Faculty contact information:
Name: Paul Janiczek
Office address: 5057 Woodward, Suite 3216, or meeting room down the hall near printer
Office hour’s time: Tuesday 5:30-6:30, Thursday 2:30PM-3:30PM, or by appointment
Email: janiczek@wayne.edu (begin subject with “CSC4420 :: ” or “CSC4421 :: ”)

Course Description:
Mandatory two-hour closed lab; lecture materials and hands-on exercises which complement CSC4420. System call interface; introduction to operating systems programming; use of simulation to better understand operating systems behavior.

The goals of the course are to help you understand how concepts you learned in lecture are implemented, and provide experience implementing those concepts in a real world operating system.

Credit Hours:
1 Credit Hour (Lab)

Prerequisite:
CSC 2200 and CSC 2201, both with grade of C or better;
CSC 3100 and CSC 3101, both with grade of C-minus or better.

Co-requisites:
CSC 4420 Computer Operating Systems.

Text Book(s):
• Required textbook
• References (Don’t go buy these. Instead, sample as needed. Older editions may suffice):
  Understanding the Linux Kernel by Daniel P. Bovet and Marco Cesati. 3rd edition, O’Reilly Media, 2005.
Computer Programs:
Course work will be performed on a GNU/Linux operating system, using a shell (text based) interface. Any versions of Unix or Linux is acceptable but troubleshooting will only be provided for the distribution provided on lab computers. It is recommended that all work is created in the C programming language, but C++ will be accepted.

*All programs must compile and run on the GNU/Linux distribution provided on lab computers without fault or error.*

VMware Workstation 12 (Windows) and VMware Fusion 8 (Max OS X) are available to WSU Engineering students. You may use VMware software to run a GNU/Linux virtual machine within Windows/OS X on your personal computers. Support and troubleshooting of this or any software on students personal computers is beyond the scope of this course and is not provided. Here is a link for some software provided to WSU Engineering students: [http://apps.eng.wayne.edu/MPStudents/Login.aspx](http://apps.eng.wayne.edu/MPStudents/Login.aspx)

Course contents:
The following is a tentative schedule that may change:

<table>
<thead>
<tr>
<th>Date</th>
<th>Assignment</th>
<th>Due Date</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/05/2017</td>
<td>Warm-Up</td>
<td>09/12/2017 11:00AM</td>
<td>1</td>
</tr>
<tr>
<td>09/12/2017</td>
<td>Lab 01</td>
<td>09/19/2017 11:00AM</td>
<td>2</td>
</tr>
<tr>
<td>09/19/2017</td>
<td>Lab 02</td>
<td>09/26/2017 11:00AM</td>
<td>3</td>
</tr>
<tr>
<td>09/26/2017</td>
<td>Lab 03</td>
<td>10/03/2017 11:00AM</td>
<td>4</td>
</tr>
<tr>
<td>10/03/2017</td>
<td>Lab 04</td>
<td>10/10/2017 11:00AM</td>
<td>5</td>
</tr>
<tr>
<td>10/10/2017</td>
<td>Lab 05</td>
<td>10/17/2017 11:00AM</td>
<td>6</td>
</tr>
<tr>
<td>09/17/2017</td>
<td>Lab 06</td>
<td>10/24/2017 11:00AM</td>
<td>7</td>
</tr>
<tr>
<td>10/24/2017</td>
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<td>10/31/2017 11:00AM</td>
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<td>10/31/2017</td>
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<td>11/14/2017</td>
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<tr>
<td>11/28/2017</td>
<td>Lab 11</td>
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<td>13</td>
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<td>12/05/2017</td>
<td>Lab 12</td>
<td>12/11/2017 11:59PM***</td>
<td>14</td>
</tr>
</tbody>
</table>

The schedule of topics, lecture slides, assignments and their due dates will be frequently updated and posted on Blackboard. So check back often!

Slides, source code presented in class, and other information will be posted to Blackboard.

**Laboratory (lab location)**
0313 STAT (State Hall)  
Section 001: Tu 02:30PM – 04:10PM STAT 313

Course Learning Objectives:

The aim of the course is to enable students to understand a set of abstractions and constructs that are useful in many large-scale software systems, not just operating systems. Specifically, upon course completion, the students should be able to:

1. Learn the design and implementation of prevalent Operating Systems strategies through stage-wise systems software creation that encourages critical thinking (to identify and evaluate system design tradeoffs).
2. Develop a comprehensive understanding of different Operating Systems management primitives, such as process, and resource management; including scheduling, paging, concurrency control, communication, and synchronization. (c, k)
3. Learn modern Operating Systems concepts and techniques, such as SMP, microkernels, clusters, disc allocation, memory management, and Objected Oriented Design (a, b, c, i).
4. Learn threads and multithreading concepts and techniques in Operating Systems (a, b, c, i).
5. Learn Operating Systems functions associated with Input / Output operations and file management (with deadlock avoidance, detection, and recovery).

Student Outcomes (specific to the lab):

a. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
c. An ability to design, implement and evaluate a realistic computer-based system, process, component, or program to meet desired needs.
d. An ability to function effectively on teams to accomplish a common goal.
h. Recognition of the need for, and an ability to engage in, continuing professional development.
j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
k. An ability to apply design and development principles in the construction of software systems of varying complexity.

Assessment:

Attendance: ~10%
Labs: ~90%

Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 - 100%</td>
</tr>
<tr>
<td>A-</td>
<td>85 - 89%</td>
</tr>
<tr>
<td>C</td>
<td>68 - 71%</td>
</tr>
<tr>
<td>C-</td>
<td>65 - 67%</td>
</tr>
</tbody>
</table>
### Course Policies:

**Right to Change Information.** Although every effort will be made to stick to the plan, unforeseen circumstances arising during the semester, ranging from outside issues (extreme weather, power outages, etc.) to student learning issues, may require the adjustment of any material given here, for example, dropping one of the quizzes and adjusting the weights accordingly. Consequently, **given due notice to students, the instructor reserves the right to change any information on this syllabus or in other course materials.**

**Assignments.** Homeworks are a large part of your understanding. Skipping a homework will impact your overall course grade negatively.

**Late policy.** All homework must be uploaded to Blackboard electronically by the due date and time. Blackboard captures the submission date/time. Paper-based submissions will not be accepted. If you have a valid reason for submitting the homework after the announced deadline, please email the instructor. The deadline for homework submissions will be 11:00AM on the day of the following class. The exceptions for this is the week of the Thanksgiving and the last lab – see the table.

**Assignment Submission:** All assignment submissions are to be made using a single, .zip compressed folder to Blackboard. Here is a simple algorithm that can be used:

1) Create a folder
2) Place solution files into folder
3) Compress folder using .zip

Do not tar files. Do not zip or otherwise compress individual files within the folder.

See assignment specifications for additional guidelines.

**Assignment Folder Name Format:** All folders must follow the following naming convention:
Before compression: csc4421_AccessID_Firstname_Lastname_AssignmentName
After compression: csc4421_AccessID_Firstname_Lastname_AssignmentName.zip

Examples:
csc4421_bq0860_Paul_Janiczek_Lab01
csc4421_bq0860_Paul_Janiczek_Lab01.zip

**Assignment File Name Format:** All files must follow the following naming convention:
csc4421_AccessID_AssignmentName_FileDescription.xxx

Examples:
csc4421_bq0860_Lab01_Q1P1.c
csc4421_bq0860_Lab01_Q1P2.txt
Academic Integrity. Academic dishonesty of any type will be dealt with in accordance with the WSU policy. http://www.doso.wayne.edu/academic-integrity.html

A departmental policy requires that the Department be informed of any such issue.

Attendance. Attendance is essential, required and will be tracked. Class participation is highly encouraged and graded as part of the individual contribution. The assignments will be based on the material presented in the lectures and lab, including slides, code, notes on the whiteboard or blackboard.

Religious Holidays:

Because of the extraordinary variety of religious affiliations of the University student body and staff, the Academic Calendar makes no provisions for religious holidays. However, it is University policy to respect the faith and religious obligations of the individual. Students with classes or examinations that conflict with their religious observances are expected to notify their instructors well in advance so that mutually agreeable alternatives may be worked out.

Student Disabilities Services:

- If you have a documented disability that requires accommodations, you will need to register with Student Disability Services for coordination of your academic accommodations. The Student Disability Services (SDS) office is located in the Adamany Undergraduate Library. The SDS telephone number is 313-577-1851 or 313-202-4216 (Videophone use only). Once your accommodation is in place, someone can meet with you privately to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

- Students who are registered with Student Disability Services and who are eligible for alternate testing accommodations such as extended test time and/or a distraction-reduced environment should present the required test permit to the professor at least one week in advance of the exam. Federal law requires that a student registered with SDS is entitled to the reasonable accommodations specified in the student’s accommodation letter, which might include allowing the student to take the final exam on a day different than the rest of the class.

Academic Dishonesty - Plagiarism and Cheating:

Academic misbehavior means any activity that tends to compromise the academic integrity of the institution or subvert the education process. All forms of academic misbehavior are prohibited at Wayne State University, as outlined in the Student Code of Conduct (http://www.doso.wayne.edu/student-conduct-services.html). Students who
commit or assist in committing dishonest acts are subject to downgrading (to a failing grade for the test, paper, or other course-related activity in question, or for the entire course) and/or additional sanctions as described in the Student Code of Conduct.

• **Cheating:** Intentionally using or attempting to use, or intentionally providing or attempting to provide, unauthorized materials, information or assistance in any academic exercise. Examples include: (a) **copying from another student’s code or program**; (b) allowing another student to **copy from your code or program**; (c) using unauthorized material such as a "cheat sheet" during an exam.

• **Fabrication:** Intentional and unauthorized falsification of any information or citation. Examples include: (a) citation of information not taken from the source indicated; (b) listing sources in a bibliography not used in a research paper.

• **Plagiarism:** To take and use another’s words or ideas as one’s own. Examples include: (a) failure to use appropriate referencing when using the words or ideas of other persons; (b) altering the language, paraphrasing, omitting, rearranging, or forming new combinations of words in an attempt to make the thoughts of another appear as your own.

• **Other** forms of academic misbehavior include, but are not limited to: (a) unauthorized use of resources, or any attempt to limit another student’s access to educational resources, or any attempt to alter equipment so as to lead to an incorrect answer for subsequent users; (b) enlisting the assistance of a substitute in the taking of examinations; (c) violating course rules as defined in the course syllabus or other written information provided to the student; (d) selling, buying or stealing all or part of an un-administered test or answers to the test; (e) changing or altering a grade on a test or other academic grade records.

**Course Drops and Withdrawals:**
In the first two weeks of the (full) term, students can drop this class and receive 100% tuition and course fee cancellation. After the end of the second week there is no tuition or fee cancellation. Students who wish to withdraw from the class can initiate a withdrawal request on Pipeline. You will receive a transcript notation of WP (passing), WF (failing), or WN (no graded work) at the time of withdrawal. No withdrawals can be initiated after the end of the tenth week. Students enrolled in the 10th week and beyond will receive a grade. Because withdrawing from courses may have negative academic and financial consequences, students considering course withdrawal should make sure they fully understand all the consequences before taking this step. More information on this can be found at: [http://reg.wayne.edu/pdf-policies/students.pdf](http://reg.wayne.edu/pdf-policies/students.pdf)

**Student services:**
- The Academic Success Center (1600 Undergraduate Library) assists students with content in select courses and in strengthening study skills. Visit [www.success.wayne.edu](http://www.success.wayne.edu) for schedules and information on study skills workshops, tutoring and supplemental instruction (primarily in 1000 and 2000 level courses).
- The Writing Center is located on the 2nd floor of the Undergraduate Library and provides individual tutoring consultations free of charge. Visit [http://clasweb.clas.wayne.edu/](http://clasweb.clas.wayne.edu/) writing to obtain information on tutors, appointments, and the type of help they can provide.
Class recordings:
Students need prior written permission from the instructor before recording any portion of this class. If permission is granted, the audio and/or video recording is to be used only for the student’s personal instructional use. Such recordings are not intended for a wider public audience, such as postings to the internet or sharing with others. Students registered with Student Disabilities Services (SDS) who wish to record class materials must present their specific accommodation to the instructor, who will subsequently comply with the request unless there is some specific reason why s/he cannot, such as discussion of confidential or protected information.

Disclaimer:
The instructor reserves the right to alter this syllabus as necessary.