

## CMPS 500: Operating Systems (3 credit hours)

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**Note:** Please e-mail me using both e-mail accounts. This insures that I receive your message. Thanks for your cooperation and understanding.

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### Course Objectives

This course provides the overview of computer system and the operating system, the concepts of process management, memory management, storage management, protection and security issues, and distributed systems

### Prerequisite

None

### Required Textbook

**Title:** Silberschatz, Galvin, and Gagne, “Operating System Concepts with Java,” 7<sup>th</sup> Edition.  
*John Wiley & Sons, Inc. 2007. ISBN: 0-471-76907-X*

### References

- 1) William Stallings, “Operating Systems: Internal and Design Principles,” 5<sup>th</sup> Edition.  
*Prentice-Hall, Inc. 2005. ISBN: 9780131479548*
- 2) Andrew S. Tanenbaum and Albert S Woodhull, “Operating Systems Design and Implementation,” 3<sup>rd</sup> Edition. *Prentice Hall, 2006. ISBN: 9780131429383.*

# Projected Course Schedule

| Topic Covered  |
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| <b>Chapter 1: Introduction</b> <ul style="list-style-type: none"><li>- What Operating Systems Do?</li><li>- Computer-System Organization</li><li>- Computer-System Architecture</li><li>- Computer-System Structure</li><li>- Process, Memory, and Storage Management</li><li>- Protection and Security, ...</li></ul> |
| <b>Chapter 2: Operating-Systems Structures</b> <ul style="list-style-type: none"><li>- Operating-System Services</li><li>- User Operating-System Interface</li><li>- System Calls and Types of System Calls</li><li>- System Programs, ...</li></ul>   |
| <b>Chapter 3: Processes</b> <ul style="list-style-type: none"><li>- Process Concept and Process Scheduling</li><li>- Operation on Processes</li><li>- Inter-process Communication</li><li>- ...</li></ul>  |
| <b>Chapter 4: Threads</b> <ul style="list-style-type: none"><li>- Overview</li><li>- Multithreading Models</li><li>- Thread Libraries</li><li>- Java Threads and Threading Issues, ...</li></ul>   |
| <b>Chapter 5: CPU Scheduling</b> <ul style="list-style-type: none"><li>- Basic Concepts</li><li>- Scheduling Criteria</li><li>- Scheduling Algorithms</li><li>- Multiple-Processor Scheduling, ...</li></ul>   |
| <b>Chapter 6: Process Synchronization</b> <ul style="list-style-type: none"><li>- Background and The Critical-Section Problem</li><li>- Peterson's Solution</li><li>- Synchronization Hardware</li><li>- Semaphores, ...</li></ul>   |
| <b>Chapter 7: Deadlocks</b> <ul style="list-style-type: none"><li>- System Model</li><li>- Deadlock Characterization</li><li>- Methods for Handling Deadlocks</li><li>- Deadlock Prevention and Avoidance, ...</li></ul>   |
| <b>Chapter 8: Main Memory</b> <ul style="list-style-type: none"><li>- Background and Swapping</li><li>- Contiguous Memory Allocation</li><li>- Paging</li><li>- Structure of the Page Table,</li></ul>   |
| <b>Chapter 9: Virtual Memory</b> <ul style="list-style-type: none"><li>- Background and Demand Paging</li><li>- Copy-on-Write</li><li>- Page Replacement</li><li>- Allocation of Frames, ...</li></ul>   |
| <b>Chapter 10: File System Interface and</b>   |

|  |
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| <p style="text-align: center;"><b>File-System Implementation</b></p> <ul style="list-style-type: none"> <li>- The Concept of a File</li> <li>- Access Method</li> <li>- Directory Structure</li> <li>- File-System Mounting, ...</li> </ul>                                  |
| <p style="text-align: center;"><b>Chapter 11: Protection and Security</b></p> <ul style="list-style-type: none"> <li>- Goals of Protection</li> <li>- Principle of Protection</li> <li>- Domain of Protection</li> <li>- Access Matrix, ...</li> </ul>                       |
| <p style="text-align: center;"><b>Chapter 12: Distributed System Structures and Real-Time Systems</b></p> <ul style="list-style-type: none"> <li>- Motivation</li> <li>- Types of Network-Based OSs</li> <li>- Network Structure</li> <li>- Network Topology, ...</li> </ul> |

*Note: As this course schedule is a projection, in the event that it is not exactly followed, we (students and the instructor) will discuss in class the possibilities of adjustment of the overall schedule.*

## Evaluation Method

|                        |     |
|------------------------|-----|
| Attendance and Quizzes | 5%  |
| Assignments            | 5%  |
| *Semester Project      | 30% |
| Test 1                 | 15% |
| Test 2                 | 15% |
| Final Exam             | 30% |

\*The project description, requirements, and deadline will be provided

## Grading Policy

### Grading Scale

|          |     |
|----------|-----|
| 90 – 100 | → A |
| 80 – 89  | → B |
| 70 – 79  | → C |
| 60 – 69  | → D |
| <= 59    | → F |

### How do you calculate your final grade in this course?

Let: D = Attendance, A = Average of all the assignments, P = Project, T1 = Test #1, T2 = Test #2, F = Final Exam, and R = Class average

$$R = D*5\% + A*5\% + P * 30\% + T1*15\% + T2*15\% + F*30\% \text{ or}$$

Exemple: D = 100, A = 90, P = 89, T1 = 85, T2 = 70, and F = 90.

$$\begin{aligned}
 R &= 100*0.05 + 90*0.05 + 89*0.3 + 85*0.15 + 70*0.15 + 90*0.30 \\
 &= 5 + 4.5 + 26.7 + 12.75 + 10.5 + 27 = 86.45.
 \end{aligned}$$

***Your final grade will be B. Note that it is totally the instructor's decision whether to round of the final grade. For example, 86.45 could be round of to 86; Those students who rely on the so called "curving", well I have bad news for you: DO NOT count on it in this course.***

## RULES AND POLICY IN THIS CLASS

Although the rules and policy defined here may seem a little bit rush, they are not meant to cause any harm to you instead to protect you and to prepare you for better life and to become professionals.

- Students are not allowed to bring their family members for day care or baby sitting. The classroom is not a place for children.
- Student behavior/classroom decorum: "Free discussion, inquiry, and expression are encouraged this class." However, classroom behavior that interferes with either the instructor's ability to conduct the classroom or the ability of students to benefit from the instruction is not acceptable.
- Please turn off (or place on silence) your beepers and cellular phones before the lecture starts
- In the event of a situation where student legitimately needs to carry a beeper/cellular telephone to class, prior notice and approval of the instructor is required
- No use of electronic devices while in class unless required or approved by the instructor.
- Classroom behavior which is deemed inappropriate and cannot be resolved by the student and the faculty member may be referred to the Office of Student Life, 2<sup>nd</sup> Floor J. S. Clark Hall Annex; telephone (225) 771-5280, for administrative or disciplinary review as per the code of Students Conduct.
- As part of the academic integrity outlined in the current General Catalogue: "Students are expected to maintain the highest standards of academic integrity. Behavior that violates these standards is not acceptable. Please see the Academic Dishonesty at <http://www.cmps.subr.edu/academicdishonesty.htm>.
- Students are NOT allowed to share their assignments and to communicate during the tests or exam
- No student is allowed in the class if not officially registered in this class.
- ***Late assignment will be penalized as follow after the assignment due date and time: 10% off the first day, 25% off the second day, 50% off the third day, and "Zero" after that. All the assignments will be due in class by to 9:35 AM on the specified due date.***
- No makeup test or exam will be given except in the case of emergency such as the student being sick and he/she is unable to come to class in which case an official Doctor's excuse MUST be presented to the instructor. The student concerned is required to take the make up test/exam no later than two lectures or class periods after he/she returns to class. Failure to comply will result in the grade of zero (0) for the test/exam.
- ***All students are encouraged to attend class and on time. I will be taking rolls randomly. A total of five (5) absences will result in the grade of "F" in this class for the student(s) concerned. It is the student responsibility to make sure that he/she signs the roll I will be passing around in the classroom when one is provided.***
- ***It is totally forbidden to voice or/and video record this course lecture presentations without a written agreement signed and dated between the student and the instructor. Any violation to this rule will result to the invasion of the instructor privacy.***

**Finally, I am totally open to any constructive critics or/and suggestions.**

## **EMERGENCY EVACUATION**

In the case of fire or emergency, please do not panic and simply follow your instructor's emergency procedure evacuations.

## **BLACKBOARD USAGE**

All assignments, notes, and class news will be posted on the Blackboard. In order to be able to use the Blackboard system, you will need to use your SUBR user ID and password.

## **STUDENTS WITH DISABILITY**

“If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with the Office of Disability Services (ODS), 125 Blanks Hall, telephone: (225)771-3546 for further information/assistance. No accommodation will be granted without an official documentation from the ODS.

*I truly appreciate your time, understanding, and cooperation during the course of the semester.  
I am looking forward to working with you individually and in group.  
Feel free to ask me any questions you may have anywhere and anytime. God Bless.*