GUJARAT TECHNOLOGICALUNIVERSITY
MASTERS IN COMPUTERAPPLICATION
Year –1(Semester–II) (W.E.F. Dec2017)

Subject Name: Operating Systems
Subject Code: 3620003

1. **Learning Objectives:**

   This courseis intended to give studentsbasicconcepts of modern Operating Systems. This will give conceptual insight about how OS design and implementation takes place. Also, it will provide insight about interactions between user application, hardware and OS.

2. **Pre-requisites:**

   - Basic knowledge of computer hardware and software.
   - Knowledge of programming languages like C, C++ etc.

3. **Contents:**

Unit#	CourseContent	Numberof Lectures
1	**Operating System Overview & Processes** **Operating system Overview:** Operating system (OS) objectives and Functions, Evolution of OS, Major Achievements of OS, Developments Leading to Modern OS, Virtual Machines, OS design considerations for multiprocessor and multi-core **Process Description and Control:** Process, Process State, Process Description, Process Control and Execution of the OS. **Threads:** Process and Threads, Types of threads	08
2	**Concurrency Control and Deadlocks** **Concurrency: Mutual Exclusion and Synchronization:** Principles of Concurrency, Mutual Exclusion, Mutual Exclusion: Hardware Support, Semaphores, Monitors, Message Passing, Reader/Writer Problem.	12

	Concurrency: Deadlock and Starvation: Principles of Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, An Integrated Deadlock Strategy, Dining Philosophers Problem		
3	**Memory** **Memory Management:** Memory Management Requirements, Memory Partitioning, Paging, Segmentation. **Virtual Memory:** Hardware and Control Structures, Virtual Memory Management	8	
4	**Scheduling** **Uni-processor Scheduling:** Types of Scheduling, Scheduling, Algorithms, Traditional UNIX Scheduling.	8	
5	**Input / Output and File Management** **I/O Management and Disk Scheduling:** I/O Devices, Organization of the I/O Function, OS Design Issues, I /O Buffering, Disk Scheduling, RAID, Disk cache, File management, i-node Structure.	6	

Suggested Additional Topics for Seminar / Reading:

1) Case Study: Mobile Operating Systems (Android & iOS)
2) Trends in OS (Virtualization and Cloud)
3) VMware and Virtual Box
4) Distributed Processing, Client/Server Architecture and Clusters
5) Operating System Security

4. Main Reference Book(s):
1. StallingW, "OperatingSystems", 7th edition, PrenticeHallIndia.

5. Additional Reference Book(s):
1. Andrew S. Tanenbaum, Herbot BOS, "Modern Operating Systems", Pearson, ISBN 978-93-978-9325-7577-6
2. Silberschatz, A., Peter B.Galvin and GregGagne,"OperatingSystem Principles", Wiley-Indian Edition, 8th Ed., 2009
3.   Ann McHoes,I M Flynn, "Understanding Operating Systems", 8th Edition, Cengage India Publication
4. Bach M J, "The Design of UNIX Operating System", PrenticeHallIndia, 1993.

6. Chapter wise Coverage from Main Reference Book:

Unit#	Topics
1	**Chapter1(1 to 6), Chapter2(1 to 5),Chapter3(1 & 2),**
2	**Chapter4(1 to 6),Chapter5(1 to 6)**
3	**Chapter6(1 to 4),Chapter7(1 & 2)**
4	**Chapter8(1 to 3)**
5	**Chapter10(1 to 7), Chapter 11 (1 & 2)**