CS 3100 Operating Systems
Syllabus

General Information

Semester: Spring 2015
When: Tuesdays and Thursdays, 5:30pm to 7:20pm
Location: SLCC Redwood, Business Building, Room BB 215
Instructor Info: Ted Cowan
tedcowan@weber.edu
(801) 957-4769 (office @SLCC Redwood)
Office hours @SLCC Redwood, Technology Building, First Floor, Room 133:
Mon, Wed and Thu 1pm-4pm by appointment only. Call 801 626-7929 for an appointment.
Website: https://weber.instructure.com/courses/288633

Objectives of This Course

From the catalog: An overview of computer operating systems concepts, system software components with emphasis on installation, management, monitor/supervisor and I/O management, control commands, network installation, and device drivers. The operating systems studied will be Windows or UNIX.

Upon successful completion of this course, students should be able to:

• Understand the purpose of and the services provided by operating systems
• Understand the advantages and potential disadvantages of the four main operating system architectures: ad hoc, layered, microkernel and modular
• Understand many of the internal data structures and algorithms that operating systems use to efficiently manage computing resources
• Understand and be able to use operating system calls to access computing services not available through language-specific library functions
• Understand how operating systems create new processes and threads, and will have practical experience programming these operations in one operating system
• Understand how operating systems synchronize concurrent tasks, and will have practical experience programming these synchronization tasks in one operating system
• Understand and have solved problems relating to task scheduling
• Understand how directories and file systems are implemented
• Understand and have solved problems relating to disk scheduling algorithms

Students with Disabilities

Students who have special needs or disabilities that may affect their ability to access information and/or material presented in this course are encouraged to contact Lee Ellen Stevens, Director of
Disability Support Services (DSS), immediately, on campus at 801 957-4529 for additional disability-related educational accommodations. You are not required to disclose these disabilities to your instructor, but the instructor can only accommodate accommodation requests that officially come through the DSS.

Allotted Time

You should anticipate spending two to three hours of study per week for each credit hour of a university course. Computer and programming classes typically require time in the upper range.

Grading

Your final grade will be determined from your performance in the following areas:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Assignments and Research Paper</td>
<td>50%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm 1</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>20%</td>
</tr>
</tbody>
</table>

Class Format

I will be presenting the lecture material using Powerpoint slides, which will be available in Canvas in advance. Attendance is mandatory. I will also allow time for lab work during class. You may study together as a group but you must turn in your own lab work as an individual.

Questions about the lab or reading material may be asked either in the classroom or in the Instructor’s Blog in Canvas. Students are encouraged to reply to questions in the Instructor’s Blog if they know the correct answer.

Honesty

CS Department policy dictates that any verifiable evidence of student academic cheating, as defined and determined by the instructor, will result in: 1) an automatic failing grade for the class and 2) a report to the Dean of Students that will include the student's name and a description of the student's dishonest conduct. Cheating is defined in the Weber State University Policies and Procedures Manual located at [http://www.weber.edu/ppm/Policies/6-22_StudentCode.html](http://www.weber.edu/ppm/Policies/6-22_StudentCode.html).

Anyone determined to have copied another student's lab assignment, quiz or test will receive a failing grade for the semester. Please do your own work. You may study together but lab assignments, quizzes and tests are to be completed individually and not as a group. Please do not distribute or post solutions to lab assignments or the content of any quiz or test on the Internet.
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Homework

Please complete the reading assignment prior to class. A schedule of reading and lab assignments can be found below. Lab time will be set aside so that lab work may be completed in class. Lab work may be completed at home if sufficient time is not available in class. The icarus server is accessible from anywhere on the Internet using a compatible ssh client such as PuTTY.

Assignments

Lab assignments will be given during the semester. The lab assignments are typically short and should help you to learn operating systems concepts one task at a time. All lab assignments will be tested and passed off on the lab Linux server icarus, unless the instructor makes other arrangements.

You will turn in your lab assignments by marking the assignment complete in Canvas. Don’t upload any files; just mark the lab assignment complete. Your source code must be executable in your ~/cs3100/lab* folder. In your source code please include (1) your name (2) the lab number, (3) a description of the lab (use the same text I put in the Lab assignment) and (4) our course number (CS 3100). I will run the lab as you and ensure that the output of your lab complies with the assignment. If your lab runs without errors and produce the proper output, you will receive full credit for the assignment. If significant features are missing or bugs are found, you will receive a lower score based on the severity of the error. Naming of files is critical to grading so please name your folders and files exactly as specified in the lab description and ensure that your program is executable.

Lab assignments are due on the date listed in Canvas. Please refer to the Calendar in Canvas for lab assignment due dates.

Students will be organized in groups of 3-4 students (mid-semester) to complete a 5-7 page research paper on an emerging operating system technology, which will be due on the last day of the semester.

Quizzes

Quizzes are conducted in class on the days listed in Canvas and based on the material in the associated Lab and chapter. Quizzes may consist of multiple choice, true/false and short answer questions. Your lowest quiz score will be dropped. Quizzes are closed book, closed neighbor and closed Internet. Quizzes cannot be turned in late. You will have about one hour to complete each quiz.

Exams

Two midterms will be administered during the semester in the classroom on the day listed in Canvas. The midterms are based on multiple-choice, true/false or short answer-type questions. An in-class preparation hour will be provided prior to each exam. The Midterms are closed book, closed Internet and closed neighbor. You will have the entire class period to complete each Midterm unless special arrangements are made in advance.
Class Participation

I welcome relevant questions and discussion during class but I reserve the right to limit discussion in the interest of time. You must complete the reading assignment prior to class in order to participate in class discussion in any meaningful way.

Grading Scale

The grading scale will be as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Grade</th>
<th>Percentage</th>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100-94%</td>
<td>B-</td>
<td>83.9-80%</td>
<td>D+</td>
<td>69.9-67%</td>
</tr>
<tr>
<td>A-</td>
<td>93.9-90%</td>
<td>C+</td>
<td>79.9-77%</td>
<td>D</td>
<td>66.9-64%</td>
</tr>
<tr>
<td>B+</td>
<td>89.9-87%</td>
<td>C</td>
<td>76.9-74%</td>
<td>D-</td>
<td>63.9-60%</td>
</tr>
<tr>
<td>B</td>
<td>86.9-84%</td>
<td>C-</td>
<td>73.9-70%</td>
<td>below 60%</td>
<td>E</td>
</tr>
</tbody>
</table>

Miscellaneous

Please place pagers, cell phones and PDAs on silent mode during class. If you must take an emergency call or page, quietly leave the classroom to conduct your conversation.

We will be using computers in the classroom. Please ensure that all classroom computer activity is directly related to the lecture or assignment.

The instructor reserves the right to amend the course schedule, or study material, or to add or subtract lab assignments, quizzes or examinations to best meet the needs of the class.

Your instructor maintains office hours at his office at the SLCC Redwood Road campus. See the Instructor Info section at the top of this syllabus for directions and instructions.

We will not take a break during the class period. If you need to leave the classroom, please do so quietly without disturbing the class.

If class is canceled due to weather or illness of the instructor, an email will be sent to your Weber State email address, a note will be place on the door of the room and an announcement will published on Canvas. Class will only be canceled for weather if SLCC closes the Meadowbrook campus. If weather is severe but class is not canceled, adjustments will be made for quizzes and tests.

No extra credit will be offered for this class.

I will accept late lab assignments with a 25% penalty within one week of the due date, until 7:20pm on the last night of class this semester.

A grade of Incomplete will be given only in extreme circumstances: 80% of the coursework must have been completed and the student must have an extenuating circumstance, such as a death in the immediate family or a severe illness.
## CS 3100 Operating Systems
### Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Tuesday</th>
<th>Thursday</th>
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</thead>
</table>
| 1 Jan 12 | Announcements and Introductions  
Syllabus and Schedule Review  
Ch 1: Introduction | Icarus access and C developer tools  
Ch 1  
Lab 0 |
| 2 Jan 19 | Ch 2: Operating Systems Structures  
C review | Introduction to Linux Operating System Calls |
| 3 Jan 26 | Ch 2: System Calls and C Review  
Error Detection and Reporting | Ch 3: Processes |
| 4 Feb 2 | Ch 3: Processes, pipes and shared memory | Ch 3: Linux Processes  
Producer/Consumer/Bounded Buffer |
| 5 Feb 9 | Ch 4: Threads | Ch 4: Threads  
Linux Pthreads |
| 6 Feb 16 | Ch 4: Threads | Ch 4 |
| 7 Feb 23 | Ch 6: Task Synchronization  
Linux Pthreads and Semaphores | Ch 6 |
| 8 Mar 2 | Ch 6 | Ch 6 |
| 9 Mar 9 | SPRING BREAK | |
| 10 Mar 16 | Midterm 1 Preparation  
Midterm 1 | Midterm 1 Prep, Ch 1-4, 6 |
| 11 Mar 23 | Ch 5: CPU Scheduling | Midterm 1 Post-Mortem  
Ch 5 |
| 12 Mar 30 | Ch 9: File System Interfaces | Ch 9 |
| 13 Apr 6 | Ch 10: File System Implementation | Ch 10 |
| 14 Apr 13 | Ch 11: Mass Storage Structure | Ch 11 |
| 15 Apr 20 | Midterm 2 Preparation | Midterm 2 Prep, Ch 5, 9, 10, 11  
Midterm |
| 16 Apr 27 | Research Papers  
Peer Evaluations | |