Department of Computer & Information Science

IUPUI

CSCI 59000 Security Engineering

Fall 2020

Tentative Syllabus

Instructor Information

Instructor: Arjan Durresi

Office: Online

Office hours: Tuesday, Thursday: 2:00-3:00 p.m. online, by appointment online.

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TA: Davinder Kaur

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Office: Online on zoom or email

Office hours: Tuesday and Thursday: 12 p.m. -1 p.m. and by appointments

Objective

This course has the following five general objectives:

1. Communication and Quantitative Skills
2. Critical Thinking
3. Integration & Application of Knowledge
4. Instinctual Depth, Breadth, and Adaptiveness
5. Values and Ethics

Most of these principles will be integrated into various parts of the course such as homework, exams, and projects.

Cyberspace has transformed the daily lives of people for the better. The rush to adopt cyberspace, however, has exposed its fragility and vulnerabilities: corporations, agencies, national infrastructure, and individuals have been victims of cyber-attacks. Therefore, major efforts are in progress are being made to the education to bolster education and training in cybersecurity. Moreover, this course is part of such efforts. The course covers the major areas of trustworthy computing systems such as security, reliability, privacy, and usability. The course will expose the students to the state of the art issues trustworthy computing and tools for security in real organizations. In the course, we will discuss the central concept of a security protocol, human-computer interface issues, access controls, cryptology, and distributed system issues. We will include our research results in the field of trust management.
Furthermore, we will illustrate the trustworthiness concepts in some important applications, such as military communications, medical record systems, cash machines, mobile phones, and social networks. These are used to introduce more of the advanced technologies and concepts. It also considers information security from the viewpoint of some different interest groups, such as companies, consumers, criminals, police, and spies. Finally, we will discuss organizational and policy issues: how computer security interacts with law, with evidence, and with corporate politics; how we can gain confidence that a system will perform as intended; and how the whole business of security engineering can best be managed.

More specifically, the course specific topics cover the architectural aspects of modern trust and system security. The course builds on students' prerequisite knowledge from studies in computer security, operating systems and computer architecture. Material covered in the class will include some concepts from various textbooks and research papers. Please pay attention to the class discussion and lecture. Some topics to be covered with the corresponding tentative schedule are:

Date	Topic
8/28/20	Course overview
9/04/20	Trust and Trust Management
9/11/20	Usability and Psychology
9/18/20	Protocols
9/25/20	Access Control
10/02/20	Cryptography

10/09/20	Distributed Systems
10/16/20	Economics
10/23/20	Multilateral Security
10/30/20	Monitoring and Metering
11/06/20	Managing and Development of Secure Systems
11/13/20	
11/20/20	Project Deadline – Presentation

Besides the technical content, the instructor will cover other aspects of research activities, such as how to select a research topic, how to write research papers, and how to present research results.

Textbook

No textbook is required.

Research Papers

Students will read and review several research papers, which will cover important topics in Security and trust. The reports based on the review of research papers are part of homework.

Presentations

Students will present reviews of research papers.

Project

An important component of the course will be the project. The projects can be individual or in teams, after the instructor approval. The topics of the projects will be approved by the instructor. The report of the project will be in the form of a research paper.

Online Communication

The canvas will be used in this class for online communications, electronic handouts, grade information, etc. You will need your IUPUI network id to access Canvas. When you officially register for the course, you will have access to the class material automatically.

Grading Information

There will be two exams in this class. There will also be some homework (including a report of review papers). Students will also accomplish a project and write a project report in the form of a research paper.

The breakdown of the percentages on the final grade is as follows:

Activity in the class, involvement in class discussion	5%
Project	35%
Exams	60%

The grades will be kept as numerical values throughout the semester, and the instructor will assign a letter grade for the class at the very end based on the total weighted course score as described above. The letter grade assignment will be curved and will be based on the ranked values of the total weighted scores computed for the course. The letter grade thresholds will be determined based on the distribution of these total course scores.

Academic Honesty and Student Responsibilities

Students are responsible for getting their work done on time, working independently, attending class, checking canvas and email for new announcements and assignments. They are responsible not only for the reading material from the textbook and research papers but also all the material covered in lectures, including material not covered in textbook or research papers. Your work in this class must be your own and cheating is not tolerated. The Academic Integrity of IUPUI standard will be followed.

Students will be taken at their word when they communicate the reason they must miss a class. However, a student will be subject to discipline under the Student Code of Rights, Responsibilities, and Conduct if they are not truthful about the reason for their absence.

If a student does not abide by this policy then, for the first violation, he/she will receive zero points for the component of the course on which academic misconduct occurred and will be reported to the Department Chairperson. If the violation is not related to a specific assignment or exam, the course instructor reserves the right to impose the zero-point penalty on any component of the course.

For a second violation of academic integrity (occurring anywhere in the graduate or undergraduate curriculum, in the same or a different semester, in the same or a different course), the student will receive a failing grade for the course where the second violation occurred, as enforced by the Department Chair and the School of Science Dean's Office, and, also, an official reporting process will be initiated by the Department Chair as per IUPUI's Student Conduct Policies: http://studentaffairs.iupui.edu/student-rights/student-code/.

For a third violation, the department will initiate dismissal request from the program in which the the student is enrolled.

In all cases of academic integrity violation, the involved student will be notified in writing at the time the offense is observed and acknowledge the receipt of such notice in writing.

This is the minimal policy and the department reserves the right to impose more severe penalties for the first and second offense of academic misconduct.

The student will have opportunities to file appeals in the department, the school, and the university levels, to contest the academic dishonesty finding and the imposed penalty.

At the department level, any appeal will be made to the department's graduate or undergraduate committees respectively, depending on whether the student is a graduate or an undergraduate student. The graduate or undergraduate committee chair will substitute any committee members involved in the penalty imposition process with other faculty members with no conflicts of interest before processing the appeal. If desired, a student can pursue a further appeal to the School of Science Appeals Committee. Finally, the student can also submit an appeal to the IUPUI Appeals Committee.

Adaptive Educational Services

Every attempt will be made to accommodate students with disabilities (e.g., mental health, learning, chronic health, physical, hearing, vision, neurological, etc.). You must have established your eligibility for support services through the Adaptive Educational Services office that serves students with disabilities. Note that the services are confidential, may take time to put into place and are not retroactive; Captions and alternate media for print materials may take three or more weeks to get produced. Please contact AES office as soon as possible if accommodations are needed, AES is located in room 100 Taylor Hall, 317-274-3241.