Course Syllabus: Independent Study in Computer Science
Department of Computer Science,
McCoy College of Science, Mathematics & Engineering
CMPS 4993 Section 101
Fall 2023 August 28 - December 16, 2023

Contact Information

Instructor: Lopamudra Roychoudhuri
Office: Bolin 126E
Office hours: MTWR 12:30-1:30 pm; F 1:00-2:00 pm
Office phone: (940) 397-4191
E-mail: Lopamudra.roychoudhuri@msutexas.edu
Classroom: Faculty office
Class Times: Will meet once a week – Fri 2:30-4:00 pm

Course Description

This independent study will introduce cybersecurity practices of penetration testing. Virtual machine environments will enable exploiting system vulnerabilities freely but safely by deploying offensive security principles and determining how to avoid such problems. This course will utilize an effective active learning environment that will help 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 provide essential hands-on experience.

Course Prerequisites

N/A.

Student Learning Objectives

At the conclusion of this course, students should 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.

Textbook & Instructional Materials

Teixeira, Singh & Agarwal, Metasploit Penetration Testing Cookbook, 3rd Ed., Packt Publishing

Virtual Machines:

Kali Linux
Ubuntu
Metasploitable 2

Grading

Table 1: Course Grade

Grading Criteria	Dates	Weights	Objectives Assessed
Hands-on Assignments	Daily/Weekly	30%	1-4
Quizzes	Daily/Weekly	20%	1-4
Project	Last 8 weeks of the semester	15%	5
Midterm Exam	Fri 3/24/23	15%	1-4
Research Presentation and Report	Fri 11/13/23 (possibly at UGRCAF), End of semester	20%	1-4

Table 2: Grading Criteria

Grade	Percentage
A	90 or above
B	80 to 89
C	70 to 79
D	60 to 69
F	Less than 60

Table 3: Tentative Course Schedule

Week	Starting	Topics
1	8/28	Module 1: Introduction and Review – Security, Networking, Linux
2	9/4	Module 1: Introduction and Review – Security, Networking, Linux cont.
3	9/11	Module 2: Reconnaissance and Scanning
4	9/18	Module 2: Reconnaissance and Scanning cont.
5	9/25	Module 3: Intro to Penetration Testing with Metasploit
6	10/2	Module 3: Penetration Testing with Metasploit cont.
7	10/9	Module 4: Experiments with Metasploit
8	10/16	Module 4: Experiments with Metasploit cont.
9	10/23	Module 4: Experiments with Metasploit cont.
10	10/30	Summarize research results, start preparing for Fall UGRCAF
11	11/6	Continue preparing for Fall UGRCAF
12	11/13	Oral/Poster Presentation at UGRCA Forum
13	11/20	TBD
14	11/27	TBD
15	12/4	Research project report due

Class Policies

Flipped Classroom

Readings from the textbook and/or other sources and videos will be announced prior to class sessions. You will complete reading and watching these videos before class. In each meeting we will briefly discuss the material and assignments based on this material.

Assignments

These fall in two categories.

Quizzes: We will work on quizzes that will validate the readings. The grade from the quizzes will constitute 20% of the total grade.

Assignments: You will use various tools and virtual machines to practice on the topics that you are learning, and to explore some ideas more deeply. The grade from the assignments will constitute 30% of the total grade.

Research Project
You will select a topic that will require you to study some aspect of the "real world" penetration testing topic in detail. A possible outcome of the project will be an oral or poster presentation at MSU UGRCA Forum in November.

Exams
There will be one exam.
For planned absences: Exam may be taken early by prior arrangement.
For unplanned absences: Students need a valid university excuse (e.g., excuse from the doctor, death in the immediate family, etc.). The missed exam will be replaced with the final exam grade.

General Policies

Computer Requirements
Taking this class requires you to have access to a computer (with Internet access) to access online course material. Personal computer technical difficulties will not be considered a reason for extra time to submit assignments, tests, or online discussion postings. Computers are available on campus in various areas of the buildings, as well as the Academic Success Center. Contact your instructor immediately upon having computer trouble. If you have technical difficulties in the course, there is also a student helpdesk available to you. The university cannot work directly on student computers due to both liability and resource limitations, however they are able to help you get connected to our online services. For help, log into D2L.

Desire-to-Learn (D2L)
Extensive use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into D2L through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Assignment Submission Policy
All assignments, unless otherwise specified, must be submitted to D2L containing the student's name, course name, the title of the assignment, the due date and the date the assignment was turned in. *No e-mail or in-person submission is accepted.*
No late assignment will be accepted. There are no exceptions to this rule.

Attendance Policy
Although student attendance is not calculated into the grade, attendance will be taken each day to track students. If a student is absent more than 2 classes without an excuse and is not performing well in class, a report will be submitted to the Dean of Students and the student may be dropped from the class. Classes will not be streamed for absent students, whether it is excused or not.

Behavior in the classroom
Students are to assist in maintaining a classroom environment that is conducive to learning. This means that the presence of electronic devices other than your laptop are not to be seen, heard,

or implied, ever. Questions are encouraged and discussion is acceptable, provided it is pertinent and does not distract from the lesson.

Policy on Testing Process
The Department of Computer Science has adopted the following policy related to testing.

·   All bags, purses, electronics (turned off), books, etc. will be placed in the front of the room during exams, or in an area designated by the instructor.

·   Unless otherwise announced by the instructor, nothing is allowed on the desk but pen/pencil/eraser and test papers.

·   A student who leaves the room during an exam must turn in the test and will not be allowed to return.

Academic Misconduct Policy & Procedures
Cheating, collusion, and plagiarism (the act of using source material of other persons or generators, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). The Department of Computer Science has adopted the following policy related to cheating (academic misconduct). The policy will be applied to all instances of cheating on assignments and exams as determined by the instructor of the course. (See below for link to MSU definitions.)

·   1st instance of cheating in a course: The student will be assigned a non-replaceable grade of zero for the assignment, project or exam. *If the final grade in the course, does not result in a one letter grade reduction, the student will receive a one letter grade reduction in course.*

·   2nd instance of cheating in a course: The student will receive a grade of F in course & immediately be removed from course.

·   All instances of cheating will be reported to the Department Chair and, in the case of graduate students, to the Department Graduate Coordinator.

See Also: MSU Student Handbook: Appendix E: Academic Misconduct Policy & Procedures
https://msutexas.edu/student-life/_assets/files/handbook.pdf.

University Policies and Procedures

Change of Schedule
A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester is eligible for a100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy
A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. Two formulas (federal and state) exist in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

Student with Disabilities
Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible. Students should present appropriate verification from Disability Support Office during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification has been provided. For additional information, contact the Disability

Support Office in Clark Student Center 168 - Phone: (940) 397-4140. For more details, please go to Disability Support Services.

Policy on Concealed Handguns on Campus
Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Please note, open carry of handguns, whether licensed or not, and the carrying of all other firearms, whether open or concealed, are prohibited on campus. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage at MSU Campus Carry Policy https://msutexas.edu/campus-carry/rules-policies. If you have questions or concerns, please contact Interim MSU Chief of Police at steven.callarman@msutexas.edu.

Recording of Class Lectures
Permission must be requested in writing and obtained from the instructor before recording of class lectures. If permission is granted, the recording may only be used by the student making the recording. Recordings (or any class materials) may NOT be posted on any internet source without written permission of the instructor. Failure to adhere to the policy may result in removal from the course with a grade of F or other appropriate punishment.

Midterm Progress Report
In order to help students keep track of their progress toward course objectives, the instructor for this class will provide a Midterm Progress Report for all students in the course. Midterm grades will not be reported on the students' transcript; nor will they be calculated in the cumulative GPA. They simply give students an idea of where they stand at the midpoint of the semester. Students earning below a C at the midway point should a) schedule a meeting with the professor and b) Seek out tutoring.

Important Dates
Visit MSU's Registrar's website Important Dates.

Grade Appeal Process
Students who wish to appeal a grade should consult the Midwestern State University Undergraduate Catalog.

Notice
Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.