FITCHBURG STATE UNIVERSITY

These top fields will be completed by the SGOCE office.

Academic Year: * 2023-2024 SGOCE#: * 1

New Graduate Course Proposal

Form Procedure
To share the form with others prior to Submitting choose the Save Progress option at the bottom.
Create a PDF of the saved form go to Print and choose Save as PDF copy rather than print.
To access the saved form for editing or to finalize submission visit forms.fitchburgstate.edu to log in and view your Pending/Drafts under My Forms.

Course Title

Course Title: * Ethical Hacking

Proposed Banner Abbreviation: * Ethical Hacking

Banner limit of 30 characters, including punctuation, spaces, and special characters.

Department/Committee Information

The main contact person for the Graduate Curriculum Committee should fill out this form.

Requestor Name: * Xuzhou Chen

Members of the Graduate Curriculum Committee: Natasha Kourtonina, Nadimpalli Mahadev, Ricky Sethi

Department / Unit Developing: * Computer Science

Department Chair: * Dr. Nadimpalli Mahadev * nmahadev@fitchburgstate.edu

Academic Dean: Dr. Jennifer Hanselman jhanselm@fitchburgstate.edu

Program Chair: The Program Chair for this request is among the people listed above.
* (•) Yes
( ) No

Graduate Program: * MS CS

The above program would be responsible for scheduling, staffing & assessing this course.

Course Information

Course Description

* This course introduces the basic terminologies used in ethical hacking and penetration testing on Kali Linux. Students will learn to explore the vulnerabilities in various systems and operate the industry-leading tools and framework to perform penetration testing on different target systems.

Course Objectives

- Understand the realm of network security.
- Explain why people attack computers and networks.
- Define the roles, responsibilities, and common challenges of security personnel to successfully combat hackers.
- Explain the difference between hacking myths and hacking facts.
- Explain the denial-of-service (DoS) attack.
- Describe the causes of DoS attacks.
- Describe the evolution of programming exploits.
- Recognize Web server vulnerabilities.
- Describe the steps in the identification of incidents.

Rationale and expected outcomes of offering the Course

* Ethical Hacking has been offered as part of the cybersecurity concentration in our undergraduate CIS program. Recently the course has been taught as topics course in our MS CS and was very successful. The department is planning to create a Cyber Security Concentration to be offered for MS CS program. Cyber Security is becoming increasingly an important area and combating the hacking is one of the most important goals. This course teaches how to explore the vulnerabilities in various systems and operate the industry-leading tools and framework to perform penetration testing on different target systems.

What are the Learning Outcomes for the Course?

After the completion of the course, students will
- understand the realm of network security and explain why people attack computers and networks.
- learn to define the roles, responsibilities, and common challenges of security personnel to successfully combat hackers.
- know the difference between hacking myths and hacking facts.
- be able to explain what the denial-of-service (DoS) attack is and describe the causes of DoS attacks.
- be able to describe the evolution of programming exploits.
- recognize Web server vulnerabilities.
- be able to describe the steps in the identification of incidents.

Number of Credits: * 3

Discipline Prefix or Prefixes: * CSC

Brief rationale if more than one prefix:

Level of Course: *
- ○ 7000
- ◉ 8000
- ○ 9000

Brief rationale for level choice:: * This is an advanced course in MS CS

The course will be:
- ☑ Requirement
- ☑ Elective

Elective or Requirement Note/Special: Will be required for the planned cybersecurity concentration

Is there a similar undergraduate course? *
- ◉ Yes
- ○ No

How does this graduate course differ from the undergraduate one?

Does this course affect offerings in any other department or program? *
- ○ Yes
- ◉ No

Course Enollment

Expected Average Enrollment: * 20

This course is a replacement for: Course # / Name

Has the course been offered previously as a "Topics" course? *
- ◉ Yes
- ○ No

How often / when was it offered as a Topics course? Every semester

Is this an Extended Campus Course? *
- ○ Yes
- ◉ No

Which semester will this course be offered for the first time?: * Spring 2024

How often thereafter to be offered?: * Every semester

Course Requirements

Prerequisite course(s) if any: None

Additional Requirements

Laboratory Hours: Fieldwork Hours:

Pre-Practicum Hours: Practicum Hours:

Other Requirements (specify):

Syllabus Upload

New Course Syllabus Upload:

Signatures

Click on the Submit Form button at the bottom of the page after you have signed the form.
You should receive an email confirmation that your signature has been completed.

...3430343530
Xuzhou Chen — Requester Signature — 09/20/2023 — Date

...3737363331
Jennifer Hasselman — Academic Dean Signature — 09/20/2023 — Date

...3335303730
Nadimpalli Mahadev — Department Chair Approval — 09/20/2023 — Date

...3037353632
Becky Cooper Hleng — SGOCE Dean Signature — 09/20/2023 — Date

Graduate Council

The Graduate Council Chair Signature indicates that the council has discussed this proposal ad has decided it should move forward.

Graduate Council Chair Signature — Date: 10/17/2023

Institutional Research Signature — Date

Approval of the President — Date: 10/30/23

SGOCE Dean Initials: BCG — Date: 10/31/23

Reviewed by the Registrar: Barbara Cormier — Date: 11/1/2023

Friendly Amendments:

1. The graduate course covers the same topics as the undergraduate one. However, the instructors will provide a different set of assignments.

2. Revised "Course Objectives" - We added the ethical component in the "Course objectives" and made some slight changes on the other items.
   - Recognize the important issues related to ethical hacking.
   - Define the roles, responsibilities, and common challenges of security personnel to successfully combat hackers.
   - Identify various techniques and tools for performing different hacking phases.
   - Explain Identify the techniques used to cause distributed denial-of-service (DDoS) and buffer overflow attacks.
   - Describe the evolution of programming exploits and recognize vulnerabilities in several programming languages such as C, HTML5, Java and JavaScript.
   - Describe the evolution of programming exploits.
   - Recognize Identify Web server, SMTP, POP, IMAP, UNIX/Linux, and Windows Vulnerabilities.
   - Describe the steps in the identification of incidents.

Fitchburg State University
CSC8026- Ethical Hacking
Course Syllabus
FALL 2023

Instructor: Dr. Mohamed Meky
Office: Online
Telephone: 732-743-5067
E-mail: mmeky@fitchburgstate.edu
Office Hours: By appointment

Blackboard: This course will use the Blackboard to distribute course materials, communicate and collaborate online, post grades, and submit assignments. You are responsible for checking the Blackboard course site regularly for classwork and announcements.

Course Description

This course introduces the basic terminologies used in ethical hacking and penetration testing on Kali Linux. Students will learn to explore the vulnerabilities in various systems and operate the industry-leading tools and framework to perform penetration testing on different target systems.

Course Objectives

- Understand the realm of network security.
- Explain why people attack computers and networks.
- Define the roles, responsibilities, and common challenges of security personnel to successfully combat hackers.
- Explain the difference between hacking myths and hacking facts.
- Explain the denial-of-service (DoS) attack.
- Describe the causes of DoS attacks.
- Describe the evolution of programming exploits.
- Recognize Web server vulnerabilities.
- Describe the steps in the identification of incidents.

Required Textbook: Computer Security and Penetration by Alfred Basta, Nadine Basta and Mary Brown, Testing, 2nd Edition. Course Technology Incorporated, 2014. ISBN: 10: 0840020937, 13: 9780840020932

Required Virtual Labs

InfoSec Learning Virtual Lab Platform

1- Create an account and purchase the lab voucher code for "Ethical Hacking and System Defense" course form https://www.infoseclearning.com

2- After purchasing and getting the access code, link your lab account to the instructor and the course using the following information:
Instructor Email: mmeky@fitchburgstate.edu
Course Name: Ethical Hacking and System Defense
Course ID: WICWEVYQVN

Link your email to Fall 2023 section.

The final grade will be a weighted average according to the following:

Assignments and quizzes	50%
Hands-on Labs	50%

GRADING SCALE

4.0	95 - 100	A
3.7	92 - 94	A-
3.5	89 - 91	A-/B+
3.3	86 - 88	B+
3.0	83 - 85	B
2.7	80 - 82	B-
2.5	77 - 79	C+
2.3	74 - 76	C+
2.0	71 - 73	C
0.0	0 - 70	F
W	Withdrawn	
IN	Incomplete	
IP	In-Progress	

TENTATIVE OUTLINE/SCHEDULE:

Activity and assignment details will be explained in detail within each week's corresponding learning module. Weekly announcements will confirm the weekly tasks and assignments. When changes are necessary in this schedule, I will post an updated class schedule in Blackboard.

TENTATIVE OUTLINE/SCHEDULE:

Activity and assignment details will be explained in detail within each week's corresponding learning module. Weekly announcements will confirm the weekly tasks and assignments. When changes are necessary in this schedule, I will post an updated class schedule in Blackboard.

Week	Topics	Chapter Readings	Assignments
1	Ethics of Hacking and Cracking Reconnaissance	Chapter 1 Chapter 2	Ch1- Quiz Ch2- Quiz Lab 1: Performing Reconnaissance from the WAN Lab 1 quiz Introduction Discussion
2	Scanning Tools Sniffers	Chapter 3	Ch3- Quiz Lab 2: Scanning the Network on the LAN Lab 2 Quiz
3	Sniffers	Chapter 4	Ch4- Quiz Lab 3: Enumerating hosts using Wireshark. Lab 3 Quiz
4	TCP/IP Vulnerabilities	Chapter 5	Ch5- Quiz

			Lab 6: Capturing and analyzing network traffic. Lab 6 quiz
5	Encryption and Password Cracking	Chapter 6	Ch6- Quiz Lab 12: Breaking WEP and WPA traffic Lab 12 Quiz
6	Spoofing	Chapter 7	Ch7- Quiz Lab 4: Remote and local exploitation Lab 4 quiz
7	Session Hijacking	Chapter 8	Ch8- Quiz Lab 10: Attacking webservers from the WAN. Lab 10 Quiz
8	Hacking Network Devices	Chapter 9	Ch9- Quiz
9	Trojan Horses (All Theory)	Chapter 10	Ch10- Quiz Lab 5: Crafting and deploying malware using a remote access trojan rat. Lab 5 Quiz
10	Denial-of-Service Attacks	Chapter 11	Ch11- Quiz Lab 8 Lab 8 Quiz
11	Buffer Overflows	Chapter 12	Ch12- Quiz
12	Mail Vulnerabilities	Chapter 14	Ch14- Quiz
13	Web Application Vulnerabilities	Chapter 15	Ch15- Quiz Lab 11: Exploiting a vulnerable web application. Lab 11 Quiz
14	Windows Vulnerabilities	Chapter 16	Ch16- Quiz Lab 9: Using browser exploitation to take over a host. Lab 9 Quiz
15	UNIX/Linux Vulnerabilities	Chapter 17	Ch 17-Quiz Lab 15: 15-Performing SQL injection. Lab 15 Quiz

DISCLAIMER

This syllabus is meant to provide a general guidance of what to expect from this course. The instructor reserves the right to change the content or emphasize sections of this syllabus based on the progress of the class.

ACADEMIC INTEGRITY:

Academic integrity is central to the mission of educational excellence at Fitchburg State University. Each student is expected to turn in work completed independently, except when assignments specifically authorize collaborative effort. It is not acceptable to use the words or ideas of another person--be it a world-class philosopher or your lab partner--without proper

acknowledgment of that source. This means that you must use footnotes and quotation marks to indicate the source of any phrases, sentences, paragraphs, or ideas found in published volumes, on the internet, or created by another student. I generally have a zero-tolerance policy for cheating, and all violations will result in substantial penalties. Any form of academic dishonesty will be penalized with a failing grade ("F") in the class . Additionally, any violations of the Code may be referred to the Office of Student Conduct for further disciplinary action. If you have any doubts or questions about what constitutes academic misconduct, please do not hesitate to contact me. For further clarification of university policies regarding academic integrity, please consult the Office of Student Conduct at https://www.fitchburgstate.edu/offices-services-directory/office-of-student-conduct-mediation-education/

STUDENTS WITH DISABILITIES

Fitchburg State University encourages the full participation of individuals with disabilities in all aspects of campus living and learning. To support access and inclusion, Fitchburg State University offers reasonable accommodations to students who have documented disabilities. If you need course adaptations or accommodations because of a disability, if you have emergency medication information, or if you need special arrangements in case the building must be evacuated, please make an appointment at the beginning of the course to talk with me. It is important that the issues relating to disabilities be discussed with me as soon as possible. Disability Services is the primary support system for students with disabilities taking classes in the day and evening divisions.

SYLLABUS REVISIONS

This syllabus may be modified as the course progresses should the instructor deem it necessary. Notice of changes to the syllabus will be made through email and/or class announcements. It is the student's responsibility to check Blackboard for corrections or updates to the syllabus.