Course : 603 : Operating System

Course Code	603
Course Title	Operating System
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2018
Purpose of Course	Elaborate understanding of Middle Layer which manages hardware and application software.
Course Objective	To understand detailed working of OS
Pre-requisite	Basic knowledge of Computer organization, data structures and computer programming
Course Out come	Students will be able to understand OS internals and learn basic shell scripting
Course Content	**Unit : 1: Operating System Concepts** 1.1 Evolution of Operating System 1.2 Needs of an Operating System 1.3 Elements of an Operating System 1.4 Types of O.S.: Single User & Multi-User, Batch, Multi-Programmed, Time-Sharing, Real-Time, Distributed, Parallel, Mobile 1.5 Operating System Structure: Layered System, Microkernel and Virtual Machine 1.6 Booting process of various Operating Systems **Unit : 2 : Process Management** 2.1 Process concept 2.2 Process State Model 2.3 Process Scheduling 2.3.1 Scheduling Criteria 2.3.2 Scheduling algorithms 2.4 Thread and Multithreading 2.5 Inter-process Communication 2.6 Process Coordination 2.6.1 Critical Section problem 2.6.2 Semaphores 2.7 Deadlocks 2.7.1 Deadlock Characteristics 2.7.2 Deadlock Prevention, Avoidance 2.7.3 Deadlock Detection, Recovery **Unit : 3 : Memory Management** 3.1 The notion of physical and logical address space 3.2 Contiguous allocation 3.3 Non-Contiguous allocation 3.3.1 Paging 3.3.2 Segmentation 3.4 Other Memory Management Schemes: Swapping and Overlays 3.5 Demand Paging & Demand Segmentation 3.6 Allocation of frames & Page Replacement policies

	3.7 Implementation in various operating systems **Unit : 4 : File and Device Management** 4.1 File Management 4.1.1 Device Characteristics 4.1.2 I/O Hardware 4.1.3 Application l/O Interface 4.1.4 Kernel I/O Subsystem 4.1.5 STREAMS 4.2 Mass Storage Structure 4.2.1 Disk Structure 4.2.2 Disk scheduling 4.2.3 Disk Management 4.3 File Concept: File Types and File Operation 4.3.1 Directory Structure 4.3.2 Directory Implementation 4.3.3 File-System Implementation 4.3.4 Allocation Methods 4.3.5 Free-Space Management 4.3.6 File-System Mounting, File Sharing and Protection 4.3.7 Implementation in various operating systems **Unit : 5 : Introduction to Shell Scripting** **5.1** User and system variables **5.2** I/O statements **5.3** Escaping, Quoting Redirection and Piping **5.4** Positional Parameters **5.5** Operators – arithmetic, relational, logical, file related, string related **5.6** Conditional & Looping statements **5.7** Arrays **5.8** Functions **5.9** Grep, egrep and fgrep **Case Study: Windows, Linux and Mobile OS**
Reference Book	1. Operating Systems Concepts - Galvin Silberschatz - McGraw Hill-9th Edition 2. Operating Systems - William Stallings – PHI- 9th Edition 3. Modern Operating Systems - Andrew S. Tanenbaum - Pearson Edu./PHI -4th edition 4. Operating System, Dhamdhere, TMH-3rd Edition 5. Understanding Operating System, Ann McIver McHoes ,Ida Flynn, 5th Edition 6. Operating System, P Balakrishna Prasad, Scitech- 2nd Edition 7. Unix Shell Programming : Yashwant Kanetkar: 2003 Edition 8. Mastering Linux shell Scripting: Andrew Mallett:2015 edition Packt Publisher
Teaching Methodology	Lectures, Discussion, Independent Study, Seminars and Assignment
Evaluation Method	30% Internal assessment, 70% External assessment