Cyber Defense II COSC 4368
Computer Science
Spring 2016

A. COURSE INFORMATION
Course number/section: COSC 4368 -001
Class meeting time: TTH 9:30 PM – 10:45 PM
Class location: CI 230

B. INSTRUCTOR INFORMATION
Instructor: Steve Alves
Office location: CI-305
Office hours: MW 11:00 – 1:00
            Friday 11:00 – 12:00
Telephone: 825-3492
e-mail: steve.alves@tamucc.edu
Appointments: Via email

C. COURSE DESCRIPTION
Catalog Course Description
System Administration II topics focus on Microsoft Windows operating systems. This course is designed to provide students with essential knowledge and skills to implement, administer, and secure servers in a networked environment. Operating system concepts, such as installing a standalone and networked system, and user support services are explored. Topics will include security issues, user and group security, active directory services, PowerShell and bash scripting and PowerShell ISE, Visual Studios and program debugging.

D. PREREQUISITES AND COREQUISITES
Prerequisites
COSC 2365

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
Required Textbook(s)
N/A

Reference Text:
Metasploit The Penetration Tester's Guide

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT
By the end of this course, students should be able to:

- Understand the potential computer violations that may occur and the attackers.
- Understand the methods used in doing reconnaissance against a computer system or network.
- Understand how to prepare and defend against cyber crimes and information theft.
- Understand the appropriate measures to be taken should a cyber crime occur.
- Understand the effects of poor security in an organization.

G. MAJOR COURSE REQUIREMENTS AND GRADING

Student learning outcomes will be measured through the use of homework assignments, exams, and quizzes if necessary. Grading scale: A: 100-90, B: 89-80, C: 79-70, D: 69-60, and F: 59-0.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exams</td>
<td>70</td>
</tr>
<tr>
<td>Quizzes</td>
<td>TBD</td>
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<tr>
<td>Homework</td>
<td>30</td>
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<tr>
<td>Presentations</td>
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<td>Lab Reports</td>
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<td>Papers</td>
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<td>Other activities . . .</td>
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Course Objective
Describe gaining confidential information or unauthorized access through human intelligence (i.e. social engineering)
Discuss countermeasures to social engineering (training and education of users, administrators and personnel)
Describe phishing
Define organizational policies and procedures
Describe security policies (guidance provided by security policies, points of contact, roles and responsibilities, enterprise, issue specific, and system specific security policies)
Explain classification of information
Describe documentation, logs, and journals
Explain acceptable use of resources, internet usage policy, and e-mail usage policy
Describe separation of duties, need to know and least privilege
Discuss cybercrime and cybercrime laws,
Describe ethics (SANS Institute IT Code of Ethics)
Discuss fraud, waste, and abuse
Define user, group, and role management, personnel and administrative controls/permissions
Discuss password policies

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.
## Tentative Course Schedule (Subject to change)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>10/21/16</td>
<td>Introduction to Battlefield</td>
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<tr>
<td>01/26/16</td>
<td>Kali Linux – Assuring Security by Penetration Testing</td>
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<td></td>
<td>Chapter 2 Penetration Testing Methodology</td>
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<td></td>
<td>Open Source Security Testing Methodology (OSSTMM)</td>
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<td><a href="http://www.isecom.org/research/osstmm.html">http://www.isecom.org/research/osstmm.html</a></td>
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<tr>
<td></td>
<td>Flaw Hypothesis Methodology.pdf by Matt Bishop</td>
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<td>Vulnerability Analysis by Stefanie Wilcox</td>
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<tr>
<td>02/02/16</td>
<td>Kali Linux – Assuring Security by Penetration Testing</td>
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<td>Chapter 4 Information Gathering</td>
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<td><strong>HW1</strong></td>
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<tr>
<td>02/09/16</td>
<td>Kali Linux – Assuring Security by Penetration Testing</td>
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<td>Chapter 5 Target Discovery</td>
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<tr>
<td>02/16/16</td>
<td>Kali Linux – Assuring Security by Penetration Testing</td>
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<td>Chapter 6 Enumerating Target</td>
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<td>Nmap Scanning</td>
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<td>Vulnerability Scanning</td>
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<td>Enumeration, foot printing</td>
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<tr>
<td></td>
<td><strong>HW2</strong></td>
</tr>
<tr>
<td>02/23/16</td>
<td>Kali Linux – Assuring Security by Penetration Testing</td>
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<td>Chapter 7 Vulnerability Mapping</td>
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<td>Chapter 9 Target Exploitation</td>
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<td><strong>Exam 1</strong></td>
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<tr>
<td>03/01/16</td>
<td>Chapter : Web Application Vulnerabilities, <strong>HW3</strong></td>
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<tr>
<td></td>
<td>The Web Application Hacker’s Handbook</td>
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<td>Chapter 4 Mapping The Application page 111</td>
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<td>Attack Surface/Vectors</td>
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<td>03/08/16</td>
<td>Chapter : Web Application Vulnerabilities, <strong>HW4</strong></td>
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<td>OWASP - <a href="https://www.owasp.org/index.php/Main_Page">https://www.owasp.org/index.php/Main_Page</a></td>
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<td></td>
<td>The Web Application Hacker’s Handbook</td>
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<td>Chapter 14 Automating Customized Attacks page 572</td>
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<tr>
<td></td>
<td>Enumeration, foot printing</td>
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<tr>
<td>03/15/16</td>
<td>Chapter : Web Application Vulnerabilities, <strong>HW5</strong></td>
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<td>OWASP - <a href="https://www.owasp.org/index.php/Main_Page">https://www.owasp.org/index.php/Main_Page</a></td>
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<td>The Web Application Hacker’s Handbook</td>
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<td>Chapter 19 Finding Vulnerabilities in Source Code page 701</td>
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<td>Identifying flaw from source code analysis</td>
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<td></td>
<td>Understanding flaws that lead to vulnerabilities</td>
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</tbody>
</table>
10 03/22/16 Chapter: Web Application Vulnerabilities
OWASP - https://www.owasp.org/index.php/Main_Page
The Web Application Hacker’s Handbook
   Chapter 20 – A Web Application Hacker’s Toolkit page 764
   Vulnerability Scanning

11 03/29/16 Chapter: Web Application Vulnerabilities, HW6
OWASP - https://www.owasp.org/index.php/Main_Page
The Web Application Hacker’s Handbook
   Chapter 9 Attacking Data Stores
   Exam 2

12 04/05/16 CISSP – Chapter 10 Software Development Security – page 1171
   Database Models
Object Based vs Object Oriented DB – Wiki
Database Security Models.pdf by Robert Dollinger
NoSQL Databases – Wiki https://en.wikipedia.org/wiki/NoSQL
   HW7

13 04/12/16 Chapter 6: Using Granular Access Control
Implementing Database Security and Auditing by Ron Natan
   Database Access Controls (DAC, MAC, RBAC, Clark Wilson)
   HW8

14 04/19/16 Chapter 8 – Securing database to database Communication
Implementing Database Security and Auditing by Ron Natan
CISSP – Chapter 10 Software Development Security – page 1183
   Security Issues of Inference and Aggregation
   Common DBMS Vulnerabilities
   Overview of Database Vulnerabilities

15 04/26/16 Chapter 8 – Securing database to database Communication
Implementing Database Security and Auditing by Ron Natan
CISSP – Chapter 10 Software Development Security – page 1183
   Security Issues of Inference and Aggregation
   Common DBMS Vulnerabilities
   Overview of Database Vulnerabilities

16 05/03/16 Final Review

Note: This syllabus represents a general plan for the course. Deviations from this syllabus may be necessary during the semester and changes will be announced in class.
H. COURSEPOLICIES

Course Syllabus:
We will meet in lecture on Tuesday and Thursday, when new material will be presented. Non-text material may also be included in the lectures. The assignments, quizzes, and exams will be given during the class hours. You are responsible for all the material presented during the lecture.

Exams:
Exams will cover all lecture, assignments, quizzes and reading material. Exams must be taken on the hour they are scheduled. In the event, if you cannot attend the class to take the exam due to some emergency or some unavoidable situation (such as serious illness, death in the family, participation in university sports, religious observations, and so on) you must notify me as soon as possible before the exam and also you must validate your absence by providing me a document (e.g., with a letter from your doctor).

Homework Assignments and Quizzes:
Approximately 6 homework assignments will be given. Partial credit will be given for incomplete assignments. In addition, there may be a quiz from time-to-time. They will significantly be based on the material from the lectures and other material considered essential for the successful completion of this course. They will be handed out in the class during the lecture. The submission details will be provided to you along with the assignment. All the homework assignments are due at the beginning of the class on the due date. If the student is absent on the due date, it is the student’s responsibility to see to it that the assignment is submitted on the designated date. An assignment that is turned in after the class on the due date is considered one day late. There is a penalty for late submissions. 10% penalty for 1-2 days late. 25% penalty for 3-4 days late. 75% penalty for 5 days late. 100% penalty (i.e., no credit) if submitted after 5 days. If you have not completed your assignment by the due date, you should submit the work you have done for partial credit. No work will be accepted once the graded work has been returned or the solution has been disclosed to the class, except for unusual circumstances which the instructor feels reasonable. Be sure to backup your work. Note that any kind of hardware or software failure or machine unavailability in the lab does not merit an extension on the assignment. Diskettes upon which major examinations, assignments, projects or papers submitted may be retained by the instructor as a permanent record of the student’s work.

Grading Error:
All questions concerning a test score or grading of a returned test or assignment must be resolved within one week. It is always a good idea to keep all of your work until the end of the semester. In case of any recording errors or doubts, you may produce them for correction or verification.

Attendance:
You must attend all classes. In class attendance will affect your grade. You are responsible for any materials covered or handed out or announcements made for the tests, homework assignments in your absence. Records of your attendance will be maintained and reported.
to the university. Students found missing classes without the instructor’s permission will be automatically withdrawn from the course.

**Absence from class:**
Students are responsible for all materials covered in class and assigned. Should a student be absent from class, it is his/her responsibility to get the notes, etc. for that missed class. More important, should there be assignments, it is the student responsibility to obtain such assignments. No excuse will be accepted for assignments not turned in because the student was absent when it was due.

**Other Policies:**
Cell phones and computers must be turned off during class. Audio and video recording of any kind is not permitted in the classroom. First violation receives a warning. All succeeding violations result in a ten point deduction off the final exam. Any violation during a quiz or exam results in a ten percent deduction off the corresponding paper. No warnings for quizzes or exams.

**COLLEGE AND UNIVERSITY POLICIES**

- **Academic Integrity (University)**
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
  See Full University Policy at [http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity](http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity)

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility (can be in place of classroom/professional behavior)**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult
with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**

  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**

  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity**

  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

- **Academic Advising**
The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.