



# **Problems in National Information Security**

**CNS 597/397**

**Fall 2018**

**Dr. Filipo Sharevski**

## **1. COURSE INFORMATION**

This course engages students in national cybersecurity/information systems security problems. Students will learn how to apply research techniques, think clearly about these issues, formulate and analyze potential solutions, and communicate their results. Working in small groups under the mentorship of technical clients from government and industry, each student will formulate, carry out, and present original research on current cybersecurity/information assurance problems of interest to the nation. Support for this course is provided by the National Security Agency (NSA). As part of the award, this course will be run in a synchronized distance fashion, coordinating some activities with our partner schools and our technical clients.

### **1.1. Offering**

This course is offered as an open elective for both undergraduate and graduate students.

### **1.2. Prerequisites**

No prerequisites. Students may come from cybersecurity, network engineering and security, computer science, computer engineering, information technology, or any related technical field (e.g., electrical engineering, information systems, math). Each student is expected to bring significant expertise, interest, and experience in at least one relevant technical area. Each student is expected to bring significant expertise, interest, and experience in at least one relevant technical area.

## **2. INSTRUCTOR INFORMATION**

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Office Hours: by appointment

## **3. COURSE REQUIREMENTS**

### **3.1. Required Work**

Working in teams, each student must complete a research project on a focused topic in cybersecurity. The project must aim to accomplish new, significant results (survey papers are not acceptable). Each student must communicate findings in an oral presentation to the class and in a written report in the format of a computing discipline technical report (about 10–20 pages). Every aspect of the project (including proposals, reports, and presentations) is intended to match the process that professional computer science researchers follow in carrying out original research.

Project topics come from lists of problems supplied by government or industrial partners. The main deliverables are a written technical report, a poster, and an oral presentation describing the team's new and significant findings (similar in form and length to those from technical research conferences such as USENIX Security). Each student is expected to participate actively in class.

### 3.2. Expected Outcomes

By the end of the course, students will be expected to:

- (1) be familiar with important current cybersecurity challenges,
- (2) think clearly about cybersecurity issues,
- (3) formulate and analyze potential solutions,
- (4) work cooperatively in groups, and
- (5) communicate results effectively in a technical report and oral presentation.

### 3.3. Principles

This course rests in part on the following principles.

- (1) Collaboration—including among industry, government, and different universities - can facilitate learning and the advancement of science and technology.
- (2) All course activities and deliverables model those of professional cybersecurity researchers.
- (3) Excellent research bridges both theory and practice.
- (4) All participants in the course are expected to conduct themselves in their speech, behaviors, and computer interactions with integrity and with respect for others.
- (5) A connected research network enables researchers of all experience and expertise levels to find solutions to real-world classified and unclassified cybersecurity problems.

### 3.4. Assignments and Grading

Assignments are posted to the D2L. You must follow the posted submission instructions, including file-naming conventions, the general rule for which is on INSuRE Hub (an external platform for research collaboration where you have to upload your assignments too, so the partners can review them). Format and content specifications (in the form of a rubric and/or template) will be provided for via D2L. Grades will be assigned as measures of performance on required activities. Late work will not be accepted.

Weighting of Assignments	Percentage
Project bid	5%
Project proposal	10%
Progress report	20%
Progress report presentation	15%
Final report	40%
Final report presentation and poster	10%
<b>Total</b>	<b>100%</b>

The project will be evaluated on the basis of scientific merit, effective presentation, and appropriateness to the assignment.

### Scale Applied to Weighted Total Score:

Weighted Total Score	Grade
90 – 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
0 – 59%	F
Extenuating circumstances only	FX, IN

### The following policies apply to final grades:

- Weightings for the assessment mechanisms subject to change, with notice.
- Weighted percentages for the final grade will NOT be rounded up. For example, 89.8% is a "B". However, the instructor reserves the right to grade on a curve at their discretion.

### Confidential Evaluation of Group Members

Each member must evaluate the performance and contribution of each group member (including yourself) to the project. What did each person do and how well did they do his or her task? How well did the group function as a team? This evaluation will be read only by the instructors.

### Course Schedule

Weighting of Assignments	Due Date 11:59pm
Project bid	September 14
Project proposal	October 5
Progress report	November 2
Progress report presentation	November 9
Final report	December 7
Final report presentation and poster	December 14

### Submission of Work

Work is defined as the student's submitted work in response to an assignment, project, paper, or examination. All work must be submitted electronically via D2L, unless otherwise specified or approved by the instructor. In the event of D2L outages, homework and projects may be submitted by email to the instructor. Note that D2L Learn does not allow students to “retract” a submission. However, this instructor allows multiple submissions to achieve the same purpose. It is the course policy that only the LAST submission before the assignment deadline by a given student will be graded.

### Deadlines and Penalties for Late Work

Late work will not be accepted. Late work affects others. Peer review is an important aspect of the course, and peer review requires coordinating schedules, including among different universities. Some projects may depend on other projects. To complete the project by the end of the term, it is important to complete each milestone on time. Professional researchers often have

deadlines to meet. Should you encounter an unanticipated or uncontrollable event that may prevent you from meeting a deadline, contact the instructor immediately to request an extension. Extensions are not automatic or guaranteed.

### **Quality of Work Expectations**

One of the program outcomes for this degree is to communicate effectively with professional audiences of various types. This requires that one take personal pride in their work, and be held accountable for professional quality work. To this end, the following quality expectations are established for this course:

- Unless otherwise specified, homework and applied project assignments should be formatted as if they are being presented to non-technical business managers.
- Organization, conciseness, formatting, and style count -- make an impression!
- Unless otherwise specified, research papers must be formatted in one of the following two academic styles:
  - APA (recommended)
  - IEEE (accepted)
- For all out-of-class work, organization, presentation style, grammar, and spelling will be weighted into the score. Spelling will be evaluated using the Microsoft Word Standard United States dictionary.
- Points will be lost for poorly organized or unprofessional work. This includes spelling and grammar errors, poor word choice, and poor sentence structure.
- Points will be lost for not following instructions.
- Students who have writing difficulties or deficiencies, and students for whom English is a foreign language should consider using the services provided for free through the DePaul Writing Based Learning Center.

### **Feedback on Submitted Work**

For purposes of this section, feedback refers to the scored assessment of learning on any given assignment, examination, project or paper. Scores are summed, categorized, and weighted to determine the final course grade. The following policies apply to scores:

- Feedback will be provided regularly by your instructor – as quickly as possible. Every instructor has multiple responsibilities beyond his/her courses. And each instructor has a unique way of providing feedback. If you believe you are not getting enough feedback, you are encouraged to contact your instructor and ask for more.
- The instructor will make every effort to grade assignments no later than one calendar weeks after the assignment due date.

## **4. COURSE RESOURCES**

### **4.1. Required Books and Materials**

No course materials are required for this section.

## **4.2. INSURE Hub**

This course uses INSURE Hub (<https://app.insurehub.org/>), an online collaboration and data management platform, as a medium for exchanging materials with other institutions and problem sponsors. Class assignments, deliverables, and other information you wish to make available to your technical director (TD) should be uploaded to INSURE Hub.

INSURE Hub also holds resources for preparing deliverables; you will be directed to these when they are needed. Close to the start of the quarter, you will receive an email to create an account on the INSURE Hub; if you haven't received an email about registration, please check your spam folders; if still the email is missing, email me and I will coordinate with the INSURE Hub administrators. Once you get the email, follow the instruction to create your account. Familiarize yourself with the platform and make sure you read all the student resources needed for your active collaboration and assignment submission.

## **5. COURSE POLICIES**

### **5.1. Attendance Expectations**

Students are expected to attend all scheduled class meetings. Students are expected to keep pace with the announced schedule for the course. This includes participation in online course discussions that are factored into the final course grade.

Students should report planned absences (e.g., interviews, employment site visits, and extracurricular activities) to the instructor before class meets. Email messages should suffice. Students are still responsible for discovery of missed content, assignments, and announcements.

The university defines an "extended absence" as five calendar days or longer (meaning independent of the university schedule, breaks, or holidays). In the event of such an extended absence -- including online course absences -- the student is responsible to promptly contact the instructor. The student to also report the extended absence to the Dean of Students and receive advice as to how to proceed. In such cases, the Dean of Students will validate the absence and notify the instructor of recommended accommodations, if any. Upon return from the extended absence, excused or unexcused, the student is solely responsible for discovery of any course content, assignments, deadlines, and announcements that were missed, and arranging to makeup that work on a reasonable timetable.

### **5.2. In the Event of Campus Emergencies**

Students are encouraged to sign up for email and text message notifications of university emergencies.

### **5.3. In the Event of Disruptions to the University Calendar**

If classes are suspended, students and instructors are not to report to the classroom. However, any assignments that are due should be submitted electronically when possible. Students should monitor e-mail, pre-designated Web sites and Blackboard for assignments or direction from the faculty concerning instruction or assignments.

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or

other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course D2L website or can be obtained by contacting the instructor via email or phone

#### **5.4. Student and Instructor Behavior**

The instructor and students will treat one another with professional courtesy and respect as part of any online messages and discussions.

#### **5.5. Use of Computers and Mobile Devices During Class Meetings**

During class, please silence your mobile devices (cellphones, smart phones, tablets, netbooks, and laptop computers) as a courtesy to the instructor and your fellow students. During exams, all mobile devices are to be powered off unless otherwise pre-arranged with the instructor.

#### **5.6. Class Participation Expectation**

Class participation may be assessed as a learning component. Participation is an important activity based on the underlying belief that students learn from one another.

#### **5.7. Academic Integrity and Honesty**

You are expected to review and adhere to the DePaul University Academic Integrity and Dishonesty: <http://academicintegrity.depaul.edu/> .

#### **5.8. Course Policy on Academic Dishonesty**

Academic dishonesty discredits the majority of students who are honest, and the value of their DePaul degrees. Cheating, or helping another student to cheat, are considered equal cases of academic dishonesty and will be dealt with as described below.

- Giving another student access to your computer/network account, or negligently permitting another student to access your computer constitutes cheating on your part if that other student copies any files that become implicated in a cheating case.
- Any form of cheating on an examination will result in both a zero score for the exam, and may also result in an "F" grade for the course at the instructor's discretion. Additionally, the case will be forwarded to the university's Office of the Dean Students for appropriate and additional disciplinary action.
- Any form of cheating on a homework or applied project will result in both a zero score for the assignment, and a one-letter grade penalty for the course. Also, the case will be forwarded to the university's Office of the Dean of Students for appropriate and additional disciplinary action.
- Cheating on a research paper is a particularly heinous form of academic dishonesty for a graduate student. Graduate students are expected to know when and how to properly cite the published and unpublished intellectual property of other scholars. They are expected to understand that paraphrasing intellectual property is just as bad as directly copying or editing another's work.
- The instructor reserves the right to submit any and all research papers to DePaul's plagiarism detection software service and act upon any negative results. Any form of cheating or plagiarism on a research paper will result in a "F" grade for the

course, and the case will be forwarded to appropriate university offices for disciplinary action, up to and including expulsion from the program and university.

### **5.9. The Incomplete Grade (“IN”)**

The grade of "Incomplete" ("IN") will only be given for medical emergencies and other dire unexpected circumstances. Failure to complete work on time is not a valid reason for receiving an incomplete. Incompletes will not be given to cover up failure in the course, or failure to keep up with the course pace or schedule.

### **5.10. Students with Disabling Conditions**

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: [csd@depaul.edu](mailto:csd@depaul.edu). Lewis Center 1420, 25 East Jackson Blvd. Phone number: (312)362-8002