

FCM 710: Architecture of Secure Operating Systems

Spring 2010

Instructor: Prof. Shamik Sengupta

Class time: Tuesday: 6.20pm – 8.20pm

Office Hrs: Tuesday: 5.00pm – 6.15pm or by appointment

Instructor's website: <http://jjcweb.jjay.cuny.edu/ssengupta/>

(Email: ssengupta@jjay.cuny.edu)

Course Description:

This course provides an introduction to the topics related to "Operating Systems" and its protection and security. An operating system can be thought of as an interface that acts as an intermediary between computer hardware and users. The principles and methodologies used in the design, implementation and administration of modern operating systems will be studied in detail. The vulnerabilities in these operating systems and proper counter-measures will be studied. Topics include concurrent execution, process and memory management, local and networked file systems, security models, access control mechanisms and security enhanced versions of current operating systems.

Reference Texts:

There is no single textbook for this course.

The instructor shall provide written notes and slides for many topics. Notes and slides will be posted either on the course website (<http://jjcweb.jjay.cuny.edu/ssengupta/>) or on the course's Blackboard site. References to current articles from journals, magazines and other websites may also be used.

Reference textbooks that can be used for this course:

- Modern Operating Systems, (3rd Edition), by Andrew S. Tanenbaum, Publisher: Prentice Hall, ISBN-10: 0136006639, ISBN-13: 9780136006633
- Operating Systems: Internals and Design Principles, (6th Edition), by William Stallings, Publisher: Prentice Hall, ISBN-10: 0136006329, ISBN-13: 9780136006329
- Operating System Concepts, (8th Edition), by Abraham Silberschatz, Peter B. Galvin, Greg Gagne, ISBN: 978-0-470-12872-5

However, the above list is not exhaustive and students may refer to any other operating systems reference books for this course.

Syllabus:

The following is the tentative course syllabus. This may change depending on time available, student and instructor expectations, student feedbacks as we progress in the semester.

- Operating system overview
- Process and memory management
- Concurrent execution models
- Protection and security models
- Bugs and reliability issues
- Case study of modern operating systems

This is a discussion-based class and would cover contemporary issues. Apart from learning the strengths and vulnerabilities of modern operating systems, the goal of the course is also to cover a broad array of research topics in operating systems, and to engage you in top-flight systems research. Research papers may be assigned as part of the reading materials and students are expected to read the papers before the class to gain understanding. Students in this class are expected to work on an operating system research project that should lead to project paper of publishable quality.

Student Assessment:

This is a tentative grading division. This may change later and will be updated.

- Project: ~ 30%
- Two Homework assignments: ~ 20%
- Mid-term exam : ~ 25%
- Final Exam: ~ 25%

FCM 710 Tentative schedule

Week No.	Date (Tuesday)	Milestones
1	2/2	Course Overview, Interactive discussion
2	2/9	
3	2/16	
4	2/23	Homework 1 assigned (Tentative)
5	3/2	Homework 1 submission due (Tentative)
6	3/9	
7	3/16	
8	3/23	Midterm Exam (Tentative)
9	3/30	Spring Break – No Class
10	4/6	
11	4/13	
12	4/20	Homework 2 assigned (Tentative)
13	4/27	Homework 2 submission due (Tentative)
14	5/4	Project due first day
15	5/11	Final Exam preview, Project due last day
16	5/18	Final Exam

Other Points:

1. Please use “FCM 710 <YOUR SUBJECT>” in the subject line in the emails.
2. All the assignments must be done individually.
3. Students should have access to a computer with Internet connection for assignment purpose.
4. Final project will focus on the operating systems/security issues in the current state of the art operating system. Novel research issues as the topic of the project will be more appreciated. For list of project topics, discuss with instructor.
5. A written report of the project is expected at the submission time along with any implementation code (if there is any).
6. Grades for the project will be based on criteria such as innovativeness, presentation/organization of project report, and completeness.