

Thesis Course Syllabus

Course Information

Course Prefix and Number: CS4210 / CS6210

Course Name: Advanced Operating Systems

Instructor: Ada Gavrilovska

Course Description

CS6210 Advanced Operating Systems is a graduate level course that covers in detail many advanced topics in operating system design and implementation. It starts with topics such as operating systems structuring, multithreading and synchronization and then moves on to systems issues in parallel and distributed computing systems. There is no textbook for this course. Rather, we will read and discuss a number of important research papers that have been published. For each paper that is covered in class, students are expected to gain a solid understanding of the problem that is addressed by the paper, and the solution proposed by the authors.

CS4210 Advanced Operating Systems is an advanced undergraduate course, cross-listed and held jointly with CS 6210. Undergraduate students will be exposed to the same content as students in the graduate section. Undergraduate students will receive instructions on any differences in the evaluation criteria for their exams and projects.

Course Learning Outcomes

1. *Operating systems concepts, architectures and mechanisms:* Upon successful completion of this course, students will acquire solid knowledge about the principles and practice of operating systems, their development, and their implementation. This includes knowledge about OS structures, multicore and multi-process operating systems, distributed operating systems, datacenter systems like those run by large Internet companies, and distributed systems, as when multiple datacenters are used to satisfy world-wide customer demand.
2. *State-of-the-art developments in systems software design:* Upon successful completion of this course, students will be familiar with multiple systems software designs and understand their implications on the design of popular real-world systems.
3. *Practical experience with implementing systems software functionality:* Upon successful completion of this course, students will learn common techniques to implement advanced systems software features, will be able to design and develop scalable and performant systems software services, targeting either single node or distributed environments, and gaining practical experience through a series of programming assignments.

Required Course Materials

No textbook is required for this course. The course material includes required reading of research papers (often partial reading only) associated with each lecture. All research papers, required reading, and recommended reading will be provided as PDFs.

Grading Policy

Assignment Distribution and Grading Scale:

Assignments	Weight
Programming assignments	50%
Mid-Term Exam	20%
Final Exam	25%
Class Participation	5%
Total	100%

A passing average grade is required in both the projects and the exams in order to pass the class.

Projects:

This course is project intensive and will have a sequence of four projects. Strong C programming skills are absolutely essential for completing these projects. Students can either do the entire sequence of assigned projects or they can choose to define a project that fits more closely with their individual research goals as a replacement of the projects after the first one. The first project is to be completed individually by everyone. For the student-defined project option, the project must be approved by the instructor.

Exams:

The exams will be based on the material covered in the course lectures and on the assigned required reading. The exams will be open access to papers, proctored via HonorLock, and are not cumulative.

Participation:

Class participation will consider your participation during the lecture sessions or on the class Piazza site.

Grading Scale

Your final grade will be assigned as a letter grade according to the following scale:

- A 90-100%
- B 80-89%

C	70-79%
D	60-69%
F	0-59%

Attendance Policy

Class attendance is strongly encouraged but not required.

Academic and Research Honesty/Integrity Statement

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review the [Student Code of Conduct](#) and the [Academic Honor Code](#), especially [Appendix A: Graduate Addendum to the Academic Honor Code](#).

Students are expected to perform research in an ethical and responsible manner. All Doctoral and Master's Thesis students are required to take the [Responsible Conduct of Research training](#), and it is expected that students abide by the principles taught in that training while performing research for this thesis course.

Allegations of scientific or scholarly misconduct are handled in accordance with the procedures outlined by the [Policy for Responding to Allegations of Scientific or Other Scholarly Misconduct](#).

Collaboration:

Plagiarism: In most cases I expect all code that you submit was written by you. All source code, images and write ups you provide should have been created by you alone.

What is allowed: Meeting with other students to discuss implementations; you should talk about solutions at the pseudo code level. Sharing snippets of code to solve specific (small) problems; in this case the shared code should be no more than ~5 lines. Searching the web for other solution outlines that you may draw on (but not copy directly); if you are inspired by a solution on the web, you MUST cite that code with comments in your code.

What is not allowed: Copying sections of code longer than 5 lines. Note that merely changing variable names does not suffice. Copying code from the web. Use of ideas from the web that are not cited in your comments/references.

You may review the following note on [Collaboration vs. Plagiarism](#).

Core IMPACTS

Not applicable.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Expectations of Advisors and Advisees

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The [Expectations of Advisors and Advisees](#) articulates some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.