

 SCHOOL OF ELECTRICAL, ELECTRONICS, AND COMPUTER ENGINEERING		Course Code and Title CPE173P-4 The Structure of Cyberspace: The Internet Backbone and Infrastructures	
		Curriculum: 2022-2023	Page 1 of 11
Prepared by:  NIERE-YUMANG, Aralyn N.	Approved by:  LINSANGAN, Noel B.	Revision Date: May 2024	Effectivity Date: May 2024

VISION

Mapúa University, a global leader in education, shall foster sustainable socio-economic growth in society through innovation, digital transformation, and lifelong education.




MISSION

- 1. The University shall provide a learning environment in order for its students to acquire the attributes that will make them globally competitive.
- 2. The University shall engage in publishable and/or economically viable research, development and innovation.
- 3. The University shall provide state-of-the-art solutions to problems of industries and communities.

PROGRAM EDUCATIONAL OBJECTIVES		MISSION		
		1	2	3
Within five years after graduation, graduates of the Computer Engineering program should have:				
1.	Undertaken, singly or in teams, projects that show ability to solve complex engineering problems.	✓	✓	✓
2.	Had substantial involvement in projects that take into consideration safety, health, environmental concerns and the public welfare, partly through adherence to required codes and laws.	✓	✓	✓
3.	Demonstrated professional success via promotions and/or positions of increasing responsibility.	✓		
4.	Demonstrated life-long learning via progress toward completion of an advanced degree, professional development/continuing education courses, or industrial training courses.	✓	✓	✓
5.	Demonstrated technical expertise, professionalism, and ethics in ICT, computer hardware and software systems development, entrepreneurship or other related fields in the practice of computer engineering for the advancement of industry and society.	✓		✓

ABET Student Outcomes		Program Educational Objectives				
		1	2	3	4	5
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	✓			✓	✓
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	✓	✓		✓	✓
3	An ability to communicate effectively with a range of audiences	✓	✓			✓
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts		✓	✓	✓	✓
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	✓	✓	✓	✓	✓
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	✓	✓		✓	✓
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	✓	✓	✓	✓	✓

PTC and CHED Student Outcomes		Program Educational Objectives				
		1	2	3	4	5
A	An ability to apply knowledge of mathematics and science to solve complex engineering problems	✓			✓	✓
B	An ability to design and conduct experiments, as well as to analyze and interpret from data	✓	✓		✓	✓
C	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, in accordance with standards;	✓	✓		✓	✓
D	An ability to function on multidisciplinary teams	✓	✓	✓	✓	
E	An ability to identify, formulate, and solve complex engineering problems	✓			✓	✓
F	An understanding of professional and ethical responsibility			✓	✓	✓
G	An ability to communicate effectively	✓	✓			✓
H	The broad education necessary to understand the impact of engineering solutions in the global and societal context		✓		✓	✓
I	A recognition of the need for, and an ability to engage in life-long learning				✓	✓
J	A knowledge of contemporary issues	✓	✓		✓	✓

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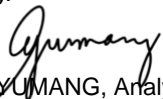

K	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	✓	✓	✓
L	Knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects in multidisciplinary environments	✓		
M	Understand at least one specialized field of Computer Engineering practice		✓	✓

COURSE SYLLABUS

- Course Code:** CPE173P
- Course Title:** The Structure of Cyberspace: The Internet Backbone and Infrastructures
- Pre-requisite:** CPE172P
- Co-requisite:** None
- Credit:** 3 units / 7.5 hours per week
- Course Description:** Introduces the core security concepts and skills needed to monitor, detect, analyze and respond to cybercrime, cyberespionage, insider threats, advanced persistent threats, regulatory requirements, and other cybersecurity issues facing organizations. It emphasizes the practical application of the skills needed to maintain and ensure security operational readiness of secure networked systems.
- Course Outcomes (COs) and Relationship to Student Outcomes**


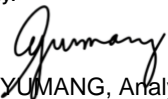

Course Outcomes After completing the course, the student must be able to:	Student Outcomes* ABET							Student Outcomes* PTC and CHED												
	1	2	3	4	5	6	7	a	b	c	d	e	f	g	h	i	j	k	l	m
1. Explain the features and characteristics of the common operating system needed to support cybersecurity analyses.				R		R	R						R	R		R		R		R
2. Analyze the operation of the network protocol, service and infrastructure.				R		R	R						R	R		R		R		R
3. Use network monitoring tools to identify attack and various methods to prevent malicious access to the organization.				R		R	R						R	R		R		R		R
4. Analyze network intrusion data to identify compromised hosts and vulnerabilities.				R		R	R						R	R		R		R		R

Level: I – Introduced; R – Reinforced; D – Demonstrate




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8. Course Coverage


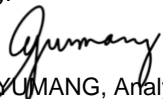

Week	Topic	Session	TLA			AT			Learning Objects	CO
			F2F (onsite)	Synchronous Online	Asynchronous Online	F2F (onsite)	Synchronous Online	Asynchronous Online		
Module 1: Cybersecurity and the Security Operations Center										
1	Mission and Vision of Mapua University	1	Lecture/ Discussion			CW1.A			Netacad Resource: Laboratory or Packet Tracer Activity at Chapters 1 and 2	CO1
	Laboratory Activity Demonstration									
	Orientation and Introduction to course	2		Reading Assignment			CW1.A			
Threat Actors and Defenders			Recorded Video Lecture							

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2	Operating System Overview	3	Lecture/ Discussion Laboratory Activity Demonstration			CW1.B			Netacad Resource: Laboratory or Packet Tracer Activity at Chapters 3 and 4	CO1
		4		Reading Assignment Recorded Video Lecture			CW1.B			
3	Network Fundamentals	5	Lecture/ Discussion Laboratory Activity Demonstration			CW1.C			Netacad Resource: Laboratory or Packet Tracer Activity at Chapters 5 and 10	CO1
		6		Reading Assignment Recorded Video Lecture			CW1.C			

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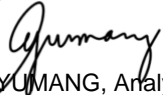

4	Network Infrastructure Security	7	Lecture/ Discussion Laboratory Activity Demonstration			QZ1 CW2.A			Netacad Resource: Laboratory or Packet Tracer Activity at Chapters 11 and 12	CO2
		8		Reading Assignment Recorded Video Lecture			CW2.A			
5	Threats and Attacks	9	Lecture/ Discussion Laboratory Activity Demonstration			CW2.B			Netacad Resource: Laboratory or Packet Tracer Activity at Chapters 13 to 17	CO2
		10		Reading Assignment Recorded Video Lecture			CW2.B			




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6	Network Defense	11	Lecture/ Discussion Laboratory Activity Demonstration			CW2.C			Netacad Resource: Laboratory or Packet Tracer Activity at Chapter 18 to 23	CO2
		12		Reading Assignment Recorded Video Lecture			CW2.C			
7	Cryptography and Endpoint Protection	13	Lecture/ Discussion Laboratory Activity Demonstration			QZ2 CW3.A			Netacad Resource: Laboratory or Packet Tracer Activity at Chapter 24 and 25	CO3
		14		Reading Assignment Recorded Video Lecture			CW3.A			

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8	Protocols and Log Files	15	Lecture/ Discussion Laboratory Activity Demonstration			CW3.B			Netacad Resource: Laboratory or Packet Tracer Activity at Chapter 26 to 28	CO3
		16			Reading Assignment Recorded Video Lecture		CW3.B			
9	Analyzing Security Data	17	Lecture/ Discussion Laboratory Activity Demonstration			CW3.C				
		18			Reading Assignment Recorded Video Lecture		CW3.C			
10	Assessments	19				QZ3				CO3
		20				PRJ				CO1-CO3
11	Final Assessment	21				PRJ				CO1-CO3
		22						Completion		

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9. Lifelong-Learning Opportunities
Gain job-ready practical skills for in-demand job roles in cybersecurity operations and prepare for industry recognize CCNA Cybersecurity Operations certification.

10. Contribution of Course to Meeting the Professional Component
Engineering Topics – 100%

11. Prescribed E-Book and Courseware
Cisco Networking Academy – Netacad

- CCNA Cybersecurity Operations

12. Course Evaluation

Student performance will be rated based on the following:




Assessment Tasks		Weight	Minimum Average for Satisfactory Performance
CO 1	CW	30	21
	QZ	30	21
	PE	40	28

The final grades will correspond to the weighted average scores shown below.

Average	Final Grade	Average	Final Grade
0.00 – 34.99	5.00	82.00 – 84.99	2.00
35.00 – 69.99	IP	85.00 – 87.99	1.75
70.00 – 72.99	3.00	88.00 – 91.99	1.50
73.00 – 75.99	2.75	92.00 – 95.99	1.25
76.00 – 78.99	2.50	96.00 - 100.00	1.00
79.00 – 81.99	2.25	For approved medical reasons only	I

Other Course Policies

- Attendance
According to CHED policy, students’ total number of absences should not be more than 20% of the total number of meetings or 9 hours for a three-unit-course. Students incurring more than 9 hours of unexcused absences automatically gets a failing grade regardless of class standing.
- Guided Learning Output
Guided learning outputs through various worksheets in each clusters of topics are assigned to the students. Problems encountered in the worksheets will be discussed in class.
- Written Examination

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Exams will be given face to face for Tri-X, Bio-X and Blended modes and online for UOX.

- d. Course Portfolio

Selected guided learning outputs and examinations are to be compiled and collected before the end of the term. The selection is based on statistical data gathering (lowest, median, highest). Guided learning outputs and examinations with marks lowest, median, and highest must be photocopied and must be given back to the instructor for course portfolio keeping.
- e. Language of Instruction

Lectures, discussion, and documentation will be in English. Written and spoken work may receive a lower mark if it is, in the opinion of the instructor, deficient in English.
- f. Dress and Grooming Codes

All of us have been instructed on the Dress and Grooming Codes of the University.
- g. Academic Integrity Policy




It is the student’s responsibility to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Any of the following sanctions may be imposed to any student who is found guilty of committing online academic dishonesty:

- a. Failed mark in the course.
- b. Suspension for a period of less than one term, with or without community service.
- c. Suspension for a period of one term or more, with or without community service.
- d. Non-readmission to the University.
- e. Dismissal from the University.
- f. Expulsion.

The following are considered academic dishonesty:

1. Using another MyMapua email address to login to any platform (such as BlackBoard and Coursera) with or without permission.
2. Asking or hiring someone else to do their exams, homework, Coursera course, papers, projects or other academic requirements.
3. Recording and saving copies of exam questions or answers, or answer keys for distribution.
4. Receiving copies of exam questions or answers, or answer keys to an exam from someone who has already taken it.
5. Plagiarizing or the unethical act of stealing the thoughts of another without proper citation or reference, acquiring information from the Internet without acknowledging the author, copying from another student’s work without permission and submitting it as own work.
6. Massive, pre-meditated, organized online cheating using instant messaging/email during a quiz or exam.
7. Any form of dishonesty in peer-reviewed assignments/submissions (e.g. Coursera peer-graded submissions).
8. Engaging in any activities that will dishonestly improve results, or dishonestly improve or damage the results of others.
9. Any other form of dishonesty or cheating in any assessment or course requirement.

All students who will violate the Academic Integrity Policy of the university will be given zero mark for the exam or for the activity and will be given a failing grade for the course. He or she will also be referred to the Prefect of Discipline for appropriate sanction.

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- h. Consultation Schedule
 Consultation schedules with the Professor are posted outside the EECE Faculty room and in the School web-page (<http://eece.mapua.edu.ph>). It is recommended that the student first set an appointment to confirm the instructor’s availability.
- i. Appeal system
 All appeals on student assessment must be made by the concerned student within one week after the return of the assessed student work.
- In case the student is not satisfied, no later than one week after the decision of the faculty has been made, he can elevate the appeal to the program chair or dean in case there is no program chair. The decision of the program chair or dean is final. The faculty must abide with the moderated decision of the program chair or dean.
- j. Use of generative AI
 It is expected that students will adhere to generally accepted standards of academic honesty, including but not limited to refraining from cheating, plagiarizing, misrepresenting one’s work, and/or inappropriately collaborating. This includes the use of generative AI tools that have not been cited or documented or authorized. Students will also be expected to adhere to the prescribed professional and ethical standards of the profession/discipline for which the student is preparing. Any student who engages in academic dishonesty or who violates the professional and ethical standards for the profession/discipline for which the students is preparing, may be subject to academic sanctions as the University’s academic Integrity Policy.

15. Course Materials to be Provided to Students

- 15.1. Syllabus
- 15.2. Lecture Materials
- 15.3. Video Lectures
- 15.4. Course Schedule

16. Committee Members

Caya, Meo Vincent C.
 Cruz, John Paul T.
 Lee, Marvin V.
 Niere-Yumang, Analyn P.
 Padilla, Dionis A.
 Singson, Lowell B.
 Sy, Jojo T.