



ITP-125: From Hackers to CEOs: An Introduction to Information Security

Units: 2

Fall 2024

Day/Time: Wednesday 10am–11:50am

Location: MRF 229

Instructor: Jonathan Holtmann

Office: N/A

Office Hours/Open Lab:

TBD

Contact Info: holtmann@usc.edu

Learning Assistant(s):

• TBD

Digital Forensics & Cyber Security

Program Open Lab Hours:

• TBD

IT Help: Viterbi IT

Hours of Service:

Monday – Friday, 8:30 a.m. – 5:00 p.m.

Contact Info: DRB 205 (213) 740-0517

engrhelp@usc.edu

Piazza Enrollment:

TBD

Course Description

This course is designed to be an introductory course in information and computer security. This course starts with an analysis of threats to information integrity. Students will then receive an introduction to security mechanisms and policies. Students will learn how security infrastructure will integrate with the rest of the business and IT infrastructure through hands-on projects.

This is the gateway course for the Digital Forensics and Cyber Security Minors and Specializations at USC. As a result, this is a survey course where we will touch briefly on many different topics in the information security realm.

Catalogue Description

Introductory course in computer security. Fundamentals of information security management. Threats to information integrity. Ethical hacking concerns and practice. Policies and Procedures.

Learning Objectives

Upon completing this course, students will:

1. Understand the fundamentals of information security
2. Learn the basics of securing a workstation
3. Understand basic networking and security technologies
4. Understand the relationship between security and management
5. Have the motivation to learn and improve their awareness and understanding of computers and security

Prerequisite(s): None

Course Notes

The course is letter graded, with all materials available on Blackboard (blackboard.usc.edu). Labs will be conducted in the classroom (RRB101) during assigned class time or on your own time outside the classroom.

Technological Proficiency and Hardware/Software Required

It is assumed that the student has baseline technical knowledge (basic computer usage, basic internet usage, etc). For any upper-division course (300-level and above), it is assumed that you have refined your technical abilities in ITP 125, including basic Python scripting.

Description and Assessment of Assignments

The assignments will be a combination of in-class and out-of-class laboratory exercises. They will typically involve some form of procedural work (we will provide instructions), with some reflection on the work performed, including researching processes and procedures performed. All laboratory exercises will be graded on a point scale, typically between 10 and 20 points.

Grading Breakdown

Assignment	% of grade
Lab Assignments and News	45
Participation/Professionalism	5
Midterm Exam	15
Final Exam	20
Final Project	15
TOTAL	100

Grading Scale

The following shows the grading scale to be used to determine the letter grade.

93% and above	A
90% - 92%	A-
87% - 89%	B+
83% - 86%	B
80% - 82%	B-
77% - 79%	C+
73% - 76%	C
70% - 72%	C-
67% - 69%	D+
63% - 66%	D
60% - 62%	D-
59% and below	F

Grading Policies

The lab assistants, graders, and instructors will do their best to return assignments graded to students within one week of the submission. Certain assignments that are longer in length, including exams, and final projects, may require more time.

The grading rubric is posted. There is no curve, and grades are based on performance in the class. While we understand the importance of grades and maintaining a high GPA, we cannot hand out high marks without justified performance in class. Do not rely upon an expectation of a guaranteed minimum final grade in this class, regardless of its impact on your overall GPA, financial situation, familial situation, or the fate of the galaxy.

The instructor is the ultimate authority over any grade for any assignment, exam, or class.

University policy states that no extra credit may be afforded to individual students without the same opportunity made available to everyone in the class. Should there be extra credit in the

class, it will be made available to the entire class. Do not ask the instructor for additional extra credit.

Grades will be posted on Blackboard, and it is your responsibility to ensure that the grades online are accurate and to follow your progress in the class.

Assignment Policies

The labs will be posted on Blackboard under the “Assignments” or “Labs” section. Each lab will include instructions, a due date, and a link for electronic submission. Labs must be submitted using this link. Do not email your assignments to the instructor, lab assistants, or graders. TurnItIn may be utilized for some assignments, and you must ensure you have fully submitted the assignment (usually a two-step process).

Unless otherwise noted, all lab assignments are due at the beginning of class the next class period unless otherwise modified by Blackboard announcement and/or email from the instructor and/or Lab Assistants. Some assignments (typically longer) will have a due date of 11:59:59 PM on the Friday or Sunday of the following week. Do not expect a timely response from the lab assistants, graders, or instructors if emailed after normal business hours, particularly when the assignment is due.

If you join the class after the semester has started, you will have two weeks from the date of enrollment to complete all assignments due before you joined the class unless a written extension is granted from the instructor, typically via email.

It is your responsibility to submit your assignments on or before the due date and verify it has been successfully submitted. Assignments turned in up to 24 hours late will have 25% of the total points deducted from the graded score. Assignments between 24 and 48 hours late will have 50% of the total points deducted from the graded score. After two days, submissions will not be accepted, and you will receive no credit for the assignment.

The lab assistants and graders are not authorized to grant an extension on any assignment. Any extensions must be requested of the instructor in writing and confirmed in writing. If you ask for an extension on the day the assignment is due without expressing an emergency, such as being kidnapped and taken to Mexico, it will probably not be granted.

Certain assignments will require a paper submission, and you may be asked to submit them to the main ITP office. There have been previous allegations of student rudeness to the ITP Staff. If the staff complains about you being rude, you will have 25% automatically deducted from your assignment. Don't be rude.

The instructor and lab assistants reserve the right not to answer certain questions about the lab assignment. This is normally due to the nature of the question being directly related to the learning objectives of the lab. You are encouraged to use online resources to further your

understanding of the material to successfully answer questions related to the lab assignment (in other words, use your research skills).

All lab assignments have been tested by the instructor and/or lab assignments. Due to the nature of certain software packages and configurations in the lab, the assignments may or may not work as intended. You are encouraged to ask questions if something appears not to work correctly. However, there are certain instances where things are intended not to work correctly, and the instructor and lab assistant will indicate as such. When in doubt, do a little research.

Exam Policies

Please review the schedule of classes for the Final Exam schedule. Should you have a scheduling conflict with the final exam, or, per university policy, you have more than 2 final exams scheduled on the same day, you must contact the instructor and coordinate an alternative time by the end of Week 3. Any requests made after Week 3 are not guaranteed to be accommodated.

Per USC policy, Final Exams must be scheduled during the assigned final examination schedule. It is your responsibility to arrange your travel after the scheduled date of the final exam.

All students are required to participate in the final exam and/or project. Failure to take the final exam and/or submit a final project will result in an automatic failure in the class.

No make-up exams (except for documented medical or family emergencies) will be offered, nor will any changes be made to the Final Exam schedule. Missing your alarm is not an emergency. A documented medical event (car accident with documentation), family emergency (death in the family), or alien abduction can be considered emergencies.

Contacting the Instructor, Lab Assistants, or Graders

When emailing the lab assistants, graders, or instructor, please include your full name, student ID, class name and number, and class section (day and time).

Emails sent to the lab assistants or graders should have a response within two business days. The instructor will endeavor to respond to emails within two business days. Do not email anyone with the expectation of an immediate response within the hour. Please do not complain when we have not responded to your email ten minutes before the assignment deadline.

Questions regarding individual clarification or regrade must be made through email to both the lab assistants and the instructor. When requesting a regrade, the instructor has the prerogative to alter a grade higher or lower based upon a review of the entire assignment. Be absolutely certain before requesting a regrade of any assignment or exam – if you are going to roll the dice, be certain of your gamble.

Questions about lab assignments should be submitted through the class discussion board (typically Piazza). This will have a faster response rate. Do not post code or answers on Piazza.

The instructor will post his/her regular office hours on Blackboard/Brightspace. You may request a meeting with the instructor outside of normal office hours. Should you go to the instructor's office outside of normal office hours or outside of a scheduled meeting, do not expect the instructor to be able to meet with you. We do have other responsibilities outside of the class.

Attendance Policy

You are expected to be in the classroom on time and distraction-free. As this class meets once a week and is lecture and lab, any student who misses more than two classes is in danger of failing the course. Please see the instructor immediately if you have missed two or more class meetings.

This is a lab-based class. Certain class sections will be lecture, lab, or a combination of lecture and lab. Attendance is vital to success in this class, and punctuality is vital to your professional career. The lab assistants will be taking attendance for every class meeting. If you anticipate missing a class due to an event, please email the lab assistants and instructor prior to the start of class. If you are sick, we want you to get better and not infect your fellow classmates – please email the lab assistants and instructor.

If you are not in class, it is not the TA's or the instructor's responsibility to teach you the material you missed. Attendance is mandatory for guest lectures. Guest lectures are tentatively noted in the syllabus and will be announced in class.

Writing Skills

A significant portion of the cyber security and digital forensics curriculum involves communicating by writing professional quality reports. These reports are held to standards expected by professionals in the industry who are writing reports for clients, attorneys, judges, juries, congresspeople, senators, POTUS, etc.

It is expected that the reports will be written with correct spelling, grammar, and language nuances of the American English language. A component of each report grade will be based on writing style, grammar, and word choice. These reports must be accessible to technical and non-technical readers alike. While you will not be writing comprehensive reports in 125 (unless you choose to do so), please properly communicate your lab and assignment findings.

It is recommended that you visit the USC American Language Institute (<http://ali.usc.edu/>) for resources to assist you in this course and your professional career. Writing assistance is also available from the Dornsife Writing Center (<https://dornsife.usc.edu/writingcenter/>). You do not need to be a Dornsife student to take advantage of the services from the Writing Center. Additional writing assistance is also available from the Viterbi Writing Center in the form of

Writing Consultations (<http://viterbi.usc.edu/students/undergrad/varc/writing-consultations.htm>). In accordance with university standards, plagiarism of any type will not be tolerated.

News Assignment

To promote class discussion, each student must submit an article for class discussion starting week three. Articles shall be posted with a hyperlink to the article and a one-paragraph summary to the class Blackboard news discussion board for the appropriate week.

News stories should directly pertain to topics covered in this class.

- Post a link to the proper week on the Blackboard news board at least one hour before class.
- Please submit a story that is no more than one week old.
- Please take care not to duplicate stories that have been submitted that week.
- If the story is behind a paywall or subscription wall or requires a login, please submit a PDF copy with the link.
- Be prepared to give a two-minute summary of the article and any surrounding background details to start the discussion.
- Press releases, including anything from prweb.com, are not valid news content
- Make sure you validate the veracity of your news story
 - o Example: Content from TheHackerNews may be inaccurate
- Groups will be posted to Blackboard once enrollment has settled.
- If you are in need of news sources, please visit <http://feedly.com/pclair>

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express written permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express written permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All Students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences that can include expulsion. Please familiarize yourself with the discussion of plagiarism and academic integrity in the USC Student Handbook:

<https://policy.usc.edu/studenthandbook>

Other forms of academic dishonesty are equally unacceptable. See additional information and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Policy on Generative AI

Since creating, analytical, and critical thinking skills are part of the learning outcomes of this course, all assignments should be prepared by the student working individually or, as allowed, in groups. Students may not have another person or entity complete any portion of the assignment. Developing strong competencies in these areas will prepare you for a competitive workplace. Therefore, using AI-generated tools is prohibited in this course, will be identified as plagiarism, and will be reported to the Office of Academic Integrity.

ChatGPT:

ChatGPT and similar programs and platforms represent great promise for the field of information technology, cybersecurity, and just about every other part of our world. Our policy on ChatGPT is as follows: you may use ChatGPT or similar programs for your assignments for this class, but treat them as a research *tool* and not a primary or secondary *source*. This means 1) cite your original source(s), and they can't be ChatGPT or similar tools directly, 2) treat everything those tools tell you to do or information they provide with a strong grain (pound?) of salt, and 3) *never* copy and paste or treat their output as a source or knowledgebase of ultimate authority. We want to emphasize the concept of using them as *tools* since they may guide you to the right answers; however, they can't and don't always do this correctly, and you may not know when they're telling the truth or making something up. If we suspect or determine that your assignments are being produced by AI-based tools or otherwise violate the guidelines above, your submissions will be treated as violations of the university's academic integrity policy and handled as such.

Course Schedule: A Weekly Breakdown

Week 1 – Week of August 26 – Introduction, Basics of Security, Ethics

- History of Info Sec, Types of Security
- Goals of Security, Laws & Ethics

News Group

None

Lab/Homework

Sign into Piazza
At Home Info Sec Lab

Reading Before Next Class

1. <http://www.gcflearnfree.org/computerbasics/inside-a-computer/1/>
2. <http://www.gcflearnfree.org/computerbasics/understanding-operating-systems/1/>

Week 2 – Week of September 2 (Labor Day Week) – Operating Systems

- History of Operating Systems, Operating System Components
- Physical Pieces of a Computer, POST, BIOS, EFI
- Intro to Cyber Range
- Intro to Command Line

News Group

None

Lab/Homework

Command Line Lab

Reading Before Next Class

1. <https://learn.microsoft.com/en-us/windows/win32/seccrypto/cryptography-concepts>

Week 3 – Week of September 9 – Security Tactics & Encryption

- Role of Information Technology v Information Security
- Security Tactics & Mechanisms
- Encryption Algorithms & Digital Signatures
- Hashing & Passwords

News Group

Group 1

Lab/Homework

Password Cracking Lab

Reading Before Next Class

1. <http://computer.howstuffworks.com/internet/basics/internet-infrastructure.htm/printable>
2. <http://computer.howstuffworks.com/ethernet.htm/printable>
3. <https://www.sans.org/reading-room/whitepapers/standards/osi-model-overview-543>

Week 4 – Week of September 16 – Networking Basics

- Basics of Network Hardware
- Network Topologies
- TCP Model
- IP & MAC Addresses
- NAT/DNS/Gateways

News Group

Group 2

Lab/Homework

<https://drfreckles42.itch.io/youre-the-os> [submit a screenshot of how far you got]

Reading Before Next Class

1. <https://www.digitalocean.com/community/tutorials/an-introduction-to-networking-terminology-interfaces-and-protocols>
2. <http://www.hardwaresecrets.com/how-tcp-ip-protocol-works-part-2/4/>
3. <https://www.bleepingcomputer.com/tutorials/tcp-and-udp-ports-explained/>

Week 5 – Week of September 23 – Networking II

- What is a packet? Network Protocols: TCP, UDP, ICMP
- Three Way Handshake
- PAR/Sliding Window
- Ports
- OSI 7 Layer Model, OSI Model v TCP Model

News Group

Group 3

Lab/Homework

Port Scanning Lab

Reading Before Next Class

1. <http://computer.howstuffworks.com/wireless-network.htm/printable>
2. <http://computer.howstuffworks.com/ip-telephony.htm/printable>

Week 6 – Week of September 30 – Advanced Networking Topics

- Network Devices including Virtual Private Networks (VPN) and Wireless Networking
- IP Addresses: IPv4 v IPv6
- Secure Network Topology
- Cyber Attack Lifecycle

News Group

Group 1

Lab/Homework

Vulnerability Assessment Lab

Reading Before Next Class

None

Week 7 – Week of October 7 – Virtualization & The Cloud – Midterm Review

- What is virtualization? How does it work? How does it power the cloud?

News Group

Group 2

Lab/Homework

None

Reading Before Next Class

None

Week 8 – Week of October 14 – Midterm Exam

Normal classroom, normal class time, bring your laptop

Reading Before Next Class

1. <http://www.darkreading.com/the-7-best-social-engineering-attacks-ever/d/d-id/1319411> (Read the entire article i.e. click through all nine pages)
2. http://www.pcworld.com/article/182180/top_5_social_engineering_exploit_techniques.html
3. <https://www.veracode.com/security/xss>
4. <https://hackingstuffs.com/attacks/sql-injection/>

Week 9 – Week of October 21 – Threats & Attacks

- Malware
- E-mail Threats
- Web Threats
- Protecting Yourself

News Group

Group 3

Lab/Homework

Final Project Assigned

Extra Credit Assigned

Owning a System Lab

Reading Before Next Class

None

Week 10 – Week of October 28 – Social Engineering

- What is it?
- Principles of Social Influence
- Tactics & Manipulation
- Popular Schemes

News Group

Group 1

Lab/Homework

Social Engineering Lab

Reading Before Next Class

1. http://www.clico.pl/services/Principles_Network_Security_Design.pdf
2. <https://msdn.microsoft.com/en-us/library/ff648651.aspx>

Week 11 – Week of November 4 – Lockdown & Enterprise

- Building Secure Networks
- Data Loss Prevention
- Rings of Trust
- Additional Layers of Security
- BYOD/Mobile Device Management

News Group

Group 2

Lab/Homework

Network Architecture Lab

Reading Before Next Class

1. <http://www.pearsonitcertification.com/articles/article.aspx?p=30077&seqNum=6>
2. <https://nces.ed.gov/pubs98/safetech/chapter4.asp>

Week 12 – Week of November 11 – Digital Forensics

- What is it?
- Types of Investigations
- Court Admissibility
- Incident Response Case Studies

News Group

Group 3

Lab/Homework

Forensics Lab

Reading Before Next Class

None

Week 13 – Week of November 18 – Information Security Management

- What is it?
- Attack Continuum: Before, During, After
- Termination Issues
- Policies

News Group

Group 1

Lab/Homework

Info Sec Management Policy

Reading Before Next Class

None

Week 14 – Week of November 25 (Thanksgiving Week) – TBD

News Group

Group 2

Lab/Homework

None

Reading Before Next Class

None

Week 15 – Week of December 2 – Course Conclusion

- Careers in Info Sec
- Certifications
- Conferences
- Exam Review

News Group

Group 3

Lab/Homework

None

Reading Before Next Class

None

Final Exam: xx December x at xPM (normal classroom, bring a laptop)

According to the Final Exam Schedule found at <https://classes.usc.edu/term-20243/finals/>

Statement on Academic Conduct and Support Systems

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. sites.usc.edu/counselingandmentalhealth

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. eeotix.usc.edu

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call
Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu ^β

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.