Course Syllabus for CMPSC 447: Software Security

Gang Tan
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Course description. This course explores the fundamental concepts and engineering processes of software development and testing to produce software that is designed for security. This course is intended as a senior-level course for computational majors such as computer science and computer engineering since it covers the exploitation of programs based on computer architecture, systems, and software concepts.

Prerequisites. CMPSC 443 (Introduction to Computer and Network Security). It is required that you have taken the prerequisite course.

Time and location. TTh 10:35–11:50am, Chambers Bldg 111.

Instructor. Gang Tan, Westgate W358, 814-8657364, gtan@psu.edu. Office hours: Weds 1:30-3pm or by appointment.
   TA: Yongzhe Huang, jk.aristode@gmail.com. Office hours: Tuesdays 2–3:30pm at Westgate W355.
   Learning assistant: Anish Prasad Paranjpe, app21@psu.edu. Office hours: Fridays 2–3:30pm at the table outside Westgate W204.

Course Website. A public website is at http://www.cse.psu.edu/~gxt29/teaching/cs447s19/. Slides, readings, and schedule are announced there. We also have a Canvas (canvas.psu.edu) website where you should submit homework and receive grades.

Textbook. No textbook is required.

Required Course Materials. Security fundamentals; Memory corruption vulnerabilities; Randomization; Safe programming techniques; Fuzzing; Static analysis; Reference monitors; Secure information flow; Privilege separation; Java security

Attendance. Attendance is expected. Students who have legitimate reasons for absence have to inform the instructor before the fact. Students are responsible for all materials presented in class whether present or not. Please refer to PSU’s attendance policy for clarification.

Readings. Readings will be announced on the public course website.

Assignments. You will periodically receive homework and project assignments that are to be turned in through Canvas. Assignments and their due dates will be announced in Canvas.

Late Homework and Missed Exams. Late Policy: Starting right after the required submission date of any homework or project or lab report, 10% of the grade will be deducted per day up to five days. NO points will be given to submissions more than five days late.
   Make up for missed exams will only be granted on a case-by-case basis.
   A documented condition which could affect this policy must be immediately brought to the attention of the instructor.
   There will be unannounced quizzes. The quizzes won’t be graded, but are used to record attendance.
Grading. Assignment 60%; Final exam 35%; Class attendance 5%.

Percent-grade to letter-grade conversion. 93–100% A; 90–92.9% A-; 87–89.9% B+; 83–86.9% B; 80–82.9% B-; 77–79.9% C+; 70–76.9% C; 60–69.9% D; <60% F

Collaboration Policy. You are expected to work alone (unless explicitly allowed in an assignment). Submission of identical or virtually-identical homework or code by two students, when it is clear that this is not a coincidence, will be treated as a violation of the university’s academic integrity policy. The same holds for materials found on the internet: you should not use them unless explicitly allowed.

Academic Integrity. The University defines academic integrity as the pursuit of scholarly activity in an open, honest and responsible manner. All students should act with personal integrity, respect other students’ dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their effort (refer to Senate Policy 49-20). Dishonesty of any kind will not be tolerated in this course. Dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Students who are found to be dishonest will receive academic sanctions and will be reported to the University’s Office of Student Conduct for possible further disciplinary sanctions (refer to Senate Policy G-9).

In addition, also refer to the CSE department’s academic-integrity policy.

Disability Access Statement. Penn State welcomes students with disabilities into the University’s educational programs. Every Penn State campus has an office for students with disabilities. The Office for Disability Services (ODS) Web site provides contact information for every Penn State campus: http://equity.psu.edu/ods/disability-coordinator. For further information, please visit the Office for Disability Services Web site: http://equity.psu.edu/ods.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: http://equity.psu.edu/ods/guidelines. If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

Counseling and Psychological Services Students who experience personal issues that interfere with their academic performance, social development or satisfaction at Penn State are encouraged to seek confidential assistance from Counseling and Psychological Services (CAPS) Center. They can be reached at (814) 863-0395. Some of the more common concerns they can help with include anxiety, depression, difficulties in relationships (friends, roommates, or family); sexual identity; lack of motivation or difficulty relaxing, concentrating or studying; eating disorders; sexual assault and sexual abuse recovery; and uncertainties about personal values and beliefs. Crisis intervention is available from Centre County CAN HELP at 1-800-643-5432, 24 hours a day, seven days a week.

Technology use The purpose of this course is to help students understand basic software security problems and counter measures. The knowledge should not in any way be used by students to exploit vulnerabilities inside PSU or outside. Please check out PSU’s policy on “Acceptable Use of University Information Resources” (https://policy.psu.edu/policies/ad96).

Feedback. The success of this course needs a mutual communication between course staff and students. We welcome your feedback related to the course, such as course materials we cover, teaching techniques, and difficulties in the assignments and exams. We need your input.