

## CSC/CPE 4350: Advanced Operating Systems SYLLABUS – Fall 2009

**Professor:** Mike Tindall  
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**Website:** Blackboard. (Check <http://myhome.spu.edu/mht> as an alternate)  
**Office hours:** Monday and Friday 1:30 – 2:30pm *Other times by appointment.*

SCHEDULED MEETING TIMES				
Time	Days	Where	Date Range	Schedule Type
12:30 pm - 1:20 pm	MWF	OMH 215	Sep 28 – Dec 4, 2009	Lecture. Attendance is expected.
10:30 am - 12:30 pm	W	OMH 215	Dec 9, 2009	Final Exam scheduled.

Scheduling exceptions:

- No class: Friday, October 9, 2009: Instructor faculty conference off-campus.
- No class: Wednesday, October 14, 2009: SPU Day of Common Learning. 10:00am Brougham.
- No class: Wednesday, November 11, 2009: Veterans Day holiday
- No class: Friday, November 27, 2009: Thanksgiving holiday

### **Course Description and Learning Objectives**

Prerequisite: CSC/CPE 3350 Operating Systems Programming.

Equivalent: CPE 4350.

Introduces the major functions of operating systems. Covers processes and concurrency; concurrent programming; resource allocation, contention and control; scheduling, memory management and device management.

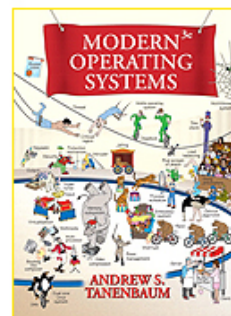
### ***How does this class help prepare you for future success in the computing sciences?***

Students who successfully complete this course (grade of C+ or better) will be able to:

- Articulate the major areas of system software and programming.
- Articulate the responsibilities and services provided by modern operating systems.
- Articulate the alternative organizational and implementation structures of operating systems.
- Articulate the primary O/S concepts of concurrent processes, threads, interprocess communication, synchronization, scheduling, networks and sockets programming, and resource management related to memory, file systems, I/O, and deadlock.
- Discuss the design and features of different operating systems.
- Design and implement programming solutions that utilize concurrency and specific O/S resources and interfaces.

### **Required Text**

***Modern Operating Systems, 3<sup>rd</sup> edition***  
by Andrew Tanenbaum  
Publisher: Pearson Prentice Hall, 2008  
ISBN: 978-0-13-600663-3 (0-13-600663-9)



**Modern  
Operating  
Systems, 3e  
Tanenbaum**

This is an outstanding textbook covering the principles and design of operating systems, as well as extensive information about programming that utilizes the functionality provided by an O/S.

The book leans towards the POSIX/Linux environment, but contains ample detail about the Microsoft Windows environment as well. CSC 4350 Advanced Operating Systems intends to cover most of the primary material in chapters 1-6, plus selections from additional topics and case studies.

**Grading**

(100%) Programming projects implementing typical systems programs or investigating various operating system behaviors and characteristics, and occasional homework exercises or reports.

Homework assignments and projects are an integral part of this course. They are designed provide a structured environment for students to improve their systems programming and design skills. It is likely to be the case that much important student learning about the disciplined approach that is necessary for successful problem solving and systems programming will occur as part of a student's homework activities. Homework may include both written exercises and computer programming assignments.

The following procedures apply to all assignments (unless specifically directed otherwise):

- **Assignments are due at the beginning of class on the due date.** Assignments being turned in before class time should be placed under the instructor's door. DO NOT place any assignments in the instructor's mailbox (unless you don't mind if someone copies your work behind your back!).
- Assignments not turned in when they are due are considered late. **Late assignments will not be accepted or graded.** A "0" score will be recorded for the assignment.
- **Each student will be allowed one exception to the late-assignment policy during this course.** If you contact your instructor and request it, you may turn in one assignment late within one week of the original due date. However, at the end of the quarter, all assigned work is due no later than the beginning of the scheduled final exam time.
- Unless an assignment is specifically designated as a team effort (and some in-class labs might be), **all work is to be done on an individual basis.** At the same time, it is understood that learning from your peers is valid and you are encouraged to talk among yourselves about programming in general and current assignments in particular. Keep in mind, however, that each individual student must do the work in order to learn.

Hence, the following guidelines are established:

- Feel free to discuss any and all *programming* assignments but do not allow other students to copy your code. Do not give any student an electronic or printed copy of any program you write for this class.
- Gaining the ability to properly analyze common programming errors is an important experience. Do not deprive a fellow student of his/her opportunity to practice problem solving: control the urge to show them what to do by writing the code for them.
- If you've given the assignment a fair effort and still need help, see the instructor.
- If there is any evidence that a program or other written assignment was copied from another student, neither student may receive any credit for it (or each may be allowed ½ credit for their "shared" effort).
- Protect yourself: **Handle throw-away program listings carefully.**

**Policy Notes**

1) **Academic Integrity:** The current edition of the SPU *Undergraduate Catalog* describes the University's commitment to academic integrity, which is breached by academic dishonesty of various kinds. Among these is turning in another's work as your own and committing plagiarism, which is the copying of portions of another's words from a published or electronic source without acknowledgement of that source. The penalty for a breach of academic integrity is a failing grade for the work in question on the first offense and a failing grade for the course as a whole with repeated offenses.

2) **Classroom Environment:** Mutual respect and consideration for others make for an effective classroom environment. By following a few sensible guidelines, we can make the classroom a more comfortable place for all.

- **Please turn off your cell phones** at the beginning of class, or set them to silent mode, so you don't disturb our time together.
- **Do NOT use your computer during the class period for anything that is not class-related;** that is rude and disrespectful.
- **Eating and drinking in class**
  - **If your class is scheduled for a lab classroom such as OMH 244,** food and drink are prohibited to protect the equipment. The only exception will be for water bottles, which are to be kept tightly closed when not being used.
  - **If your class is held in a regular classroom** (such as OMH 215 or 245), food and drink may be allowed during class at the discretion of the professor. However, avoid foods with strong aromas and try not to be too distracting when consuming them.
- Always **take care of bathroom visits and other personal needs before class** begins.
- **If you know ahead of time that you need to leave class early,** please let the instructor know and sit near the door so as to cause minimal distraction.

3) **Inclement Weather:** Inclement weather or an emergency may on occasion affect SPU's schedule. In some cases, classes and campus offices may shut-down entirely; in others there may be a late start or an early closure of the campus. Two campus contacts will always carry the most up-to-date information on the campus schedule: the Emergency Closure Hotline (206-281-2800) and the SPU Home Page. Since weather in the Seattle area can change rapidly, check these sites often for updates. If SPU is open but you are unable to travel to campus due to inclement weather, please let your instructor know as soon as possible. Finally, be sure to check your email for any messages from your instructor regarding class activities.

4) **Emergency procedure:** Note the emergency procedures posted in the classroom or laboratory, and note the emergency exits. In case of an emergency (fire, earthquake, hazardous material spillage, bomb threat, etc.), the class will evacuate the building and gather in the **Alumni Center parking lot** to the south of OMH, next to the Metro bus stop on Nickerson. If it is clear that this assembly location is not safe, assemble instead at the southwest corner of **the Ross Parking Lot** at 3rd Ave. W & W. Cremona St. across from the loop. Please stay together as you exit, and be sure to check in with your instructor once you reach the gathering place.

5) **Disability statement:** In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, students with specific disabilities that qualify for academic accommodations should contact Disabled Student Services (DSS) in the Center for Learning. DSS in turn will send a Disability Verification Letter to the course instructor indicating what accommodations have been approved.

6) **Course Evaluation:** I hope that you will participate in an online evaluation of this course and its instructor in a thoughtful and constructive manner. The evaluation data is used to make improvements in the course, and your feedback is considered when selecting textbooks, designing teaching methods and preparing assignments. Courses are evaluated using the Banner Course Evaluation System. All answers are completely confidential - your name is not stored with your answers in any way. In addition, I will not see any results of the evaluation until after final grades are submitted to the University.

### **Attendance if you are ill**

In order to minimize the impact of the current H1N1 influenza pandemic at SPU we ask that students who are experiencing the following symptoms DO NOT attend class:

Sudden fever accompanied by any of the following: [ H1N1 Influenza Symptoms ]

- chills
- headache
- sore throat
- muscle aches
- cough
- vomiting
- diarrhea

You may return to class once your fever is gone for 24 hours without the use of medication. A note from your physician or student health is not required; simply notify the instructor by email prior to missing class. Students who miss class will not be penalized and compensatory assignments will be provided for any work missed. Thank you for your help protecting our community.

### **Professional Code Of Ethics**

From the ACM (Association for Computing Machinery)

<http://www.acm.org/constitution/code.html>

From the IEEE (Institute of Electrical and Electronics Engineers)

[http://www.ieee.org/portal/index.jsp?pageID=corp\\_level1&path=about/whatis&file=code.xml&xsl=generic.xsl](http://www.ieee.org/portal/index.jsp?pageID=corp_level1&path=about/whatis&file=code.xml&xsl=generic.xsl)

### **Mission Statements**

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The mission of the Department of Computing Sciences *is to prepare students to*

- *employ critical thinking skills and efficient computer-based methods to analyze and solve challenging problems,*
- *utilize computing technologies in a socially responsible manner, and*
- *apply their expertise wherever they serve in the world.*

*We seek to provide a well-focused program of studies in the theoretical and applied aspects of modern computing-related disciplines, informed by a Christian world view and graduating students who are equipped for continued professional development and service.*

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The mission of Seattle Pacific University is:

*As a community of learners, Seattle Pacific University seeks to educate and prepare students for service and leadership. We are committed to evangelical Christian faith and values, and to excellence in teaching and scholarship for the intellectual, personal and spiritual growth of students.*

Seattle Pacific University seeks to change the world and engage the culture by graduating students of competence and character, cultivating people of wisdom, and modeling a grace-filled community.

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## Department of Computing Sciences – Goals and Learning Objectives

The Department of Computing Sciences has identified several goals for students enrolled in our programs. Each of the courses in our curriculum are designed to help students achieve specific learning objectives that will help them progress towards these goals. As noted below ( $\Rightarrow$ ), several of these learning objectives are particularly relevant to your studies in CSC/CPE 4350:

**Goal 1: Help students develop problem-solving skills, especially those required to analyze, design and implement solutions involving the use of a computer.**

- $\Rightarrow$  Objective 1: Successful students will acquire the up-to-date technical knowledge and develop the skills needed for a successful start to careers in the computing industry.
- $\Rightarrow$  Objective 2: Successful students will be able to develop solutions to problems that are new to them, and implement these solutions efficiently.
- $\Rightarrow$  Objective 3: Successful students will be able to implement solutions utilizing different computer platforms and programming languages.
- Objective 4: Successful students will develop the skills needed to work in small groups on medium to large scale projects.
- Objective 5: Successful students will develop the ability to write technical documents that include specification, design, and implementation of major projects.
- Objective 6: Successful students will be able to effectively disseminate information and results using both oral and written communication.

**Goal 2: Provide a background in modern computing systems and the theoretical aspects of computer science.**

- $\Rightarrow$  Objective 1: Successful students will acquire the computer science knowledge required for graduate studies.
- $\Rightarrow$  Objective 2: Successful students will understand the architecture, organization and programming of modern computing systems.
- Objective 3: Successful students will understand the mathematical foundations of computer science, algorithm efficiency and computational complexity.

**Goal 3: Challenge students to consider the ethical and social impacts of technology, enabling them to take responsible action informed by a Christian world view.**

- $\Rightarrow$  Objective 1: Successful students will be aware of ethical and social issues related to technology and recognize their impact.
- Objective 2: Successful students will be able to evaluate potential ethical dilemmas and apply decision-making techniques to resolve them.

**Goal 4: Prepare students for continued learning in a rapidly changing discipline.**

- $\Rightarrow$  Objective 1: Successful students will be aware of the rapid rate of change of technology and methodologies in computer science.
- $\Rightarrow$  Objective 2: Successful students will be familiar with ways to gain knowledge and understanding of new developments in computer science and technology.
- Objective 3: Successful students will be aware of alternatives for continuing education in computer science.