CS4340 Offensive Security Techniques
Spring 2019 Syllabus


General Course Information

Instructor: Lopamudra Roychoudhuri  
E-mail: lroychoudhuri@angelo.edu  
Office: MCS 205E  
Campus Phone: (325) 486-5448  
Class Times: MWF 1:00-1:50 pm  
Classroom: MCS 114  
Course Web Site: Blackboard  
Office Hours: MTWRF 3:00-5:00pm

Prerequisite:
None.

Course Objectives:
This seminar-style course will introduce cybersecurity practices of penetration testing to the students. In virtual machine environments, the students will freely but safely exploit system vulnerabilities by deploying offensive security principles and determine how to avoid such problems. This course will provide students an effective active learning environment that will help students learn by doing and master security techniques. Experiments using Kali Linux, an established offensive security platform, Ubuntu, a popular Linux distribution, as well as Wireshark, a widely used packet analyzer tool, will be used to give students the essential hands-on experience.

Student Learning Goals:
Students who successfully complete this course will be able to:

1. Describe the importance of ethical hacking,  
2. Gather information about an organization using tools available in the World Wide Web,  
3. Scan target systems for open ports and operating system vulnerabilities,  
4. Identify vulnerabilities of web applications,  
5. Penetration-test a target system using Metasploit, an industry-standard tool,  
6. Create Denial-of-Service attacks,  
7. Explore the horizons of the ever-expanding technology by delivering a team project on a “real world” offensive security topic beyond what is covered in class.
Grading:

<table>
<thead>
<tr>
<th>Grading Criteria</th>
<th>Dates</th>
<th>Weights</th>
<th>Goals Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Weekly/biweekly</td>
<td>30%</td>
<td>1 thru 4</td>
</tr>
<tr>
<td>Project</td>
<td>Final presentation: Wed 5/8/19 1:00-3:00</td>
<td>35%</td>
<td>4 thru 5</td>
</tr>
<tr>
<td>Exam 1</td>
<td>2/11/19</td>
<td>15%</td>
<td>1 thru 2</td>
</tr>
<tr>
<td>Exam 2</td>
<td>4/1/19</td>
<td>20%</td>
<td>1 thru 3</td>
</tr>
</tbody>
</table>

GRADE | PERCENT
-------|---------
A      | 90 – 100
B      | 80 – 89
C      | 70 – 79
D      | 60 - 69
F      | 0 - 59

Week by week tentative schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/14, 1/16, 1/18</td>
<td>Module 1: Introduction and Review – Security, Networking, Linux</td>
</tr>
<tr>
<td>2</td>
<td>1/23, 1/25</td>
<td>Module 1: Review cont., Intro to Python</td>
</tr>
<tr>
<td>3</td>
<td>1/28, 1/30, 2/1</td>
<td>Module 2: Social Engineering and Reconnaissance</td>
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<tr>
<td>4</td>
<td>2/4, 2/6, 2/8</td>
<td>Module 2 cont.</td>
</tr>
<tr>
<td>5</td>
<td>2/11, 2/13, 2/15</td>
<td>Exam 1 on 2/11; Module 3: Scanning</td>
</tr>
<tr>
<td>6</td>
<td>2/18, 2/20, 2/22</td>
<td>Module 3 cont.</td>
</tr>
<tr>
<td>7</td>
<td>2/25, 2/27, 3/1</td>
<td>Module 3 cont.; Project proposal due on 2/25</td>
</tr>
<tr>
<td>8</td>
<td>3/4, 3/6, 3/8</td>
<td>Module 4: Penetration Testing with Metasploit</td>
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<tr>
<td></td>
<td>3/11 - 3/15</td>
<td>Spring Break</td>
</tr>
<tr>
<td>11</td>
<td>4/1, 4/3, 4/5</td>
<td>Exam 2 on 4/1; Module 5 cont.</td>
</tr>
<tr>
<td>12</td>
<td>4/8, 4/10, 4/12</td>
<td>Module 5 cont.</td>
</tr>
<tr>
<td>13</td>
<td>4/15, 4/17, 4/19</td>
<td>Module 6: Denial-of-Service</td>
</tr>
<tr>
<td>14</td>
<td>4/22, 4/24, 4/26</td>
<td>Module 7: Malware Analysis</td>
</tr>
<tr>
<td>15</td>
<td>4/29, 5/1, 5/3</td>
<td>Module 7 cont.</td>
</tr>
<tr>
<td>16</td>
<td>5/8/19 (Wednesday)</td>
<td>Final Project Presentation 1:00-3:00</td>
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Class Policies:

TEAMS
You will form teams of 2 or 3. The teams will be chosen on the first day of class and will be maintained till the end of semester.

ASSIGNMENTS
- There will be many kinds of assignments that you will complete in and out of class.
In-class assignments: these fall in two categories:

- Class work Assignments: We will discuss topics in class and work on assignments. You will be able to collaborate with your fellow students in order to complete these. Assignments that could not be completed in class will be taken out-of-class and turned in. The grade from these assignments will constitute 20% of the total Assignment grade.

- In-class quizzes: We will also have in-class quizzes that may be team-based or individual. The grade from the quizzes will constitute 10% of the total Assignment grade.

Out-of-class assignments: these fall in two categories:

- Graded homework assignments - the purpose of the homework assignments is to give you individual out-of-class practice on the topics that you are learning, and to explore some ideas more deeply. The grade from the homework assignments will constitute 70% of the total Assignment grade.

- Videos and/or readings – You will complete watching videos and/or some reading from the textbook or other sources prior to every class session. These will be announced beforehand. This is to ensure that you are familiar with the topics that will be discussed in the class and may be validated by the in-class quizzes.

All assignments, unless otherwise specified, must be submitted to Blackboard containing your name, course name, the title of the assignment and the due date.

No late assignment will be accepted. No e-mail or in-person submission is accepted. There are no exceptions to this rule.

All homework assignments should be the work product of each individual. Cheating occurs when a student either submits work for a grade that is not entirely due to his/her own effort or allows others to use her/his work. Cheating occurs when a student submits work product that is copied from another student. Cheating on an assignment or exam will result in a failing grade for the course. No student shall look towards the work of any other student during exams as it shall be construed as cheating.

**Academic Honor Code:** Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is available on the web at Academic Honor Codeii in Student Handbookiii. You should familiarize yourself with it. If a student violates this policy in any way, the student may receive a sanction of failure on the assignment/exam or failure in the course. If you have questions about appropriate citations, please ask.

**TEAM PROJECT**

Each team will select a topic that will allow the group to study some aspect of the “real world” networking in detail beyond what is covered in class. The outcome of the project will be a project report as well as a class presentation. You will submit your own report that clearly
shows your contributions to the project. Each team will prepare a 15-20-minute presentation and answer related questions.

**EXAMS**
All students must take the exams at the scheduled times. There are no makeup exams. Only exception will be student absence for observance of religious holy day (see below).

**ATTENDANCE**
Attendance is mandatory *no excused absences* and roll will be taken.

**GRADEBOOKS**
During the course of the semester, you are expected to monitor your performance on assignments and exams by accessing your grades online. It is your responsibility to: (1) insure that correct entries have been made into the gradebook, and (2) be aware of your performance in the class. Grade percentages are shown on this syllabus, so you can compute your own grade standing as the semester progresses.

**E-MAIL**
You are required to obtain an e-mail account. If you have any question about the course or need assistance, please contact me in person or by telephone during office hours, or by e-mail at any time.

**LAB POLICY**
No food or drinks are allowed in the lab.

**General Policy Statements**

**Academic Accommodations:**
Persons with disabilities that may warrant academic accommodations must contact the Student Life Office, Room 112, University Center, in order to request such accommodations prior to any accommodations being implemented. You are encouraged to make this request early in the semester so that appropriate arrangements can be made.

**Student Absence for Observance of Religious Holy Day**
1. “Religious holy day” means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20.
2. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.
3. A student who is excused under section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.
Modifications to the syllabus

The instructor and the university reserve the right to modify or change the syllabus (schedule, course requirements, grading policy, etc.) as the curriculum and/or program require(s).


iii https://www.angelo.edu/student-handbook/