Course Syllabus

EEL 6935: Cybersecurity Case Studies

Class Periods: Tuesday 3-4:55pm | Thursday 4:05 – 4:55pm
Location: BEN 0328
Academic Term: Spring 2018

Instructor:

Name: Dr. Swarup Bhunia
Email: swarup@ece.ufl.edu
Telephone: 352-392-5989
Office Hours: Tuesday 2-3PM or by Appointment
Office Location: MAE 226C (601 Gale Lemerand Dr., Gainesville, FL 32603)

Teaching Assistants:

Fengchao Zhang
Kai Yang

Course Description

The course will cover real-life cyberattacks through a set of case studies and in-depth analysis of these attacks in terms of underlying causes – i.e. vulnerabilities and exploitations; the associated social/political/economical impact; and technical, legal, policy solutions to deal with them. These topics will be covered through a set of students’ presentations and guest lectures. The course will be rich in literature survey and reading. Students will be expected to read, analyze, think and talk. They will also be leading discussions and writing reports on various topics on cybersecurity.

Course Pre-Requisites / Co-Requisites

- EEL4930/EEL5934: Intro to Hardware Security and Trust

Course Objectives

This is an upper-level undergraduate and graduate-level course that intends to help students

- Analyze the real cyberattacks of diverse nature over the years and their impact on social and economic aspects. Learn history of cyberattacks.
- Understand how vulnerability across different layers of complex computing and communication systems spanning hardware, software, network layer leads to these attacks.
- Think sophisticatedly about cyberattacks and be able to distinguish between noisy attacks and serious ones.
- Think how secure systems can be developed based on a holistic understanding of

Key Concepts

Materials and Supply Fees

N/A

Recommended Textbooks and Software

There is no required textbook for the course. The following books serve as reference for concepts explored in this course:


Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Student Seminar / Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/8-1/12</td>
<td>Introduction to the Course and Student group formation for seminar/report</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>1/15-1/20</td>
<td><strong>Guest Lecture</strong>: Automotive Security – practical hacks on autonomous vehicles (NXP)</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>1/22-1/26</td>
<td>Understanding Mirai IoT botnets &amp; DDoS attacks</td>
<td>Student Presentation</td>
</tr>
<tr>
<td>4</td>
<td>1/29-2/02</td>
<td>Understanding Cyberattack and Cyberexploitation</td>
<td>Student Presentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Reference</strong>: William Owens, Kenneth Dam, and Herbert Lin, Technology, Policy, Law, and Ethics Regarding US Acquisition and Use of Cyberattack Capabilities, 1.1-1.7, Box 1.4 on page 32.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>02/05-02/09</td>
<td><strong>Guest Lecture</strong>: Network Router Security and FPGA Security (Cisco)</td>
<td>None</td>
</tr>
<tr>
<td>6</td>
<td>02/12-02/16</td>
<td>Cyberwar: Instances and What Lies in the Future? <strong>Reference</strong>: William Owens, Kenneth Dam, and Herbert Lin, Technology, Policy, Law, and Ethics Regarding US Acquisition and Use of Cyberattack Capabilities, 1.8, 2.3.1-2.3.2, and 9.3.</td>
<td>Student Presentation</td>
</tr>
<tr>
<td>7</td>
<td>02/19-02/23</td>
<td>Tracking Attackers: Attribution</td>
<td>Student Presentation</td>
</tr>
<tr>
<td>8</td>
<td>02/26-03/02</td>
<td>Cyber Defense and Deterrence</td>
<td>Student Presentation</td>
</tr>
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</table>
9 03/05-03/09  
**SPRING BREAK**

10 03/12-03/16  Ransomware Attacks: A Case Study on WannaCry ransomware attack  
Student Presentation

11 03/19-03/23  **Guest Lecture:** Applied Cryptography and standards (**NIST / NSA**)  
Student Presentation

12 03/26-03/30  Morris Worm, Melissa and ILOVEYOU Virus  
Student Presentation

Sony and Equifax Cyberattack


13 04/02-04/06  T. Bernard, "Equifax Says Cyberattack May Have Affected 143 Million in the U.S.", NYT, 2017.

Passwords, Usability, and Identity Management  


14 04/09-04/13  Student Presentation

15 04/16-04/20  **Guest Lecture:** Cybersecurity of critical infrastructure (**NSA**)  
None

Cybersecurity and The Threats to Privacy: Technical, legal, and Policy Solutions


16 04/24-04/25  Student Presentation

**Attendance Policy, Class Expectations, and Make-Up Policy**

Make sure you meet the following criteria. These are essential for you to be able to complete this course successfully.

- **Student Seminars** – Students need to be divided in groups (of two) and each group needs a make two presentations. The topics have to be selected from the list (provided in this syllabus) given to them in the beginning of the class. Each seminar will be 40 min long followed by a discussion session.

- **Rapporteur** – Each group of student has to serve as "rapporteur" for one of the student cyberattack presentation. The responsibility as Rapporteur is to lead the discussion after each student presentation. They need to gain enough background knowledge to ask a set of questions and steer the discussion so that issues which require further clarification can be covered.

- **Report Format** – Each student group has to submit a report individually on a real-life cyber-attack. The report is to be completed by computer - handwritten assignments will not be accepted. One report per group. A common report format will be provided to the students. salient issues regarding an attack including nature of attack, attacker and consequence; analyze vulnerabilities and root causes; raise questions and illuminate issues; propose technical, social, or federal measures to be taken to protect against the attack.

**Evaluation of Grades**

Your course grade is based on your overall performance through the entire semester. The relative weights for the final grade are the following:

- **Attendance** 15%
- **Seminar 1** 20%

https://ufl.instructure.com/courses/349917/assignments/syllabus
• Seminar 2  20%
• Report  45%

Grading Policy

<table>
<thead>
<tr>
<th>Percent</th>
<th>Grade</th>
<th>Grade Points</th>
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</thead>
<tbody>
<tr>
<td>93.4 - 100</td>
<td>A</td>
<td>4.00</td>
</tr>
<tr>
<td>90.0 - 93.3</td>
<td>A-</td>
<td>3.67</td>
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<tr>
<td>86.7 - 89.9</td>
<td>B+</td>
<td>3.33</td>
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<tr>
<td>83.4 - 86.6</td>
<td>B</td>
<td>3.00</td>
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<tr>
<td>80.0 - 83.3</td>
<td>B-</td>
<td>2.67</td>
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<tr>
<td>76.7 - 79.9</td>
<td>C+</td>
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<td>73.4 - 76.6</td>
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<td>60.0 - 63.3</td>
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<tr>
<td>0 - 59.9</td>
<td>E</td>
<td>0.00</td>
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More information on UF grading policy may be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu/evals. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/)
Syllabus for EEL6935: Cybersec Case Studies, Spring 2018

1/9/2018

Course Summary:

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<th>Details</th>
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The honor code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

**Campus Resources:**

**Health and Wellness**

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

**Counseling and Wellness Center:** http://www.counseling.ufl.edu/cwc

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/

**Academic Resources**

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.

http://www.counseling.ufl.edu/cwc


Library Support, http://cms.uflib.ufl.edu/ask

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/


Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

On-Line Students Complaints: http://www.distance.ufl.edu/student-complaint-process