CDS355 Penetration Testing and Vulnerability Analysis
(3 credit hours)
Course Syllabus

Course Description

This course will equip students to evaluate a network to discover potential security vulnerabilities and rectify those issues. Students will learn the most common security mistakes as well as the necessary corrective action, and will be able to probe networks to determine if any of those common vulnerabilities can be exploited. The roles, missions, and appropriate applications of Red Teams and Blue Teams will be discussed.

Course Learning Outcomes

By the end of this course, you will be able to:

1. Describe intrusion typologies.

2. Categorize security mistakes and develop solutions.

3. Identify flaws from scanning.

4. Assess attack vectors.

5. Perform penetration testing on a network.

Required Textbook(s) and Resources

A digital copy of your textbooks are included with your DragonACCESS fees for this course. Use the Cengage MindTap tool in Moodle to view your book. We will also be using the MindTap virtual learning environment throughout this course. See instructions.

Wilson, R., S., Simpson, M., T., Antill, N. (2023). Hands-On Ethical Hacking and Network Defense (4th Ed.). Cengage

Be sure to also review the weekly **Explore** sections for additional library or supplementary resources. For access to databases, research help, and writing tips, visit the Tiffin University Library. You might consider registering for one of the library's many webinars on library

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research, source evaluation, copyright, and other topics, at the [Library Events - Upcoming Events](#) web page. For further assistance email a librarian, at: library@tiffin.edu.

Time Commitment

Effective time management is possibly the single most critical element to your academic success. To do well in this online class you should plan your time wisely to maximize your learning through the completion of readings, discussions, and assignments. Because of our accelerated, seven-week term, TU online courses are designed with the expectation that you dedicate a little over **six (6)** hours per credit hour to course activities and preparation **each week**. For example, for successful completion of a three-credit, seven-week online course you should reserve roughly **twenty (20) hours per week**.

To help plan your time and keep on track toward successful course completion, note the distinctive rhythm of assignment due dates:

1. All times assume Eastern Time (GMT-4).

2. Weeks begin at 12:00 a.m. ET on Monday and end at 11:55 p.m. ET on Sunday.

3. Unless otherwise noted, initial assignments or discussion posts are due by **11:55 p.m. ET** on **Wednesdays.**

4. Additional assignments or follow-up discussion posts are due by **11:55 p.m. ET** on **Saturdays, and**

5. Major assignments and reflections are typically due by **11:55 p.m. ET** on **Sundays.**

Learning Activities

Learning activities in this course will include one discussion forum per week in which students will share and discuss their understanding of key terms and themes introduced in the course materials. In addition, weekly assignments will require students to participate in two hands-on online lab activities per week. The final project will result in a paper in which students will reflect on what they have experienced and apply it to a real-world penetration testing scenario related to their field.

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Grading

The chart below identifies the individual contributions from each type of activity, per week.

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Total
Discussions Activity 1.1 (n/a) Activity 1.2 (30)	**Discussion** Activity 2.1 (30)	**Discussion** Activity 3.1 (30)	**Discussion** Activity 4.1 (30)	**Discussion** Activity 5.1 (30)	**Discussion** Activity 6.1 (30)	**Discussion** Activity 7.1 (30)	**210**
Labs Activity 1.3 (50) Activity 1.4 (50)	**Labs** Activity 2.2 (50) Activity 2.3 (50)	**Labs** Activity 3.2 (50) Activity 3.3 (50)	**Labs** Activity 4.2 (50) Activity 4.3 (50)	**Labs** Activity 5.2 (50) Activity 5.3 (50)	**Labs** Activity 6.2 (50) Activity 6.3 (50)	**Labs** Activity 7.3 (50)	**650**
(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	**Assignment** Final Activity 7.2 (140)	**140**
130	**130**	**130**	**130**	**130**	**130**	**220**	**1000**

Grading Scale

Grade	Percentage
A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	<60

Please see the Academic Bulletin for grade appeal information.

Course Schedule and Weekly Checklist

Topic	**Learning Activities** (Due by 11:55 p.m. ET on day designated)
Start Here	❏ MON: Activity 1.1: Course Anticipation - Initial Post

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Week 1: Ethical Hacking Federal Laws IP Addressing	❏ WED: Activity 1.1: Course Anticipation - Secondary Posts ❏ WED: Activity 1.2: Federal Computer Crime Laws - Initial Post ❏ SUN: Activity 1.3: Week 1 Lab: Ethical Hacking ❏ SUN: Activity 1.4: Week 1 Lab: System Hacking
Week 2: Network Attacks Malware Physical Security	❏ WED: Activity 2.1: Malware - Initial Post ❏ SUN: Activity 2.2: Week 2 Lab: Sniffing ❏ SUN: Activity 2.3: Week 2 Lab: Denial of Service
Week 3: Online Reconnaissance Footprinting Tools Social Engineering Methods	❏ WED: Activity 3.1: Online Reconnaissance ❏ SUN: Activity 3.2: Week 3 Lab: Footprinting and Reconnaissance ❏ SUN: Activity 3.3: Week 3 Lab: Social Engineering
Week 4: Network Scanning Port-Scanning Tools Enumeration	❏ WED: Activity 4.1: Port-Scanning Tools ❏ SUN: Activity 4.2: Week 4 Lab: Scanning Networks ❏ SUN: Activity 4.3: Week 4 Lab: Enumeration
Week 5: Operating System Vulnerabilities Vulnerability Scanning and Analysis System Hardening	❏ WED: Activity 5.1: System Hardening ❏ SUN: Activity 5.2: Week 5 Lab: Vulnerability Analysis ❏ SUN: Activity 5.3: Week 5 Lab: Malware Threats
Week 6: Web Application Vulnerabilities	❏ WED: Activity 6.1: Web Application Vulnerabilities ❏ SUN: Activity 6.2: Week 6 Lab: Hacking Web Servers

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Wireless Network Vulnerabilities Security Testing Tools	❑ SUN: Activity 6.3: Week 6 Lab: Hacking Wireless Networks
Week 7: Firewalls Intrusion Detection and Prevention Systems Honeypots	❑ WED: Activity 7.1: Intrusion Detection and Prevention Systems ❑ SAT: Activity 7.2: Final Project ❑ SUN: Activity 7.3: Week 7 Lab: Evading Firewalls

Tips for Success

Successful online learning requires a good deal of self-discipline and self-direction. As seekers of the truth, we should be willing to challenge and review one another's academic work in a spirit of respectful comradery and constructiveness. Your course is a place for you to stretch and grow as you benefit from the expertise, knowledge, experience and diverse perspectives of your instructor and peers. Constructive feedback will challenge you to stretch your own thinking, thereby expanding your knowledge, understanding and application.

To get the most out of your learning experience, you should actively engage (participate) in **ALL** course activities. Course elements are arranged chronologically. To complete a week, simply work your way "down the page" through all of the course materials and activities.

Your instructor will expect you to:

- Thoroughly review orientation materials (Start Here) within the first 48 hours of the term.

- Monitor your TU email account **daily** for important updates and announcements.

- Take ownership of your learning experience and act in a proactive, self-directed manner. That means:

  o Fully participate in all learning activities.

  o Complete assignments as described in rubrics or other instructions.

  o Submit all work on time and in the specified format (e.g. APA format for citations). Late assignments will be accepted at the discretion of your instructor. Penalties may apply.

  o Utilize and incorporate instructor-provided feedback to improve your work.

  o Ask questions so you can better understand course material or assignments.

- Use the highest standards of intellectual honesty and integrity. For more information, see the TU Library guide: [Digital Literacy: Netiquette and Internet Safety](#).
- Treat others respectfully and demonstrate "netiquette" (online politeness and respectfulness) at all times. TU celebrates cultural uniqueness and expects all students to be considerate and thoughtful throughout their learning experiences.

You should expect your instructors to:

- Post an introductory announcement/email at the beginning of each week to provide updates and help you prepare for the week's activities.

- Maintain an active and engaged presence in all course activities and throughout the course.

- Respond to your emailed questions within 48 hours, if not sooner.

- Clearly communicate any absences or expected non-participation due to extenuating circumstances. For example, "I will be traveling to attend a funeral this week and may not be able to respond to questions or participate in forums for a couple of days."

- When grading your work:
  - clearly indicate their grading approach (what they like to see in submitted work as well as what types of errors they tend to penalize more harshly),
  - thoroughly review and evaluate your submissions in a timely manner (in less than 5 days for most assignments), and
  - provide constructive feedback that indicates the strengths and weaknesses of your work and provides suggestions on how you can improve your performance on future assignments.

- Advocate for your success as a learner and help guide you toward successful completion of the course activities and most importantly, attainment of the course learning outcomes.

Accommodations

The **Office for Disability Services** supports the institutional commitment to diversity by providing educational opportunities for qualified individuals with disabilities through accessible programs and services in compliance with Section 504 of the Rehabilitation Act of 1973 and Title III of the Americans with Disabilities Act (ADA) of 1990.

If you need reasonable accommodations due to a documented disability, contact the Office for Equity, Access, & Opportunity 419.448.3021 or via email at disabilityservices@tiffin.edu.

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Additional Resources & Support

For technical support, either email moodlesupport@tiffin.edu or call the 24/7 Technical Support Call Center at 855-664-1200.

If you need to consult an academic advisor refer to TU's [Meet the Team](#) page.

For information about TU's peer tutoring program, see the Murphy Center's [Tutoring Policies and Procedures](#) page. Veterans and active military can seek assistance from TU's [Veteran and Military Services Web Page](#).

Comments or Concerns

TU's online programs are designed to be student-driven: to empower you with a voice and stake in your learning. Our courses feature multiple and varied ways you can share feedback, and we invite you to become an active voice and help drive our improvement efforts. In addition to providing in-course feedback, we encourage you to submit questions or comments directly to the online team at online@tiffin.edu.