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|----------------------------------|--|----------------------|----------------------------------|
| Course Number/Section and Title: | COMP 3400-01 Operating System and Network Fundamentals | | |
| Semester and Year: | Spring 2017 | | |
| Course Meeting: | MW | 9:25-10:35 | Roush 210 |
| | TR | 10:00-11:45 | Towers 107B |
| | Days | Time | Location |
| Credit Hours: | 4 | 2.7 | 1.3 |
| | Total Credit Hours | Lecture Credit Hours | Lab Credit Hours (if applicable) |

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|-------------|---|---|
| Instructor: | Pete Sanderson | psanderson@otterbein.edu |
| | First, Last | Email Address |
| | Towers 011 | 823-1317 |
| | Office Location/Room # | Office Phone Number |
| | 12-2 TR (until Spring break), 1-3 MW (after) | @DrPeteOU on Twitter |
| | Set Office Hours (Days and Time) Also available by appointment. | Other Number or preferred contact information |

Course Catalog Description, including pre- or co-requisite course work or other required items. Introduction to the principles, design, and functions of computer operating systems and networks. Emphasis on process, processor and memory management; network operating systems; Internet and local area network structures and protocols; network applications software; and security. Lecture and Laboratory. Prerequisite: COMP 2100

Course Objectives (learning outcome goals or student learning outcomes for the course)

By the end of this course you will be able to:

- describe the major functions and components of a computer operating system;
- recognize the issues associated with shared usage of resources;
- reason about alternative methods for process, processor, memory and file management;
- interact with the Linux operating system from a command interface;
- implement C programs utilizing system calls to perform operating system functions.
- implement multi-threaded Java programs;
- describe the major functions, protocols, and data units of the Internet protocol stack layers;
- describe the software architecture underlying popular Internet services such as the World Wide Web;
- describe the layered architecture of Ethernet-based local area networking;
- reason about alternative methods and algorithms for data transmission, delivery, routing, and security;
- design and implement client and/or server software for specialized Internet-based applications.

Program Learning Goals or Outcomes, as applicable (major, INST, FYE, SYE, HNRS, WI)

We have defined a set of 11 Student Learning Outcomes (SLO) for the Computer Science major. Your work in this course contributes primarily to the following SLOs:

2. Students can methodically solve algorithmic problems.
6. Students can apply development practices and processes to a variety of problems.
7. Students can independently learn and apply new methods and tools.
8. Students can effectively present a curricular topic to an audience.

Required Texts and/or Ancillary Materials

You will be assigned readings from the lecture notes on the course web site (<http://faculty.otterbein.edu/PSanderson/COMP3400>), along with other provided sources.

Attendance and Participation Policy

We will follow some active learning practices in the classroom and particularly in the lab, including collaborative activities and projects. Your attendance and participation is essential to not only your success but also to the success of your collaborators. You are however tuition-paying adults capable of assessing the consequences of not attending class and lab sessions. I do not assign points for attendance or participation.

Method for determining course grade

Your grade is based on a final course score in the range 0 to 800. The components of this score and their weights are as follows: two midterm exams 200 (25%), final exam 200 (25%), programming projects 200 (25%), term papers and presentations 120 (15%), exercises and quizzes 80 (10%). Ranges in the chart represent a 90-80-70-60 scale with 2% plus or minus on either side.

| Range | Grade | Range | Grade | Range | Grade |
|-----------|-------|-----------|-------|-----------|-------|
| 736 - 800 | A | 640 - 655 | B- | 544 - 559 | D+ |
| 720 - 735 | A- | 624 - 639 | C+ | 480 - 543 | D |
| 704 - 719 | B+ | 576 - 623 | C | 0 - 479 | F |
| 656 - 703 | B | 560 - 575 | C- | | |

Assignments/Tests and expectations for out-of-class work

Exams: There will be two midterm exams and a comprehensive final exam. Exams cover lecture, projects and presentations. Make-ups will be scheduled only for documented emergencies.

Quizzes: I will post short quizzes on Blackboard. Quizzes will be worth 5-10 points and must be completed *prior to* the classroom discussion of their topics. This will encourage you to read assigned material in advance.

Lab Projects: I will assign several programming projects to be solved either individually or in pairs. They will help you further develop not only technical skills but also your teamwork and interpersonal skills.

Term Papers and Presentations: I will assign two term papers and presentations, one on an operating systems topic and one on a networks topic. These will develop your analytical skills as well as your technical writing and oral presentation skills.

Deadlines for submitting work

Online quizzes must be completed by the provided deadline, normally the start of the class period for that material. Deadlines are enforced automatically by Blackboard. Programming projects and quizzes are assigned a due date and will incur a 10% per day penalty for late submission.

Final Exam Date and Time

Wednesday April 26, 8:00-10:45

Course, major, program or department-specific formats, policies and procedures, as applicable (e.g., specifics for field work, respect for others, lab safety, distance/online, discussion guidelines, student participation in co-curricular activities such as INST and FYS-approved events)

Does not apply.

Academic Honesty

This class will include both individual and collaborative assignments. In either case, you are encouraged to help each other learn the course material. Participants in these discussions enjoy the benefit of deeper and greater learning.

For individual assignments, the work you submit for evaluation must be your own; created by you while thinking it through. Any individual work submitted for evaluation (assignments and exams) that includes work done by another, copying of another's work, or the result of following another's step-by-step keystrokes and mouse clicks, violates the academic integrity policy of this course. For team assignments, the work you submit will be the product of the team. Taking credit for work that you did not participate in also violates the academic integrity policy of this course.

When academic misconduct occurs as described above, you will receive a zero grade for that assignment or exam. The misconduct may also be reported to the Office of Academic Affairs. If a previous academic misconduct offense is on your record, you will receive a grade of F for this course and a referral to the judicial system.

The complete statement on Plagiarism, Cheating and Dishonesty can be found in the [Campus Life Handbook](#), page 33, at the following web link: <http://www.otterbein.edu/public/CampusLife/HealthAndSafety/StudentConduct.aspx>.

Learning Differences

If you have a documented learning difference please contact Kera McClain Manley, the Disability Services Coordinator, to arrange for whatever assistance you need. The Disability Services is located in Room #13 on the second floor of the Library in the Academic Support Center. You are welcome to consult with me privately to discuss your specific needs. For more information, contact Kera at kmanley@otterbein.edu, 614-823-1618 or visit the Disability Services at the following web link:

<http://www.otterbein.edu/public/Academics/AcademicAffairsDivision/AcademicSupportCenter/DisabilityServices.aspx>.

Statement on Credit Hour Definition/Expectation for Student Work

For each credit hour of classroom or direct faculty instruction, students are expected to engage in two hours of out-of-class course-related work (readings, homework, studying, project preparation, etc.). Most Otterbein classes meet four hours per week in-class with expectation for an additional eight hours of out-of-class work. This class however combines classroom and lab activities. Lab projects are designed to be completed during the lab periods but depending on your learning style you may require additional time either in the lab during open hours or on your own computer. Since this course meets about six hours per week when combining classroom and lab, our expectation is you will spend an additional six hours per week in out-of-class course-related work.

COMP 3400 Spring 2017 Schedule

| Week | Date | Topics |
|------|----------------|--|
| 1 | Jan 9-13 | Operating System Structures Processes |
| 2 | Jan 16-20 | (no class Monday for MLK) Threads |
| 3 | Jan 23-27 | CPU Scheduling Process Synchronization (classroom TBD) |
| 4 | Jan 30 - Feb 3 | Process Synchronization Deadlocks |
| 5 | Feb 6-10 | Midterm Exam over Process Management Main Memory |
| 6 | Feb 13-17 | Virtual Memory File Systems |
| 7 | Feb 20-24 | File Systems Protection (classroom TBD) |
| 8 | Feb 27 - Mar 3 | No classes Spring Break |
| 9 | Mar 6-10 | Security Security |
| 10 | Mar 13-17 | <i>Case Study Presentations</i> Midterm Exam over Topics since first exam |
| 11 | Mar 20-24 | Networks and the Internet – Introduction, Circuit Switching Networks and the Internet - Packet Switching, Internet Structure (room TBD) |
| 12 | Mar 27-31 | Application Layer (Intro, HTTP) Application Layer (DNS, P2P, Sockets) |
| 13 | Apr 3-7 | Transport Layer (Basic Service, UDP) Transport Layer (Reliable Delivery, TCP) |
| 14 | Apr 10-14 | Network Layer Data Link Layer |
| 15 | Apr 17-21 | Selected Network Security Topics <i>Case Study Presentations</i> |
| 16 | Apr 24-28 | <i>Review</i> (classroom TBD) Comprehensive Final Exam. 8:00 a.m. Wednesday Apr 26 |