

CSCI 499: Security Systems

Spring 2012

Basic Information

Place and time: TBA

Instructor: Jelena Mirkovic

email: sunshine@isi.edu

phone: 310-448-9170

office: SAL 214/216

office hours: Friday 1-2 pm

Course homepage: <http://ccss.usc.edu/499/>

Prerequisites: CSCI 402 or CSCI 450 or permission of the instructor. This class is appropriate for undergraduate students with previous classwork in networking and/or operating systems. Students from non-systems/networking areas are welcome. Please contact the instructor if you wish to enroll and don't have the prerequisites.

Course Description

Computers and networking are crucial to many aspects of our daily lives: entertainment, business, personal communication, healthcare, transportation, utilities, etc. Security of such systems is thus of paramount importance for protecting our assets or even our lives. This course will give students an overview of systems security, its workings, and its role in protecting data and computing resources. At the end of the course, students should be able to

- Describe and assess a broad range of security problems and solutions
- Understand the fundamental mathematics and engineering underlying security systems
- Judge the suitability of security systems for various applications
- Know how to develop new security systems and features

In addition to lectures students will be engaged through a number of hands-on homework assignments and capture-the-flag (CTF) exercises, where they will apply the knowledge from the class in realistic security scenarios.

Textbooks and Course Materials

TBA

Grading

Grades will be calculated based on the following formula:

Class tasks	Percentage of the final grade
CTF exercises	20%
Homeworks (6-8)	20%

Participation	5%
Quizzes (6-8)	5%
Midterm exam	20%
Final exam	30%

CTF exercises will be done in class, on DeterLab, and will require a week of preparation. Homeworks will require 1-2 h of preparation and 1 h to complete and will be done on DeterLab. Quizzes will be administered as closed-book and online, and students will be allowed to retake them as many times as they desire. Midterm and final exam are in class and closed book.

Schedule by Week

Date	Topics covered	Slides	Reading/Links	Assignments
1/18	Field of security			
1/25	Cryptography			
2/1	Key management			
2/8	Authentication and identity management			
2/15	Authorization and policy			
2/22	Intrusions, firewalls, intrusion detection and response, intrusion prevention			
3/1	CTF exercise: Secure Data Access			
3/8	Midterm			
3/15	Denial of service			
3/22	Spring break			
3/29	CTF exercise: Secure Server			
4/5	Worms, botnets, phishing and spam			
4/12	Security and privacy in social networks			
4/19	Internet infrastructure security			
4/26	Health system security, vehicular networks security			
5/3	Final review			

Statement for Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:

<http://www.usc.edu/dept/publications/SCAMPUS/gov/>

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at:

<http://www.usc.edu/student-affairs/SJACS/>

Emergency Preparedness/Course Continuity in a Crisis

In case of a declared emergency if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies.