

CS 82.57 Course Outline as of Fall 2021**CATALOG INFORMATION**

Dept and Nbr: CS 82.57 Title: CYBEROPS

Full Title: Cybersecurity Operations

Last Reviewed: 2/22/2021

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

This course equips students with the knowledge and skills needed by today's organizations that are challenged with rapidly detecting cybersecurity breaches and effectively responding to security incidents. The student could be part of a team of people in Security Operations Centers (SOC) keeping a vigilant eye on security systems, protecting their organizations by detecting and responding to cybersecurity threats or a Systems/Network Administrator desirous of better securing their organization. Cisco Certified Network Associate (CCNA) Cyber Ops prepares candidates to begin a career working with associate-level cybersecurity analysts within security operations centers.

Prerequisites/Corequisites:**Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100 or appropriate placement based on AB705 mandates; and Completion of CS 81.21 and CS 81.81A and CS 82.22A and CS 82.58

Limits on Enrollment:**Schedule of Classes Information:**

Description: This course equips students with the knowledge and skills needed by today's organizations that are challenged with rapidly detecting cybersecurity breaches and effectively responding to security incidents. The student could be part of a team of people in Security Operations Centers (SOC) keeping a vigilant eye on security systems, protecting their organizations by detecting and responding to cybersecurity threats or a Systems/Network Administrator desirous of better securing their organization. Cisco Certified Network Associate (CCNA) Cyber Ops prepares candidates to begin a career working with associate-level cybersecurity analysts within security operations centers. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 100 or ESL 100 or appropriate placement based on AB705 mandates; and Completion of CS 81.21 and CS 81.81A and CS 82.22A and CS 82.58

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:

IGETC:	Transfer Area	Effective:	Inactive:
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CSU Transfer:	Transferable	Effective:	Fall 2021	Inactive:
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UC Transfer:		Effective:		Inactive:
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CID:

Certificate/Major Applicable:

Not Certificate/Major Applicable

Approval and Dates

Version:	01	Course Created/Approved:	2/22/2021
Version Created:	11/29/2020	Course Last Modified:	6/4/2022
Submitter:	Michael McKeever	Course last full review:	2/22/2021
Version Status:	Approved New Course (First Version)	Prereq Created/Approved:	2/22/2021
Version Status Date:	2/22/2021	Semester Last Taught:	Spring 2022
Version Term Effective:	Fall 2021	Term Inactive:	Fall 2022

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Classify the various types of network attacks
2. Analyze network intrusion data to identify compromised hosts and vulnerabilities
3. Apply incident response models to manage network security incidents

Objectives:

Students will be able to:

1. Install virtual machines to create a safe environment for implementing and analyzing cybersecurity threat events.
2. Explain the role of the Cybersecurity Operations Analyst in the enterprise.
3. Install virtual machines to create a safe environment for implementing and analyzing cybersecurity threat events.
4. Explain the Windows Operating System features and characteristics needed to support cybersecurity analyses.
5. Explain the features and characteristics of the Linux Operating System.
6. Analyze the operation of network protocols and services.
7. Explain the operation of the network infrastructure.
8. Classify the various types of network attacks.
9. Use network monitoring tools to identify attacks against network protocols and services.
10. Use various methods to prevent malicious access to computer networks, hosts, and data.
11. Explain the impacts of cryptography on network security monitoring.
12. Explain how to investigate endpoint vulnerabilities and attacks.
13. Evaluate network security alerts.
14. Analyze network intrusion data to identify compromised hosts and vulnerabilities.
15. Apply incident response models to manage network security incidents.

Topics and Scope:

- I. Cybersecurity and the Security Operations Center
 - A. The danger
 - B. Fighters in the war against cybercrime
- II. Windows Operating System
 - A. Windows overview
 - B. Windows administration
- III. Linux Operating System
 - A. Using Linux
 - B. Linux administration
 - C. Linux clients
- IV. Network Protocols and Services
 - A. Network protocols enable network operations
 - B. Ethernet and Internet Protocol (IP)
 - C. Connectivity verification
 - D. Address resolution protocol
 - E. The transport layer and network services
 - F. Network services enable network functionality
- V. Network Infrastructure
 - A. Network communication devices
 - B. Network security infrastructure
 - C. Network representations and topologies
- VI. Principles of Network Security
 - A. Attackers and their tools
 - C. Common threats and attacks
- VII. Network Attacks: A Deeper Look
 - A. Observing network operation
 - B. Attacking the foundation
 - C. Attacking what we do
- VIII. Protecting the Network
 - A. Understanding defense
 - B. Access control

- C. Threat intelligence
- IX. Cryptography and the Public Key Infrastructure
 - A. Cryptographic tools
 - B. Public key infrastructure supports network security
 - C. Endpoint security and analysis
 - D. Endpoint protection
 - E. Endpoint vulnerability assessment
- X. Security Monitoring
 - A. Technologies and protocols
 - B. Log files
- XI. Intrusion Data Analysis
 - A. Evaluating alerts
 - B. Working with network security data
- C. Digital Forensics
- XII. Incident Response and Handling
 - A. Incident response models
 - B. Computer Security Incident Response Team (CSIRT)

Assignment:

Reading assignments include:

1. Online research of security devices and deployment practices
2. Approximately 50 pages weekly from the textbook

Homework problems include:

1. Weekly online discussion thread participation
2. Hands-on exercises and class performances to demonstrate proficiency with topics
3. Online quizzes
4. Creation of network, operating system and security design diagrams and layouts

Other assignments include:

1. Quizzes (9 - 11) and skill demonstration exam
2. Classroom scenario-based exercises

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Weekly written online discussions

Writing 5 - 10%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Creation of network, operating system and security design diagrams and layouts

Problem solving 15 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Skill demonstration exam

Skill Demonstrations
20 - 30%

Exams: All forms of formal testing, other than skill performance exams.

Quizzes and skill demonstration exam

Exams
20 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation in scenario-based exercises

Other Category
5 - 20%

Representative Textbooks and Materials:

CCNA Cybersecurity Operations Companion Guide. Cisco Networking Academy. Cisco Press. 2018

CCNA Cybersecurity Operations Course Booklet. Cisco Networking Academy. Cisco Press. 2018

OTHER REQUIRED ELEMENTS

STUDENT PREPARATION

Matric Assessment Required:	E	Requires English Assessment
Prerequisites-generate description:	NP	No Prerequisite
Advisories-generate description:	U	User-Generated Text
Prereq-provisional:	N	NO
Prereq/coreq-registration check:	N	No Prerequisite Rules Exist
Requires instructor signature:	N	Instructor's Signature Not Required

BASIC INFORMATION, HOURS/UNITS & REPEATABILITY

Method of instruction:	02	Lecture
	71	Internet-Based, Simultaneous Interaction
	72	Internet-Based, Delayed Interaction
Area department:	CS	Computer Studies
Division:	72	Arts & Humanities
Special topic course:	N	Not a Special Topic Course
Program status:	2	Not Certificate/Major Applicable
Repeatability:	00	Two Repeats if Grade was D, F, NC, or NP
Repeat group id:		

SCHEDULING

Audit allowed:	N	Not Auditable
Open entry/exit:	N	Not Open Entry/Open Exit
Credit by exam:	N	Credit by examination not allowed
Budget code: Program:	0000	Unrestricted
Budget code: Activity:	0701	Computer & Information Science

OTHER CODES

Discipline:	Computer Information Systems	
Basic skills:	N	Not a Basic Skills Course
Level below transfer:	Y	Not Applicable
CVU/CVC status:	Y	Distance Ed, Not CVU/CVC Developed
Distance Ed Approved:	Y	Either online or hybrid, as determined by instructor
Emergency Distance Ed Approved:	N	None
Credit for Prior Learning:	N	Agency Exam
	N	CBE
	N	Industry Credentials
	N	Portfolio
Non-credit category:	Y	Not Applicable, Credit Course
Classification:	Y	Career-Technical Education
SAM classification:	C	Clearly Occupational
TOP code:	0708.00	Computer Infrastructure and Support
Work-based learning:	N	Does Not Include Work-Based Learning
DSPS course:	N	Not a DSPS Course
In-service:	N	Not an in-Service Course