CS 453: Operating Systems

Fall 2017

Contact Information

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Class website: `http://cs.boisestate.edu/~amit/teaching/453/cs453.html`

Catalog Description

CS 453 OPERATING SYSTEMS (3-0-3)(F,S). Process management, concurrency, interprocess communication, synchronization, scheduling, memory management, file systems and security. Case studies of multiple operating systems. PREREQ: CS 230, CS 253, CS 321 and ECE 330.

Goals

By taking this course, a student will be able to:

- explain the structure of an Operating System,
- explain the function of an Operating System,
- solve problems arising in Operating System design and implementation,
- describe strategies used to implement commonly used Operating Systems,
- write concurrent system programs that run correctly,
- create a large piece of system software in stages and
- analyze the impact of system software on individuals, organizations and society.

Textbook

None

References

- Other useful textbooks.
  - *Operating Systems: Principles and Practice* by Thomas Anderson and Michael Dahlin.
  - *Modern Operating Systems (3rd edition)* by Andrew S. Tanenbaum.
  - *Operating Systems Concepts (7th or 8th edition)* by Abraham Silberschatz, Peter Baer Galvin and Greg Gagne.

  The following books are helpful with systems programming.

  - *The C programming language (2nd edition)* by Brian W. Kernighan and Dennis M. Ritchie.
  - *Advanced Programming in the UNIX Environment* by W. Richard Stevens.

  The following books give specific details about the internals of Linux and Microsoft Windows.

  - *Linux Kernel Development* by Robert Love.
  - *Microsoft Windows Internals (Part 1 and 2) (6th edition)* by Mark E. Russinovich and David A. Solomon.

  The following book is an excellent introduction to using the shell and writing shell scripts. It also covers some systems programming in C.

  - *The UNIX Programming Environment* by Brian W. Kernighan and Rob Pike.

Topics

- Introduction.
- Process Management.
- Scheduling.
- Basic Synchronization Principles.
- High-level Synchronization and Deadlock.
- Device Management.
- Memory Management.
- Virtual Memory.
- File Management.
- Security.
- Examples from Linux, Microsoft Windows and Mac OS X.

Grading

- Participation and attendance [10%]
  - **Attendance is mandatory**. Please review the University policy on attendance for any questions.
    `https://registrar.boisestate.edu/registration/attendance-policy`
- Homework and Programming Projects [60%]
- Quizzes [15%]
- Final Examination [15%]

Online Discussion

We will be using *Piazza* for class discussion. The system is catered to getting you help fast and efficiently from classmates, the Graduate Assistant, and the instructor. Rather than emailing questions to the teaching staff, please post your questions on Piazza. Find our class discussion forum page on Piazza at:

`https://piazza.com/boisestate/fall2017/cs453/home`

Please note that all important announcements will be made on Piazza so it is your responsibility to keep up. You should have already received an invitation to join Piazza. Please contact the instructor if you cannot locate the invite.

Homework and Programming Projects

There will be several types of assignments throughout the semester. Written communication skills are assessed in documentation for programming assignments. Documentation is an integral part of projects. Writing is expected to be professional, which includes adhering to grammar, spelling, capitalization, formatting and punctuation standards.

Programming assignments require the implementation of working programs using the language constructs and techniques introduced in class. Programs must execute and compile on the CS lab machines using the installed compiler. Any programming assignment that does not compile and run on the CS lab machines will not be graded. Late homework will not be accepted. All work is to be done individually unless explicitly allowed by the instructor. There may be group assignments during this class and those will be clearly marked.

Unless otherwise stated, hiring a tutor that has not been approved by the instructor or by the University could be considered academic dishonesty and could result in immediate failure of the course. If you wish to hire your own personal tutor then you must first contact your instructor.

Exams and Quizzes

- Final: Monday, 11th December, 3:00pm - 5:00pm
- All quizzes will be in-class. No makeup quizzes will be given except for University approved absences.

Academic Honesty

Students are expected to work on their own unless explicitly instructed otherwise. Students who copy from each other or from any other source on assignments will be considered to be cheating as will students who allow their work to be copied. **Cheating is grounds for immediate failure of the course**. This includes trying to find answers to problems, programs, and exams from the Internet or other sources (and uploading your completed assignments to Internet sites that are publicly accessible). For more information, please visit the University's web page regarding academic integrity.

`http://registrar.boisestate.edu/general-information-and-policies/academic-integrity`

University Attendance Policy

Students are expected to attend classes regularly. Missing one of two first classes may result in your automatic withdrawal from the class. (See `http://policy.boisestate.edu/academic-affairs-faculty-administration/policy-title-faculty-initiated-withdrawal/`)

Disability Office

Students with disabilities needing accommodations to fully participate in this class should contact the Disability Resource Center (DRC). All accommodations must be approved through the DRC prior to being implemented. To learn more about the accommodation process, visit the DRCs website `http://drc.boisestate.edu`

Building Safety

Knowing how to behave in an emergency situation is important for students. Please review CCP Building Safety Document at `http://coen.boisestate.edu/cs/safetydocument`