Cosumnes River College

ITIS 164 / CISS 315

Ethical Hacking

An Online Course

Spring 2024 8w2

Instructor: Buddy Spisak

Online Office Hours: Mondays/Wednesdays 1:30 to 3:00 p.m.
Tuesdays/Thursdays 1:30 to 2:30 p.m.

Office: SOC 115
Phone: (916) 691-7062
E-mail: spisakj@crc.losrios.edu The turnaround time for responding to most e-mails is about one to two days. Be sure to include your name and the course number in each e-mail so I can identify who you are and what the e-mail is about.
Course Web page: https://lrccd.instructure.com
Instructor Web page: http://crc.losrios.edu/spisakj/

Prerequisites: CISS 310
Advisories: None
Lecture/Lab: Fully online (RERP/20399) Asynchronous – optional live office hours via zoom on Wednesdays from 7 to 9 pm.

Accepted for Credit: CSU
Class Credits: 3 units

Required Textbook: No textbook is required for this course.

Labs: Some labs are done through NDG Netlab+ at https://netlabve6.coastline.edu.

Supplies: Ear buds or a headset would be beneficial when listening to videos and a camera for Zoom conferencing.

A flash drive is recommended (at least 16GB, but 32GB is preferred) to store your work for the class**.**

Course Description:

This course introduces the network security specialist to the various methodologies for attacking a network. Students will be introduced to the concepts, principles, and techniques, supplemented by hands-on exercises, for attacking and disabling a network within the context of properly securing a network. The course will emphasize network attack methodologies with the emphasis on student use of network attack techniques and tools and appropriate defenses and countermeasures. Students will receive course content information through a variety of methods: lecture and demonstration of hacking tools will be used in addition to a virtual environment. Students will experience a hands-on practical approach to penetration testing measures and ethical hacking. C-ID ITIS 164

Student Learning Outcomes and Course Objectives:

- UNDERSTAND ETHICAL HACKING CONCEPTS, INCLUDING THE TERM "ETHICAL HACKER", AS WELL AS PENETRATION AND SECURITY TESTING CONCEPTS AND THE DIFFERENCES BETWEEN THEM (SLO #01).

    - Describe the role of an ethical hacker. Differentiate between what you can or cannot do legally as an ethical hacker.
    - Describe how the fundamental concepts of cyber defense can be used to provide system security.
    - List the fundamental concepts of the Information Assurance discipline.
- DESCRIBE MAJOR CONCEPTS AND ASPECTS OF THE TCP/IP PROTOCOL SUITE, INCLUDING EACH OF THE FOUR LAYERS OF THE PROTOCOL STACK: APPLICATION, TRANSPORT, INTERNET, AND NETWORK (SLO #02).
    - Describe the TCP/IP protocol stack and be able to review the addressing schemes and how they relate to TCP/IP protocol and security.
    - Explain the basic concepts of IP addressing.
    - Explain the binary, octal, and hexadecimal numbering systems.
- CATEGORIZE THE DIFFERENT TYPES OF MALICIOUS SOFTWARE AND THEIR EFFECT ON A SOFTWARE OR HARDWARE (SLO #03).
    - Critique the physical security attacks and their vulnerabilities.
    - Describe the different types of malicious software.
    - Classify the different methods of protecting against malware attacks.
    - Examine the architecture of a typical, complex system and identify significant vulnerabilities, risks, and points at which specific security technologies/methods should be employed.
- EVALUATE THE VARIOUS TOOLS USED FOR PORT SCANNING (SLO #04).
    - Research the different types of port scans currently being used; the tools available to most hackers; their purpose, and function.
    - Reason what ping sweeps are used for.
    - Uncover how shell scripting is used to automate security tasks.
- ANALYZE SEVERAL NETWORK SECURITY DEVICES THAT SECURITY PROFESSIONALS AND NETWORK ADMINISTRATORS CAN USE TO BETTER PROTECT THEIR NETWORKS (SLO #05).
    - Describe symmetric and asymmetric encryption algorithms. Describe possible attacks on cryptosystems.
    - Critique the advantages and disadvantages of different Intrusion Detection (IDS) technology currently available.
    - Critique the advantages and disadvantages of different software firewall technology currently available.
    - Investigate honeypots, their purpose and usefulness in a network security plan.
- ABILITY TO CREATE SIMPLE SCRIPTS/PROGRAMS TO AUTOMATE AND PERFORM SIMPLE OPERATIONS (SLO #06).
    - Demonstrate their proficiency in the use of scripting languages to write simple scripts (e.g., to automate system administration tasks).
    - Write simple and compound conditions within a programming language or similar environment (e.g., scripts, macros, SQL).
    - Write simple linear and looping scripts.

Methods of Measuring Student Learning Outcomes:

- You will demonstrate knowledge of course concepts through class discussions and achievement on quizzes, mid-term exam, and a final examination.
- You will demonstrate competence in the coursework by completing lab work and participating in discussions during the semester.

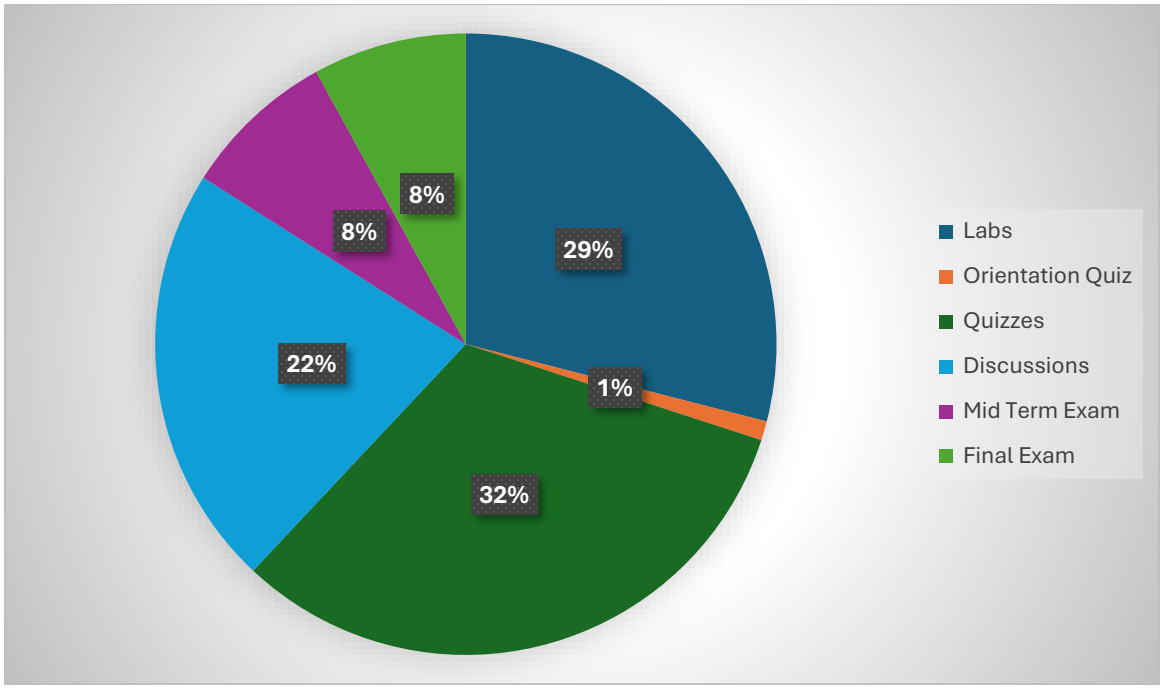
Student Obligations:

- **Attendance**: Since this course is online, it is important to participate frequently in the class.

- **Late Work**: Unless noted all assignments are due on Sunday by midnight each week. Late work will be accepted ONLY if you have contacted me prior to the due date either by e-mail or voice mail. In general, late work is due the next week, and no late assignments may be turned in after one week from the original due date, regardless of the reason. For every day an assignment is late, you will lose 10% of its grade.
- **Due Dates**: Unless noted, all assignments will be submitted in Canvas. If, for any reason, you cannot access Canvas or are unable to submit the assignment on time, please e-mail it to me instead so that you are not penalized for being late. Quizzes and discussion items cannot be taken past their due dates. If you miss a quiz and you want to make up points, you can take advantage of the extra credit assignments posted in Canvas. Everyone is welcome to work on the extra credit assignments. Typically, they are five to ten points each, depending on the difficulty of the assignment.
- **Labs**: There will be seven labs credited for homework for the class. The due dates are in the **SCHEDULE** portion of this handout. We will spend a lot of time working on lab activities. Each lab has a set of review questions that you will need to answer in Canvas to receive points for that assignment.
- **Discussions**: I want everyone to take a pro-active approach to learning this material. This includes using the discussion feature in Canvas to ask questions and answer other students' questions. I will also post questions each week that you can answer to further your understanding of the material. I expect two postings each week unless otherwise noted.
- **Language Matters:** Part of communicating effectively with one another involves communicating correctly with one another. This is not an English class; however, I will be looking at and commenting on the basic accuracy of your written English, such as sentence boundaries, spelling, and other basic grammar issues. While you will not fail the class because of your English, you may lose some points for frequent and repeated errors. Keep in mind that your use of English can influence your readers positively—or negatively.
- **Mid-Term Exam and Final Exam**: These exams will be administered through Canvas.
- **Plagiarism Policy:** It is inappropriate, and a violation of academic policy, to copy information from any source (including, but not limited to, textbooks, magazine articles, newspaper articles and internet articles) without giving proper credit to the author by using standard quotation procedures such as in-line quotes, footnotes, endnotes, etc. Quotes may not exceed 25% of the assignment's total length. You will receive no credit (0 points) for any assignment that copies any material from any other source without giving proper credit to the author(s). Repeat offenders of this policy are subject to academic discipline as outlined in the policies published by the college.
- **Cheating:** Students who cheat will receive a failing grade for the course. (See the Student Behavior and Academic Integrity page of the college website (https://crc.losrios.edu/about-us/our-values/student-rights-and-responsibilities/student-standards-of-conduct.)
- **CRC Honor Code:** Academic integrity requires honesty, fairness, respect, and responsibility. [See the Cosumnes River College Honor Code posted on the college website (https://crc.losrios.edu/about-us/our-values/student-rights-and-responsibilities/student-honor-code)].
- **E-mail:** Every student will be required to have an email account. If you do not have an email account, the college provides free email accounts for all current students. To activate your account, go to https://sso.losrios.edu then choose the option for *Expired/Forgotten Password* and then *Initial Password and Security Questions Setup*. Now, follow the directions provided.
- **E-mail etiquette:** I will not tolerate rude and demeaning comments or e-mails to anyone in this class. Please keep your comments and e-mails topic related. If I determine that a comment or e-mail to anyone else in the class is rude or demeaning, I will warn you once. If your behavior continues to be unacceptable, I will refer you to the administration of the college for disciplinary action.
- **Personal belongings:** All cell phones, beepers, pagers, etc. should be turned off or set to vibrate during any of the online lectures/labs.

- **Disabilities:** If you have a documented disability and wish to discuss academic accommodations, please contact me or contact the Office of Disabled Student Programs and Services at 916-691-7275 as soon as possible.
- **Canvas:** This class utilizes a product called "Canvas." It is highly recommended that you check the website frequently for scheduling updates and homework assignments. Most of the homework assignments and quizzes will be done on Canvas.
- **Online Course Responsibilities:** This course requires significant self-motivation. You must not get behind. Labs and weekly assignments can take up to 9 hours to finish. Please don't try to finish them in one day. Not all activities are created equal. Some may take a bit longer than others. You would normally spend 3 hours per week in class for this course: total of 162 hours. Allow yourself at least 9 hours per week to complete the activities online, including the time spent writing the class discussion postings. You should plan additional time to read the textbook and study for the quizzes. Some people believe that an on-line format provides a much easier way to study this subject than an on-campus framework because they love to read and avoid the parking problems. Others feel very intimidated at first. Be patient as you work your way through the activities.
- **Online Access via Zoom:** This class utilizes a product called "Zoom". It is highly recommended that you are in a quiet room without distractions, have stable internet access, and use a video camera with a quality microphone so that you are seen and heard by everyone.

Grading:



Course Topic		Points	Total	Approximate % the of Grade
Orientation Quiz (1)		10	10	1
Discussions (13)		20	260	22
Quizzes (13)		30	390	32
Labs (7)		50	350	29
Mid Term (1)		100	100	8
Final Exam (1)		100	100	8

Point System: There are 1210 total assigned points.

Grade Ranges: A=1089-1210, B=968-1088, C=847-967, D=726-846, F=0-725

Schedule: It is tentative and can change during the term. All changes will be located under the "Announcements" section in Canvas for the course.

	Day:		Lecture/Lab Schedule:	Assignment Due:	Due Date (By Midnight):
Week 1	Wed.	3/20	Orientation and Introductions	View the Online Orientation	Sun., Mar. 24
			Chapter 1: Introduction to Ethical Hacking	Orientation Disc.	
			Chapter 2: Introduction to Penetration Testing	Orientation Quiz	
			Lab #1		
Week 2	Wed.	3/27	Chapter 3: Social Engineering and Physical Security	Disc. #1 & 2	Sun., Mar. 31
			Chapter 4: Reconnaissance	Lab Review #1	
			Lab #2	Quizzes #1 & 2	
Week 3	Wed.	4/3	Chapter 5: Scanning	Disc. #3 & 4	Sun., Apr. 7
			Chapter 6: Enumeration	Lab Review #2	
			Labs #3	Quizzes #3 & 4	
			Finishing up the first half of the course	Disc. #5 & 6	Sun., Apr. 14
Week 4	Wed.	4/10	Chapter 7: Analyze Vulnerabilities	Lab Review #3	
			Chapter 8: System Hacking	Quizzes #5 & 6	
			Mid Term Exam		
			Labs #4		
Week 5	Wed.	4/17	Chapter 9: Malware	Disc. #7 & 8	Sun., Apr. 21
			Chapter 10: Sniffers, Session Hijacking, and Denial of Service	Lab Review #4	
			Labs #5	Quizzes #7 & 8	
				Mid Term Exam	
Week 6	Wed.	4/24	Chapter 11: IDS, Firewalls, and Honeypots	Disc. #9 & 10	Sun., Apr. 28
			Chapter 12: Web Servers, Web Applications, and SQL Injections	Lab Review #5	
			Labs #6	Quiz #9 & 10	
Week 7	Wed.	5/1	Chapter 13: Wi-Fi, Bluetooth, and Mobile Devices	Disc. #11 & 12	Sun., May. 5
			Chapter 14: Cloud Computing and Internet of Things	Lab Review #6	
			Final Review	Quiz #11 & 12	
			Labs #7		
			Finishing up the second half of the course		
Week 8	Wed.	5/8	Chapter 15: Cryptography	Lab Review #7	Sat., May. 11
			Security and Me		
			Final Exam		
			What is next after this class? meeting	Final Exam	All work needs to be turned in Sat., May. 11