



School of Engineering
*Information
Technology Program*

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

Units: 2

Fall 2022

Day/Time: See Schedule of Classes

Class Location: See Schedule of Classes

Instructor: Gregg Ibbotson

Office: RRB 221

Office Hours: See Blackboard (and always by appointment)

Contact Info: ibbotson@usc.edu

All Emails Should Have a Response By Two Business Days

Teaching Assistant(s): TBA, See Blackboard

Office Hours: See Blackboard

Contact Info: Slack

IT Help: Viterbi Information Technology

Hours of Service: Monday-Friday 8AM – 9PM

Contact Info: Phone: 213-740-0517; Email: engrhelp@usc.edu

Program Mission: The goal of the Digital Forensics and Cyber Security program at USC is to develop the critical thinking, analytical reasoning, and technical writing skills that are necessary to effectively work in a junior level digital forensic or cyber security analyst role. This is accomplished through utilizing industry standard tools and techniques to investigate labs and cases based upon real-world investigations and intrusions. Students will study various areas of cyber investigations, including digital evidence gathering, reporting, examinations, and court presentations. Students will study cyber security tenants of risk analysis, remediation, as well as penetration testing and network security design.

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 the use of 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.

Learning Objectives

Upon completing this course, students will:

- Understand the fundamentals of information security
- Learn the basics of securing a workstation
- Understand basic networking and security technologies
- Understand the relationship between security and management
- Have a motivation to learn and improve their awareness and understanding of computers and security

Prerequisite(s): None

Course Notes

Course is letter graded, with any and all materials available on Blackboard (blackboard.usc.edu). Labs will be conducted in the virtual security lab during assigned class or lab time.

Technological Proficiency and Hardware/Software Required

It is assumed that the student has baseline technical knowledge (basic computer usage, basic internet usage). 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.

Required Readings and Supplementary Materials

- All course materials will be posted on Blackboard - <http://blackboard.usc.edu>
- Readings exist in the syllabus
- Codecademy – Python - <https://www.codecademy.com/tracks/python>
- Slack – All discussion will be conducted over Slack

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 (in other words, GTS – Google That Stuff...). All laboratory exercises will be graded on a point-scale, typically between 10 and 20 points and where required will use the Cyber Range. This special online environment allowing you access to a windows and Kali virtual machine, direct from your browser. Please ensure your browser is up to date (that's just good practice anyway!)

Grading Breakdown

| Content | Grade % |
|--------------------|------------|
| Lab Assignments | 40 |
| News Articles | 5 |
| Final Presentation | 5 |
| Midterm Exam | 15 |
| Final Exam | 20 |
| Final Project | 15 |
| | |
| | |
| Total | 100 |

Grading Scale

Course final grades will be determined using the following scale

| | |
|----|--------------|
| A | 93-100 |
| A- | 90-92 |
| B+ | 87-89 |
| B | 83-86 |
| B- | 80-82 |
| C+ | 77-79 |
| C | 73-76 |
| C- | 70-72 |
| D+ | 67-69 |
| D | 63-66 |
| D- | 60-62 |
| F | 59 and below |

Grading Policies

The Learning 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, case reports, 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 the 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 offered 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, Learning Assistants, or graders. TurnItIn may be utilized for some assignments, and you must make sure that 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 Learning Assistants. Some assignments (typically longer in length) will have a due date on 11:59:59 PM on the Friday or Sunday of the following week. Do not expect a timely response from the Learning Assistants, graders, or instructors if emailed after normal business hours particularly on the date 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 turned in 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 Learning 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.

The instructor and Learning Assistants reserve the right to not 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).

ITP 125 Learning Assistants are students who have formerly taken the course and performed well. They have been individually selected for their roles by the instructors. They understand the delicate balance between offering assistance to guide you towards the answer and outright giving you the answer. Do not assume that the Learning Assistants are being rude to you because they are not giving the answer, rather they are being told how much to assist from the instructors. Should any Lab Assistant feel like you are being rude, or even worse threatening them, they reserve the right to refuse assisting you and all queries must be through the instructor for the rest of the semester.

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 (especially the remote lab setup for COVID), the assignments may or may not work as intended. You are encouraged to ask questions if something appears to not work correctly. However, there are certain instances where things are intended to not 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 there be any changes 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, Learning Assistants or Graders

When emailing the Learning Assistants, graders or instructor, please be sure to include your full name, student ID, class name and number, and class section (day and time) in the email.

Emails sent to the Learning Assistants or graders will 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 Learning 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 (Slack). This will have a faster response rate. Do not post code or answers on Slack.

The instructor will post his/her regular office hours on blackboard. You may request a meeting with the instructor outside of normal office hours. Should you make an unscheduled stop 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 class, on time, and distraction free. As this class meets once a week and as it 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 at least two 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 the class, and punctuality is vital to success in your professional careers. The Learning Assistants will be taking attendance for every class meeting. If you anticipate missing a class due to an event, please email the **Learning 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 Learning Assistants and instructor. Should you miss a class with a lab assignment, contact the Learning Assistants to determine available times to come to the lab and finish your assignment.

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 that are expected by professionals in industry who are writing reports for clients, attorneys, board members, judges, juries, senators, 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 take care to properly communicate your lab and assignment findings.

If you are not a native English speaker and writer, 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 careers. 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 will be required to 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 Slack 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 pay-wall or subscription-wall or requires a login, please submit a PDF copy along with the link.
- Be prepared to give a short 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 you you validate the veracity of your news story
 - o Example: Content from TheHackerNews is frequently inaccurate
- Groups will be posted to Blackboard once enrollment has settled.
- You are expected to post 4 articles throught the semester based on your group number.
- Each proper posting is worth 1 point.
- If you are in need of news sources, please visit <http://feedly.com/pclair>

Additional University policies follow the course schedule.

ITP 125 - Course Schedule

Subject to Change Throughout The Semester

For some readings, you may need to copy and paste the link together, if it runs onto a second line

Purple = Graded Homeworks

Green = Participation

| Week | Topics/Daily Activities | News Group | Lab | Due Date | Reading Before Next Class |
|------|--|------------|------------------------------|---------------|--|
| 1 | <u>Introduction, Basics of Security,</u> History of InfoSec Types of Security Goals of Security | None | Case study Review | n/a | Watch 'Attack and Defence' youtube video https://www.youtube.com/watch?v=aGLiND1ABks How the internet works https://www.youtube.com/watch?v=x3c1ih2NJEg TCP (Transmission control protocol) https://www.youtube.com/watch?v=AYdF7b3nMto cables and signals https://www.youtube.com/watch?v=ZhEf7e4kopM&t=319s data centers https://www.youtube.com/watch?v=XZmGGAbHqa0 |
| 2 | <u>Threats Attacks and Mitigations</u> | Group 1 | Lab 1 Command-Line Lab | Fri Sept 9th | Computer Basics: Inside a Computer (gcfglobal.org) Computer Basics: Understanding Operating Systems (gcfglobal.org) |
| 3 | <u>Operating Systems</u> History of Operating Systems Physical Pieces of a Computer POST, BIOS, EFI OS Components | Group 2 | Interview Questions | | http://www.infosectoday.com/Articles/Intro_to_Cryptography/Introduction_Encryption_Algorithms.htm |
| 4 | <u>Social Engineering</u> Principles of Social Influence Tactics & Manipulation Popular Schemes | Group 3 | Lab 2 Social Engineering Lab | Fri Sept 23rd | http://www.cllico.pl/services/Principles_Network_Security_Design.pdf https://msdn.microsoft.com/en-us/library/ff648651.aspx |
| 5 | <u>Communication Skills Development</u> | Group 1 | News talks | In Class | |

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|----|--|---------|---------------------------------------|---------------------------|--|
| 6 | Networking Basics Network Topologies OSI Model IP & MAC Addresses NAT/DNS/Gateways | Group 2 | Lab 3 Port scanning | Fri October 7th | http://computer.howstuffworks.com/wireless-network.htm/printable http://computer.howstuffworks.com/ip-telephony.htm/printable |
| 7 | Advanced Networking TCP/IP Three-Way Handshake PAR/Sliding Window Ports, UDP, ICMP | Group 3 | Lab 4 Vulnerability scans | Monday October 17th | n/a |
| 8 | MIDTERM | none | n/a | In class week 8 | 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) http://www.pcworld.com/article/182180/top_5_social_engineering_exploit_techniques.html |
| 9 | Security Tactics & Encryption - Security Tactics & Mechanisms - Encryption Algorithms - Digital Signatures - Hashing - Passwords | Group 1 | Lab 5 Password Cracking Lab | Fri October 28th | 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 http://www.lewistech.com/rlewis/Resources/james.aspx |
| 10 | Cloud Technology – Guest Lecture | - | Lab 6 Owning a system with Metasploit | Fri November 4th | - |
| 11 | Data Leakage Prevention Building Secure Networks Data Loss Prevention Rings of Trust Additional Layers of Security BYOD/Mobile Device Management Working in Cyber Security | Group 3 | Lab 7 Secure Network Architecture Lab | Fri November 11th | http://www.pearsonitcertification.com/articles/article.aspx?p=30077&seqNum=6 https://nces.ed.gov/pubs98/safetech/chapter4.asp Update your Résumé https://nationalcareers.service.gov.uk/careers-advice/interview-advice/the-star-method https://www.prospects.ac.uk/careers-advice/cvs-and-cover-letters/how-to-write-a-cv |
| 12 | Digital Forensics What is it? Types of Investigations Imaging & Software Court Admissibility | | Interview Sessions | | |

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|----|--|----|-----------------------------------|------------------|--|
| | Case Studies | | | | |
| 13 | <u>Information Security Management</u> Attack Continuum: Before, During, After Termination Issues Policies | - | Lab 8 Security Policy Development | Fri December 2nd | |
| 14 | Thanksgiving | | | | |
| 15 | Review session | na | Group Presentations | In class week 15 | |

Statement on Academic Conduct and Support Systems

Academic Conduct:

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 in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

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

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

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

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu