Cleaning, Defragmentation, Compression/ Decompression of files. **Types of Computers :** Digital, Analog, Hybrid Computers, General purpose Computers, Micro Computers, Mini Computers, Mainframes, Super Computers	4	8
	2.	**Secondary Storage Devices:** : Sequential and Direct Access Devices, Magnetic and Optical Storage, Flash Drive/USB Pendrive; I/O Devices- Keyboards, Scanners, Digitizers, Plotters, LCD, Plasma Display, Pointing Devices –Mouse, Joystick, Touch Screens Introduction to Network devices – Hubs, Switches, Routers, NAS, MODEM, Access Points **Printers:** Impact and Non-Impact Printers. **Computer Languages:** Machine, Assembly, High Level. **Operating System:** Purpose of Operating Systems, OS Structure, Services of Operating System.	4	8

UNIT-II	3.	**Computer System:** Architecture, Instruction cycle, Process Control Block. **Types of Operating System(Explain concepts):** Single processor systems, Multiprogrammed, Batch, Time sharing- Interactive, Multitasking, Multiprocessor systems, Parallel systems, Distributed systems, Special purpose systems, Real Time systems, Multimedia systems Handheld Systems	8	16
	4.	**Processes:** Concept, process states:-5 state model, Scheduling, Operations on Processes, Cooperating Process and Process Synchronization. **Threads:** Concept, Multithreading models, Threading issues	8	16
UNIT-III	5.	**CPU Scheduling:** I/O burst cycle, Context Switching, Scheduling:-Short Term, Long Term, Scheduling Criteria, Algorithms (FCFS, SJF, RR, Priority). **Memory Management:-**Main memory organization and management, Virtual memory organization:-Paging, Segmentation, Virtual memory management algorithms and issues**.**	8	16
	6.	**Deadlocks:** System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock	8	16
UNIT-IV	7.	**Main Memory:** Background, Logical address space, Physical address space, MMU, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page Table **Virtual Memory:** Background, Demand Paging, Copy-on- Write, Page, Replacement, Allocation of Frames, Thrashing **Mass-Storage Structure:** Overview, Disk Structure, Disk Scheduling, Disk Management.	6	12
	8	**File-System Interface**: File Concept, Access Methods, Directory and Disk Structure	4	8
		TOTAL	50	100

Text Books:

1. P. K. Sinha&PritiSinha , "Computer Fundamentals", BPB Publications, Sixth Edition

2. Silberschatz, Galvin, Gagne "Operating System Principles" John Wiley & Sons, 7th Edition

Reference Books:

1. Dr. Madhulika Jain, "Information Technology Concept", BPB Publication 2nd Edition.
2. Andrew Tanenbaum, Modern Operating Systems, Prentice Hall.
3. William Stallings, Operating Systems, Prentice Hall.
4. Harvey M. Deitel, An introduction to operating systems. Addison-Wesley.
5. Andrew Tanenbaum& Albert Woodhull, Operating Systems: Design and Implementation. Prentice-Hall.
6. Naresh Chauhan, Principles of Operating Systems, Oxford Press
7. Achyut S. Godbole, AtulKahate, Operating Systems, Tata McGraw Hill
8. Abraham Silberschatz, Peter Galvin, Greg Gagne, Operating System Concepts, Wiley,8thEdition