**Operating Systems – CS2006**

**General Information:**

**Course:**

Credit Hours: 3 - 1

Prerequisite: Data Structures

**Instructor:**

Name: Sanaa Jeehan

Office #: 33

Phone: (091) 111 128 128 (147)

e-mail: [sanaa.jeehan@nu.edu.pk](mailto:sanaa.jeehan@nu.edu.pk)

**Course Description:**

This course has two components: a theory component to teach students the concepts and principles that underlie modern operating systems, and a practice component to relate theoretical principles with operating system implementation. In the theory component, student will learn about processes and processor management, concurrency and synchronization, memory management schemes, file system and secondary storage management, security and protection, etc. The practice component will complement the theory component through programming assignments illustrating the use and implementation of these concepts.

**Course Learning Outcomes:**

At the end of the course the students will be able to:

* + 1. Describe, discuss and analyze, services provided by the modern Operating Systems. (2)
    2. Understand, design and implement solutions employing concepts of Processes and Threads. (3)
    3. Compare and contrast the commonly used mechanisms for scheduling of tasks and implement synchronization mechanisms like Semaphores, TSL, etc. (4)
    4. Understand and deploy OS concepts related to Virtualization and Containers. (3)
    5. Understand the dead locks and memory management.(1)

**Books:**

1. “Operating System Concepts” by Abraham Silberschatz, Greg Gagne, and Peter Baer Galvin. Ninth Edition (as a Text Book)
2. “Operating Systems Internals & Design Principles” by William Stallings. Ninth Edition (for Additional Reading)

**Course Policies:**

Grading: Absolute

Plagiarism: Zero-tolerance

Attendance: Strict 80% and above

**Grade Distribution:**

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| --- | --- | --- |
| **Evaluation** | **Frequency** | **Weightage (%)** |
| Quizzes | 6 - 8 | 14 |
| Assignments (Handwritten + soft copy) | 3 - 5 | 6 |
| Sessionals | 2 | 30 |
| Finals | 1 | 50 |

**Course Outline (Tentative):**

* Introduction to the Course and the Operating Systems
* Booting Process
* Structure of Operating Systems
* System Calls & Libraries
* Processes
* Signaling, Interprocess Communication
* Threads
* CPU Scheduling
* Synchronization, Locks, Semaphores, Deadlocks
* Process Scheduling
* Memory Management
* Segmentation & Paging
* File System and Devices
* Protection & Security