COMP 4270/6270: Introduction to Operating Systems – Fall 2017

Instructor: Ernest McCracken

5:30pm – 6:55pm, Tuesday, Thursday in FIT 226

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Office Hours:
Tuesday Thursday 12:45 – 1:45 (Instructor)
Also by appointment

Course Description:
COMP 4270/6270. Operating system services, operating system structures; process and thread scheduling; management of asynchronous processes – concurrency, process synchronization, semaphores, monitors; deadlocks; memory management – paging, segmentation, and virtual memory; file system – access and allocation; hierarchy of storage devices. PREREQUISITE: COMP 3160, and either COMP 3410 or EECE 4278.

Resources:

Required Text

Intended Outcomes:
• Theoretical Concepts:
  1. The student will be able to identify basic roles of an operating system(OS).
  2. The student will be able to list the various components of an OS.
  3. The student will be able to identify major issues in the design of an OS.
  4. The student will be able to analyze the tradeoffs involved in the design of an OS.
  5. The student will be able to describe recall well-known algorithms used in operating system designs.
Class Format:
The class will involve lectures by the instructor, individual homework, and paper presentations by students. Basic concepts for each topic will first be introduced by the instructor in lectures. Homework will then be assigned to enhance the understanding of basic concepts.

Prior Class Preparation:
Thorough preparation—by students and instructor—and active participation are essential to a successful course. Learning comes from struggling with the issues outside of class, then discussing them (and the struggle) in class. Unprepared students personally miss out on most of the learning and also cheat their classmates because they cannot contribute fully to the learning that occurs in class.

The instructor will assign readings from books and papers. Each student is expected to have read these before coming to class. This will enhance student learning as well as enhance other students’ learning because more meaningful discussion can take place in the class. Class participation assessment will be done by the instructor.

Assignments, Exams, and Project:
Exams: There will be two exams – one midway through the semester and one on the final exam day. The exams will be open book and open notes but closed neighbor and closed computers (laptops, desktops, PDAs, cell phones, etc.). The final exam will be comprehensive.

Homeworks: There will be individual homeworks based on the course content. All homeworks are to be submitted to http://elearn.memphis.edu.

Evaluation:
Final Grades:
An individual’s grade will be composed of his/her team’s score as well as his/her individual score as described in the following table.

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Evaluation Homework (Individual, Team) 25%</th>
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</thead>
<tbody>
<tr>
<td>Midterm Exam 1</td>
<td>25%</td>
</tr>
<tr>
<td>Midterm Exam 2</td>
<td>30%</td>
</tr>
<tr>
<td>Paper Presentations</td>
<td>15%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>10%</td>
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</tbody>
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Assignment of letter grade will be determined based on performance of the class. Current plan is:
A+: >= 95, A: >= 90, A-: >= 87.5, B+: >= 82.5, B: >= 80, B-: >= 77.5, C+: >= 72.5, C: >= 70, C- : >= 67.5, D+: >= 62.5, D: >= 60, F: < 60.

Grading Criteria for Honors Enrollment:
If you are taking the course for Honors credit, there will be one extra assignment. In addition, the grading criteria will change to the following:


Course Policies:

Attendance:

You are required to attend every class unless there is a documented emergency. The instructor may check attendance at the beginning of every class. If you miss a class, you will have to make your own arrangements to learn the materials covered in that class and to know of any announcements made in that class. Class participation is worth 15 points, of which attendance is a major portion.

Late Policy:

Homework and reports are due before class on the due date. For every 24 hours that an assignment is late, 20% of the total score will be deducted. For every day that an assignment is late, 20% of the total maximum credit will be deducted. For example, if an assignment is worth a maximum of 10 points, it will be worth only a maximum of 8 points upon expiration of the deadline.

Any homework or reports submitted 5 days after the due date and time will NOT be accepted (submit all your homework on eLearn).

Testing Policy:

There will NOT be any makeup quizzes or exams unless there is a documented emergency, so it is very important for you to attend every lecture and exam.

Plagiarism/Cheating Policy: (These paragraphs are mandatory.)

Plagiarism or cheating behavior in any form is unethical and detrimental to proper education and will not be tolerated. All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but appropriate references must be included for the materials consulted, and appropriate citations made when the material is taken verbatim.

If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor’s discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to: http://www.people.memphis.edu/~jaffairs/
Course Outline Tentaive list of lecture topics or chapter sections by week or lecture meeting days.

Lecture Lecture Topics (Tentative)

1 Course Overview and Introduction to OS (Ch 1)
2 Introduction to OS (Ch 1) contd.
3 Overview of various Operating Systems
4 Operating System Structures (Ch 2)
5 Operating System Structures (Ch 2) contd.
6 Processes (Ch 3)
7 Processes (Ch 3) contd.
8 Threads (Ch 4)
9 CPU Scheduling (Ch 5)
10 CPU Scheduling (Ch 5) contd.
11 Process Synchronization – Semaphores, Monitors, Atomic Transactions (Ch 6)
12 Process Synchronization contd.; Review
13 Midterm Exam 1
14 Deadlocks – Avoidance, Detection, and Prevention (Ch 7)
15 Deadlocks contd.
16 Memory Management (Main Memory) (Ch 8)
17 Memory Management (Main Memory) (Ch 8)
18 Memory Management (Virtual Memory) (Ch 9)
19 Memory Management (Virtual Memory) (Ch 9)
20 File System Interface (Ch 10)
21 File System Implementation (Ch 11)
22 Mass Storage Structure (Ch 12)
23 Final Exam Review

Final Exam Day
FinalExam