

# From Hackers to CEOs: An Introduction to Information Security ITP 125 (2 Units)

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Fall 2017



## Objective

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

## Concepts

- 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 get 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.

## Prerequisites

None

## Instructor

Pierson Clair

## Contacting the Instructor

pclair@usc.edu

## Office Hours

See Blackboard (and always by appointment)

If you will be attending office hours, please e-mail me in advance.

## Lab Assistants

See Blackboard

## Lecture/Lab

Tuesdays 6-9PM in OHE 406

## IT Help

Hours of Service: 8AM-9PM; Phone: 213-740-0517; Email: engrhelp@usc.edu

## Required Textbooks

None. Required readings are listed in the syllabus.

## Website

All course materials will be posted on Blackboard. (<http://blackboard.usc.edu>)

Code Academy – Python - <http://www.codecademy.com/tracks/python>

Piazza – <http://piazza.com/> (you will receive an invitation via e-mail or you can join the class section)

## Grading

Grading will be based on percentages earned in assignments. Students will have structured labs throughout the semester, to be conducted during the scheduled lab time. In addition, students will have a midterm and final exam as well as a final project. Additionally, there will be 21 short programming assignments in python. These will be extra credit, worth up to one point each.

The following percentage breakdown will be used in determining the grade for the course.

Lab Assignments/News	45%
Class	5%
Participation/Attendance	
Midterm Exam	15%
Final Exam	20%
Final Project	15%
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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+
64% - 66%	D
63% and below	F

## Class Policies

- No make-up exams will be offered nor will there be any changes made to the Final Exam schedule or assignment due dates (except for documented medical or family emergencies).
- It is your responsibility to submit your assignments on or before the due date. **It is not the responsibility of the lab assistant or the instructor.** Do **not** turn in anything to your lab assistant!
- Unless otherwise noted, all lab assignments are due at the beginning of class the next class period. Assignments are due on the date listed in the syllabus at the beginning of class unless otherwise changed by announcement in class or via e-mail. Any assignment turned in late will incur a 25% penalty for the first 24-hour period that it is late, an additional 50% off for the second 24-hour period that it is late, and will not be accepted after 48-hours. All assignments must be turned in either in person to the instructor or via Blackboard. Do not e-mail assignments.
- 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.

- 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 me immediately if you have missed that number of class meetings.

## News Assignment

To promote class discussion, each student will be required to submit an article for class discussion starting week four. 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. Please take care not to duplicate stories that have been submitted that week.

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

- Post a link to the proper week on the Blackboard news board by 6PM before class.
- Please submit a story that is no more than one week old.
- 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 three-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
- Groups will be posted to Blackboard once enrollment has settled.
- Each proper posting is worth 2 points which is 10 points of your lab assignments grade

## Writing Skills

The goal of the Digital Forensics 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. A significant portion of the digital forensics curriculum involves communicating what was discovered by writing professional quality digital forensic reports. These reports are held to standards that are expected by professionals in industry who are writing reports for clients, attorneys, judges and juries. 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 reports in 125, 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 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.

## University Policies

### Incomplete and Missing Grades

Excerpts for this section have been taken from the University Grading Handbook, located at <http://www.usc.edu/dept/ARR/grades/gradinghandbook/index.html>. Please see the link for more details on this and any other grading concerns.

A grade of Missing Grade (MG) “should only be assigned in unique or unusual situations... for those cases in which a student does not complete work for the course before the semester ends. All missing grades must be resolved by the instructor through the Correction of Grade Process. One calendar year is allowed to resolve a MG. If an MG is not resolved [within] one year the grade is changed to [Unofficial Withdrawal] UW and will be calculated into the grade point average a zero grade points.

A grade of Incomplete (IN) “is assigned when work is no completed because of documented illness or other ‘emergency’ occurring after the twelfth week of the semester (or 12th week equivalency for any course scheduled for less than 15 weeks).”

### Statement on Academic Conduct and Support Systems

#### Academic Conduct & Integrity

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. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://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/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/departments/public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage [sarc@usc.edu](http://sarc.usc.edu) describes reporting options and other resources.

#### Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to your course instructor (or TA) as early in the semester as possible. DSP is located in STU 301 and is open from 8:30am to 5:00pm, Monday through Friday. Website and contact information for DSP [http://sait.usc.edu/academicsupport/centerprograms/dsp/home\\_index.html](http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html) (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) [ability@usc.edu](mailto:ability@usc.edu)

#### Emergency Preparedness/Course Continuity in a Crisis

In case of emergency, when travel to campus is difficult, if not impossible, USC executive leadership will announce a digital way for instructors to teach students in their residence halls or homes using a combination of the Blackboard LMS (Learning Management System), teleconferencing, and other technologies. Instructors should be prepared to assign students a “Plan B” project that can be completed ‘at a distance.’ For additional information about maintaining your classes in an emergency, please access: <http://cst.usc.edu/services/emergencyprep.html>

# From Hackers to CEOs: An Introduction to Information Security

## ITP 125 (2 Units)

Course Outline - Subject to Change Throughout the Semester

\*\* = Attendance Mandatory

### Week 1 – Week of August 21 – Introduction, Basics of Security, Ethics

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

#### News Group

None

#### Lab/Homework

Register for 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 August 28 – Operating Systems

- History of Operating Systems
- Physical Pieces of a Computer
- POST, BIOS, EFI
- OS Components

#### News Group

None

#### Lab/Homework

Command Line Lab

#### Reading Before Next Class

1. [http://www.infosectoday.com/Articles/Intro\\_to\\_Cryptography/Introduction\\_Encryption\\_Algorithms.htm](http://www.infosectoday.com/Articles/Intro_to_Cryptography/Introduction_Encryption_Algorithms.htm)

## **Week 3 – Week of September 4 – Security Tactics & Encryption**

- 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>
4. <http://www.lewistech.com/rlewis/Resources/james.aspx>

## **Week 4 – Week of September 11– Networking Basics**

- Network Topologies
- OSI Model
- IP & MAC Addresses
- NAT/DNS/Gateways

### **News Group**

Group 2

### **Lab/Homework**

Windows & Linux Networking Lab

### **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 18– Networking II**

- TCP/IP
- Three Way Handshake
- PAR/Sliding Window
- Ports
- UDP
- ICMP

### **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 25 – Advanced Networking Topics**

- Wireless Networking
- IPv4 v IPv6
- Network Devices
- Secure Network Topology
- VoIP & FTP

### **News Group**

Group 1

### **Lab/Homework**

Metasploit Lab

### **Reading Before Next Class**

n/a

## **Week 7 – Week of October 2– **\*\*Virtualization Guest Lecture\*\*****

### **News Group**

Group 2

### **Lab/Homework**

Nessus Lab

### **Reading Before Next Class**

1. <https://hackingstuffs.com/attacks/sql-injection/>
2. <https://www.veracode.com/security/xss>

## **Week 8 – Week of October 9 – Threats & Attacks**

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

### **News Group**

Group 3

### **Lab/Homework**

**Exam Review**

Sending Anonymous E-mail Lab

### **Reading Before Next Class**

n/a

## **Week 9 – Week of October 16 – **Midterm Exam****

Normal classroom, normal class time – Spring Break is next week! Hang in there!

### **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](http://www.pcworld.com/article/182180/top_5_social_engineering_exploit_techniques.html)

## **Week 10 – Week of October 23 – Social Engineering**

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

### **News Group**

Group 1

### **Lab/Homework**

Final Project Assigned

Extra Credit Assigned

Open Source Intelligence & Basic Social Engineering Lab

### **Reading Before Next Class**

1. [http://www.clico.pl/services/Principles\\_Network\\_Security\\_Design.pdf](http://www.clico.pl/services/Principles_Network_Security_Design.pdf)
2. <https://msdn.microsoft.com/en-us/library/ff648651.aspx>

## **Week 11 – Week of October 30– 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**

Secure 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 6 – Digital Forensics**

- What is it?
- Types of Investigations
- Imaging & Software
- Court Admissibility
- Case Studies

### **News Group**

Group 1

### **Lab/Homework**

File Recovery Lab

### **Reading Before Next Class**

n/a



## **Week 13 – Week of November 13 – Information Security Management**

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

### **News Group**

Group 3

### **Lab/Homework**

Policy Analysis & Creation Lab

### **Reading Before Next Class**

n/a

## **Week 14 – Week of November 20 – **\*\*Special Lab Day\*\*****

### **News Group**

Group 2

### **Lab/Homework**

Complete Lab Write-up

### **Reading Before Next Class**

n/a

## **Week 15 – Week of November 27– Course Conclusion**

- Careers in Info Sec
- Certifications
- Conferences

### **News Group**

Group 3

### **Lab/Homework**

**Exam Review & Final Project Completion**

### **Reading Before Next Class**

n/a

## **Final Exam**

According to Final Exam Schedule found at [classes.usc.edu](http://classes.usc.edu) – Normal Classroom