CIS 4219 / 6218: HUMAN ASPECTS OF CYBERSECURITY

Section 001 – CRN 23007 – 3 Credits – Fall 2021
Prof. Giovanni Luca Ciampaglia
College of Engineering, Department of Computer Science & Engineering.

COURSE SYLLABUS

CLASSES: Mondays and Wednesdays 15:30–16:45 am

LOCATION: EDU 347 or Microsoft Teams (see X Course Delivery for more information)

EMAIL: glc3@mail.usf.edu

OFFICE HOURS: Tuesdays and Thursdays 10:30–12:00 pm or by appointment (doodle.com/mm/giovannilucaci-ampaglia414/book-a-time) on Microsoft Teams

TEACHING ASSISTANTS (check Canvas for TA office hours):
- Ravi Sharma <ravis@usf.edu>

I.   Welcome!

Welcome to Human Aspects of Cybersecurity. This course covers an emerging field of cybersecurity, one that is fundamental to securing cyberspace. I have designed this course to be thought provoking, a rigorous course that confronts your assumptions about what it takes to secure cyberspace. During the term you will be challenged to explore why humans do the things that they do online. If a person will not leave the front door to their house unlocked, then what it is about their psychological and sociological mindset that enables them to be comfortable with leaving their devices or data unprotected?

II.   University Course Description

This course will study the human aspects of cybersecurity and cover such topics as: identity management, social engineering, societal behaviors, privacy and security, and individual awareness and understanding of cybersecurity.

III.   Course Purpose

Humans play an important, but often overlooked, role in cybersecurity. No matter how advanced a computing system is, if the human operator does not use it properly, then the system (and, sometimes, the human too!) is vulnerable to attacks. This course is going to explore what roles individuals, employees, employers, and creators of digital systems play in protecting systems, along with personal data and privacy of their users; how does human psychology and sociology fit into cybersecurity; how can we "engineer" more resilient users to ensure a safe and secure cyberspace; and how we can implement threat mitigation that is influenced by the study of human behavior as it relates to cybersecurity.

IV.   Course Prerequisites

For CIS 4219: CIS 3363 minimum grade: C−
For CIS 6218: None.

V.   Course Goals

At the successful completion of the course, students will:
- Have an appreciation of the complex role that humans play in cybersecurity,
- Know how to draft policies and procedures that utilize knowledge of human behavior to increase the security of organizational computer systems, and
- Understand why the human aspect of cybersecurity is one of the most challenging aspects of cybersecurity that an organization will face.

VI.   Course Objectives

At the successful completion of this course, students will be able to:

1. Assess ethical dilemmas that occur in organizations in the context of cybersecurity and develop constructive resolutions based upon application of ethical theories, principles, and models.
2. Design effective organizational cybersecurity standards and policies.
3. Analyze the psychological and cultural aspects of cybersecurity.
4. Analyze the challenges of managing the human aspects of cybersecurity.
5. Analyze personal privacy issues related to various personal and business-related cybersecurity scenarios.
6. Analyze key issues related to hacker culture and their potential impact on individual organizations and society as a whole.

VII. Student Learning Outcomes
At the successful completion of this course, students will be able to:
1. Compare and contrast the differences between identification, authentication, and access authorization of people and devices.
2. Explain the importance of audit trails and logging in identification and authentication.
3. Summarize the types of social engineering attacks, psychology of social engineering attacks, and misleading users.
4. Demonstrate the ability to identify types of social engineering attacks.
5. Design and implement approaches for detection and mitigation of social engineering attacks.
6. Describe the importance of cyber hygiene, cybersecurity user education, as well as cyber vulnerabilities and threats awareness.
7. Describe the major topics within Security Education, Training, and Awareness (SETA) programs.
8. Summarize the importance of SETA as countermeasures.
9. Argue the importance of risk perception and communication in the context of mental models of cybersecurity and privacy.
10. Compare and contrast various theories of privacy from social psychology and social science.
11. Describe the concepts of privacy tradeoffs and risks in the social context, control and awareness of data consent, personal information monitoring, regulatory protections and concerns on maintaining social privacy.
12. Summarize the importance of social media privacy and security.
13. Justify the importance of protection of Sensitive Personal Data (SPD) and Personally Identifiable Information (PII).
14. Justify the importance of regulations governing the collection, use and distribution of SPD, and possibilities for inference of SPD.
15. Describe the concepts of personal tracking and digital footprint, while understanding the invasiveness of such tools in the context of privacy.

VIII. Required Texts and/or Readings and Course Materials
No required texts; all reading materials will be provided on Canvas for the students.

IX. Supplementary (Optional) Texts and Materials
All supplemental materials will be provided on Canvas for the students.

X. Course Delivery
I will deliver this class, as scheduled, in-person and will provide a flexible component for students who are asked to isolate or quarantine, or are unable to attend a class in-person for an extended period of time.

Please note: All students may be required to attend in-person classes, especially to complete assessments and examinations.

For students planning to attend in-person, I will teach in-person classes in the assigned classroom and on the scheduled day and time. For students who are unable to attend a class in-person, I will provide course content in a flexible format to support the student's academic progression and success. Please contact me directly if you have questions. In addition, I will post details on how a student can join the class remotely in Canvas.

XI. Canvas

We will use Canvas (usflearn.instructure.com/courses/1611714) to keep track of grades and all submissions. Any announcement posted on Canvas will be assumed to be known to students. It is your responsibility to check it regularly.

XII. Grades

Your final course grade is a weighted average of the grades earned on all graded material. The weights are:

Assessment	Weight
Attendance	10%
Assignments	25%
Group Presentation (CIS 4219) / Term Paper (CIS 6218)	15%
Quizzes	15%
Exams	35%

Attendance – 10%
The student is expected to fully participate in the class and to contribute to all its aspects. For this reason, attendance is required for this course. See XVI Attendance Policy for more information on excusable absences.

Assignments – 25%
You will have numerous assignments throughout the semester, both in-class and out-of-class assignments will be given.

Group Project – 15% (CIS 4219 only)
Each student will be expected to present on a topic as part of a group presentation. See XIV Grading Policies below for more information on the grading of group projects.

Term Paper – 15% (CIS 6218 only)
Each graduate student will complete and individual project or paper assignment and present it in front of the class. Please come talk to me for more information.

Quizzes – 15%
Throughout the semester there will be several quizzes to help you gauge your learning of the material. See the course schedule below. I also reserve the right to administer unannounced in-class quizzes.

Exams – 35%
There will be two (2) exams in this class, one midterm and a final. See the course schedule for the dates.

XIII. Standard University Policies

USF has a set of central policies related to COVID-19, student recording class sessions, academic integrity and grievances, student accessibility services, academic disruption, religious observances, academic continuity, food insecurity, and sexual harassment that apply to all courses at USF. Be sure to review these online at: www.usf.edu/provost/faculty/core-syllabus-policy-statements.aspx

XIV. Grading Policies

Grading Scale: No curving will be applied to any grade. Final grades will be on the scale below.

94–100	A
90–93	A−
87–89	B+
84–86	B
80–83	B−
77–79	C+
74–76	C
70–73	C−
67–69	D+
64–66	D

60–63	D−
0–59	F

Final Grades: There is no final rounding up nor bonus points: a grade of 89.99 is 89, not 90.

Homework Grades: Assignments completed late will be assessed a penalty of 20% for each day past the due date. At the beginning of the semester each student has three (3) extension tokens each equivalent to a 24h extension on the due date of a homework assignment. To use a token, please contact the TA or the instructor. No reasons need to be provided. Tokens cannot be used on the group project, term paper, quizzes, exams, or attendance.

Exam Grades: The exams are all mandatory and will take place during regular class hours. If you miss an exam, independent of reason, you will get an automatic 'F' for that particular exam. No make-up exams are offered for the class.

In-class Quiz Grades: Quizzes are taken online at a specific time and no make-up quizzes are offered for the class. Any missed quizzes will count zero (0) points for the final quizzes grade.

No Extra Credit Policy: There are no extra credit activities for this class.

Group Work Policy (CIS 4219 only): Everyone must take part in a group project. All members of a group will receive the same score; that is, the project is assessed, and everyone receives this score. However, that number is only 75% of your grade for this project. The final 25% is individual and refers to your team-work. Every person in the group will provide the instructor with a suggested grade for every other member of the group, and the instructor will assign a grade that is informed by those suggestions. The grading criteria are the same as the group project. Once formed, groups cannot be altered or switched, except for reasons of extended absence due to medical reasons.

Regrade policy: If you believe an error has been made in the grading of your work, you may resubmit it for a regrade — include a detailed explanation of which problems you think we marked incorrectly and why. Please understand that, because we will examine your entire submission in detail, your grade can go up or down as a result of a regrade request.

XV. Additional Policies
Email / Canvas: Questions by email or on Canvas will be responded usually in 48 hours during weekdays. If you write us during the weekend or a holiday, we may take longer to get back to you.

Class Recordings: In this class, software will be used to record live class lectures and discussions. As a student in this class, if you take part in live class discussions then your voice may be recorded.

XVI. Attendance Policy
We will be taking attendance and it will be part of your final grade. See XII Grades for more information on grading weights. In this course, *only* the following absences are excusable:
• Documented illness;
• Deaths in the immediate family and other documented crises;
• Call to active military duty;
• Court-imposed legal obligations (like jury duty and subpoenas);
• Religious observance (you have to provide me with a list within the first 3 weeks of classes);
• Special requirements of other courses in which the student is currently enrolled (like field trips or academic conferences);
• Severe weather conditions.
Absences due to causes of any other nature are not excusable. For an absence from the above list to be "excused", proper documentation must be provided, and if the absence is known in advance by the student then the student must inform the instructor in advance. Failure to do so may result in refusal of your request.

I will allow two (2) unexcused absences before I start deducting points from your "Attendance" grade.

XVII. Academic Integrity
The principles of academic honesty and professional ethics will be *vigorously enforced* in this course, following the USF System Regulation on Academic Integrity of Students (www.usf.edu/ethics/policies/).

This includes the usual standards on *acknowledgment* of help, contributions and joint work. *Any code or other assignment you turn in for grading and credit must be your individual work.* If we have group projects with different rules, they will be clearly announced. Even if you work with a study group (which is encouraged), *the work you turn in must be exclusively your own. If you turn in work done together with, or with the assistance of, anyone else other than the instructors, this is an instance of cheating*.

The USF Policy on Academic Integrity specifies that students may not use websites that enable cheating, such as by uploading or downloading material for this purpose. This does apply specifically to Chegg.com and CourseHero.com – almost any use of these websites (including uploading proprietary materials) constitutes a violation of the academic integrity policy.

Cases of academic misconduct (including cheating, fabrication, plagiarism, interference, or facilitating academic dishonesty) will be reported to the Dean of Students. *The typical consequence will be an automatic F grade in the course*.

Your submission of work to be graded in this class implies acknowledgment of this policy. If you need clarification or have any questions, please see the instructor during office hours.

XVIII. Course Schedule (Mod: Module, Qz: Quiz, Hw: Homework)
The following is the tentative schedule for this course and it is subject to change. For a listing of assignments, please see the "Assignments" or "Calendar" section of Canvas. That being said, I will try my best to keep to it. If there are any changes to this schedule, they will be reflected on Canvas.

Wk	Class	Topic	Class	Topic	Mod	Qz	Hw	Due by class
1	Mon, Aug 23	Course intro; economic decision making basics	Wed, Aug 25	Economic decision making basics (cont.)	2	☐	☐	
2	Mon, Aug 30	Decision making in cybersecurity	Wed, Sep 1	Decision making in cybersecurity (cont.)	2	☐	☑	Simulation: productivity and security (due Wed)
3	Mon, Sep 6	Labor day; no classes	Wed, Sep 8	Heuristics in cybersecurity decision making	3	☑	☐	
4	Mon, Sep 13	Biases in cybersecurity decision making	Wed, Sep 15	Outcomes of bounded rationality	3&4	☐	☑	Assignment on Module 2 (due Wed)
5	Mon, Sep 20	Outcomes of bounded rationality (cont.)	Wed, Sep 22	Signal detection theory in cybersecurity settings	4&5	☐	☐	
6	Mon, Sep 27	Signal detection theory in cybersecurity settings (cont.)	Wed, Sep 29	User mental models of cybersecurity threats	5&6	☑	☑	Simulation: signal to noise (due Wed)
7	Mon, Oct 4	User mental models of cybersecurity threats (cont.)	Wed, Oct 6	MIDTERM EXAM	6	☐	☐	
8	Mon, Oct 11	Social engineering: types of attacks	Wed, Oct 13	Social engineering: psychology of social engineering	7	☐	☐	Project / Paper Proposals (due Wed)
9	Mon, Oct 18	Game theory and exploitation: types of games	Wed, Oct 20	Game theory and exploitation: human behavior	8	☑	☐	
10	Mon, Oct 25	Information search in cybersecurity settings	Wed, Oct 27	Information search in cybersecurity settings	9	☐	☑	Simulation: attack and defense (due Wed)

Wk	Class	Topic	Class	Topic	Mod	Qz	Hw	Due by class
11	Mon, Nov 1	Interaction design for cyber-security applications	Wed, Nov 3	Interaction design for cyber-security applications	10	☐	☐	
12	Mon, Nov 8	Cognitive engineering	Wed, Nov 10	Cognitive engineering	11	☐	☑	Simulation: unint. con-sequences (due Wed)
13	Mon, Nov 15	Social cybersecurity	Wed, Nov 17	Social cybersecurity	12	☐	☐	
14	Mon, Nov 22	Project presentations	Wed, Nov 24	Project presentations		☐	☐	Presentations (due Mon)
15	Mon, Nov 29	Project presentations	Wed, Dec 1	Project presentations		☐	☐	Term paper (CIS 6218 only, due Wed)
16		Wed, Dec 8, 12:30–2:30 p.m.		FINAL EXAM		☐	☐	

XIX. Important Dates

Event	Date
Drop/Add Deadline	Friday, August 27, 2021
Labor Day Holiday	Monday, September 6, 2021
Midterm Exam*	Wednesday, October 6, 2021
Last Day to Withdraw	Friday, October 29, 2021
Veteran's Day Holiday	Thursday, November 11, 2021
Thanksgiving Holiday	Thursday, November 25 & 26, 2021
Final Exam*	Wednesday, December 8, 2021

* These dates and all assignments dates are tentative, and can be changed at the discretion of the professor.

XX. The Last Word

I am here to help you do well in this course. If you need any help on the material or assignments, please come to office hours or email me before you get behind. If you have any other problems that interfere with your academic work, see me as soon as possible so we can look for a solution.