DFSC 1316 Digital Forensics and Information Assurance Fundamentals I

Fall 2017, 12:00 --12:50 Monday, Wednesday and Friday AB1-211

Instructor

Qingzhong Liu, Ph.D.
Associate Professor, Department of Computer Science, Sam Houston State University
Office: AB1-216D Office hours: MWF 8 – 9 and 10 – 11AM
Email: qxl005@shsu.edu Phone: (936) 294-3569

Course Description

This course introduces students to the fundamentals of digital forensics technology. Emphasis is placed on identifying threats to, and vulnerabilities of, computer systems and how to minimize them. The content covered in this course goes as the course outline below.

Course Outline

- Introduction to Digital Forensics and Information Assurance
- Multimedia forensics, file system forensics, smartphone forensics, and other application forensics fundamentals
- Computer basics – binary and hexadecimal vs. decimal, files, directories and data packets
- Network basics – OSI model, the functionality of network devices, e.g. hubs, switches and routers
- Network addresses – MAC and IP and the mapping between them
- Network protocols, packet format and analysis, and ways of intercepting data communications
- Cryptography and secure communications
- Hacker behaviors – how to identify, enumerate and penetrate vulnerable systems on networks
- Programming fundamentals – Introduction to python programming
- Python forensics – this practical guide will help you solve forensic dilemmas through the development of Python scripts, analyze Python scripts to extract metadata and investigate forensic artifacts, and master the skills of parsing complex data structures by taking advantage of Python libraries

IDEA Objective

Based on the Individual Development & Educational Assessment (IDEA), at the end of this course the ideal student should be able to present the following essential and important objectives:

1. **Gaining factual knowledge (terminology, classifications, methods, trends) in digital forensics and information assurance**
2. **Learning fundamental principles, generalizations, or theories in digital forensics and information assurance**

ABET Computing Educational Outcomes

Based on ABET computing educational outcomes, at the end of this course the ideal student should be able to present the following abilities (ABET outcome a, b, e, and i):

1. Apply knowledge of computing and mathematics appropriate to the discipline;
2. Analyze a problem, and identify and define the computing requirements appropriate to its solution;
3. An understanding of professional, ethical, legal, security and social issues and responsibilities;
4. Use current techniques, skills, and tools necessary for computing practice.

Textbooks (Optional)

Title	Author(s)	ISBN	Year	Publisher
Computer Forensics Principles and Practice	Volonino, Anzaldua and Godwin	0131547275	2009	Prentice Hall
Starting Out with Python, 3/E	Gaddis	9780133582734	2014	Addison-Wesley
Learning Python for Forensics	Chapin Bryce, Preston Miller	9781783285235	2016	Packt Publishing
Digital Forensics Workbook: Hands-on Activities in Digital Forensics	Michael K Robinson	9781517713607	2015	CreateSpace Independent Publishing Platform

Grading

Your grades will be determined according to the following:

Homework and labs	45%
Exams	40%
Group project and presentation	15%
Total	**100%**

Course letter grades will be assigned according to the following:

Total	Grade
>= 90%	A
80% <= TOTAL < 90%	B
70% <= TOTAL < 80%	C
60% <= TOTAL < 70%	D
TOTAL < 60%	F

Labs

These are practical exercises aiming to help student understand the course material better, as a part of assignments.

Project and Collaboration

Two or three students make a group and work on any topic in digital forensics and/or computer/networking security at your interest. You may utilize the resources on the internet but must have your own findings/progress. All groups are requested to submit a report including the objective, backgrounds, methodology and results, and make a presentation on your project in the week before the final. All homework assignments must be completed by each student individually. Each team project must be completed by the members of the team only.

Late Policy

Penalty for late work is 10% of the worth per calendar day late, unless an extension has been granted in advance.

Academic Dishonesty

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

Students should be aware, specifically, that the instructor reviews all programming assignments and exercises for evidence of collaborative work. While it is sometimes appropriate and encouraged for students to discuss concepts and ideas, it is never permissible to collaboratively work on coded examples, to share or swap completed or partially completed programming assignments. In addition it is not permitted for students to use code examples provided by the instructor without appropriate documentation/ citation of the use of that code.

Classroom Conduct

Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Cellular telephones and pagers must be turned off before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

Visitors in the Classroom

Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom.

STUDENTS WITH DISABILITIES POLICY:

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their

academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see:

http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf.