Operating Systems (CSC-203)
Tribhuvan University
Soch College of Information Technology
Bachelor of Science in Computer Science and Information Technology

Course Title: Operating Systems
Course no: CSC-203 ---------- Full Marks: 60+20+20
Credit hours: 3 ---------- Pass Marks: 24+8+8
Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)
Course Synopsis: Fundamental concepts of uniprocessor operating systems. Evolution process management, Memory management, File systems, I/O processing.
Goal: This course introduces fundamental concepts of contemporary uniprocessor operating systems.

Course contents:

Unit 1: ---------- 6 Hrs.
1.1. Historical background: Operating system evolution, hardware review, operating system structure. Overview of operating system: batch system, multiprogramming, time-sharing, real-time, mainframe operating systems, personal computer operating systems, system calls.
Unit 2: ---------- 14 Hrs.
2.1. Process management: Process creation, process termination, process states, attributes; thread creation, termination, process scheduling.
2.2. Interprocess communication and synchronization: race conditions, critical regions, mutual exclusion, busy waiting, sleep and wakeup, semaphores, monitors, message passing, classical IPC problems and deadlock.
Unit 3: ---------- 13 Hrs.
3.1. Memory management: Absolute and relocable partition, multiprogramming, swapping, overlays, virtual memory, paging, page replacements algorithms, segmentation, segmentation with paging.
3.2. File systems: file system interface, file system implementation.
Unit 4: ---------- 12 Hrs.
4.1. Device management: I/O hardware and software, software layers.
4.2. Disk management: Disk structure, Disk scheduling, error handling and formatting, RAID, stable storage management.
4.3. Case studies (Linux and Window 2000)

Laboratory works:
Small programming assignments of process creation, termination, deletion, thread creation, terminations, signals handling, process synchronization, process communication, classical IPC problems, file system and I/O handling.

Textbooks:

Andrew S. Tanenbaum, Modern Operating Systems, 2nd Edition, Prentice-Hall. **References:**

Silberschatz, Galvin and Gagne, Operating System Concepts, 6th Edition, Addition Wesley.