

ICS 431 Course Syllabus

Course Name: **Operating Systems** (ICS 431 – 01)

Semester: Second Semester (072)

Instructor: Dr. Tarek Helmy

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Office : 22-137-3

Office hours: SMW from 1:30 to 3 PM

COURSE OBJECTIVES

The objectives of this course are:

1. Introduce numerous fundamental concepts and principles of operating systems
2. Expose students to the popular operating system of Linux including hands-on experience.

STUDENTS LEARNING OUTCOMES

1. Recognize operating system types and structure
2. Describe OS support for processes and threads
3. Recognize CPU Scheduling, synchronization, and deadlock.
4. Resolve OS issues related to synchronization and failure for distributed systems
5. Explain OS support for virtual memory, disk scheduling, I/O, and file systems.
6. Identify security and protection issues in computer systems
7. Use C and Unix commands, examine behavior and performance of Linux, and develop various system programs under Linux to make use of OS concepts related to process synchronization, shared memory, mailboxes, file systems, etc.

PREREQUISITES

- ICS 232 – Computer Organization and Assembly Programming
- Topics:

PF2. Algorithms and problem-solving.

PF3. Fundamentals data structure.

AR3. Assembly level machine organization.

AR4. Memory system organization and architecture

TEXT BOOK

• *Operating System Concepts* by Siblingschatz, Galvin, and Gagne. 7th Ed. 2005
Addison Wesley, Inc. (**REQUIRED**)

- *Modern Operating Systems* by Andrew S. Tanenbaum; 2nd Ed, 2003, Prentice Hall, Inc. (OPTIONAL)

- *Operating Systems* by William Stallings. 3rd Ed. 1998. Prentice-Hall, Inc. (OPTIONAL)

- Some handouts or links regarding various topics will be provided on the course website

COURSE CONTENTS & BREAKDOWN

Week	Chapter	Topic
1	1	Introduction (2 hours).
2	2	Operating System Structure (3 hours).
3	3	Processes (3 hours)
4	4	Threads (3 hours)
5	5	CPU Scheduling (3 hours)
6	6	Process Synchronization (4 hours)
7	7	Deadlocks (4 hours)
8	16, 17, 18	Distributed Systems (5 hours)
9	8	Memory Management (3 hours)
10	9	Virtual Memory (3 hours)
11	10, 11	File System Interface and Implementation (3 hours).
12-13	12, 13	I/O Systems and Mass Storage Structure (6 hours).
14-15	14, 15	Security and Protection (3 hours)

GRADING

Lab: Programming Assignments, Tests, and Projects	25 %
Homework Assignments	0 %
Class Participation	5 %
Major Exam I <i>(Wed., 19th of March, 7~9 PM, 14-108)</i>	15 %
Major Exam II <i>(Wed., 23rd of April, 7~9 PM, 24-121)</i>	25 %
Final Exam (20% material of Exam I and II, 80% material after Exam II)	30 %

No make up quizzes or examinations will be given. Homework assignments are given for you for practice. You will not do well in the quizzes and examination if you do not do the homework assignments.