	Universitas Negeri Surabaya Faculty of Engineering , Information Technology Education Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Computer Network Security	8320703030		T=3	P=0	ECTS=4.77	5	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Drs. Bambang Sujatmiko, M.T.

Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program which is charged to the course**	
	PLO-8	Mastering the concepts and implementation in developing software engineering, games, intelligent multimedia, and network computer engineering.
	PLO-13	Able to develop innovative educational products or learning resources using scientific design-based strategies to support teaching activities that can be integrated with ICT.
	Program Objectives (PO)	
	PLO-PO Matrix	

P.O	PLO-8	PLO-13

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Short Course Description	The Computer Network Security course teaches basic concepts of communication network security, security aspects, possible threats and attacks on network security, the basics of cryptography, and network security mechanisms such as host protection, firewalls, IDS, VPN tools and required software.	
References	**Main :**	

1. William Stallings. 2017. Cryptography and Network Security Principles and Practice Seventh Edition Global Edition. Pearson.
2. William Stallings. 2017. Network Security Essentials : Applications and Standards Sixth edition Global edition. Pearson
3. Joseph Migga Kizza. 2020. Guide to Computer Network Security Fifth Edition. Springer.

Supporters:	
Supporting lecturer	I Gusti Lanang Putra Eka Prismana, S.Kom., M.Kom. I Made Suartana, S.Kom., M.Kom.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1	Introduction to material, material coverage, application and relationship between network security and science in the field of informatics	1. Understand the network security course requirements 2. Understand network security courses and their relationship to other courses and knowledge in the field of informatics 3. Understand the application of network security in the real world		Lectures and discussions 3 X 50			0%
2	Understand the concepts, services and mechanisms in Network Security.	1. Understand Network security aspects 2. Understand the concept of network security services 3. Understand the concept of network security mechanisms		Lectures and discussions 3 X 50			0%
3	Detecting Security Problems and technological weaknesses in Computer Networks	1. Understand security problems in computer networks 2. Know the weaknesses of computer network technology 3. Distinguish between types of attacks on network security 4. Distinguish between types of attacks on network security 5. Implement the stages in identifying network security gaps		Lectures and discussions 3 X 50			0%
4	Understand the concept of cryptography as a basis for network security mechanisms	1. Understanding cryptography job search 2. Distinguish between types of cryptography 3. Determine the function and role of cryptography in network security		Lectures and discussions 3 X 50			0%

5	Distinguish how symmetric and asymmetric cryptographic algorithms work	1. Explain how symmetric cryptography works 2. Explain how Asymmetric cryptography works 3. Distinguish between the characteristics of symmetric and asymmetric cryptography		Lectures and discussions 3 X 50			0%
6	Understand the concept of cryptography in order to maintain the integrity of data/information	1. Explains data and information integrity 2. Applying cryptography to realize data and information integrity		Lectures and discussions 3 X 50			0%
7	Understanding problems in network security including the origin of the problem, how to detect the problem	Analyzing security problems on computer networks		Problem based learning 3 X 50			0%
8	UTS			3 X 50			0%
9	Understand network security aspects (threats and security mechanisms) at layers 2 and 3 of the TCP/IP model	1. Explain the concept of layer 2 and layer 3 TCP/IP and OSI models in relation to network security 2. Analyze security threats and types of attacks at layers 2 and 3 3. Implement security mechanisms at layer 2 and layer 3		Lectures and discussions 3 X 50			0%
10	Understand the concept of authentication as a network security mechanism	1. Explain the concept of authentication and its relationship to network security 2. Distinguishing Types of Authentication Mechanisms 3. Implement authentication mechanisms for network security		Lectures and discussions 3 X 50			0%

11	Understand network security aspects (threats and security mechanisms) at layer 4 TCP/IP model	1. Explains the concept of layer 4 TCP/IP and the OSI model 2. Analyze security threats and types of attacks at layer 4 3. Implementing security mechanisms in 4 (PKI, SSL, & TLS)		Lectures and discussions 3 X 50			0%
12	Understand how Firewalls work and implement in network security	1. Explain the concept and how a firewall works 2. Implementing a Firewall in the network		Lectures and discussions 3 X 50			0%
13	Understand how IDS and IDPS work and implementation in network security	1. Explains how IDS & IDPS work 2. Distinguishing Types of IDS 3. Implementing IDS configuration in the network		Lectures and discussions 3 X 50			0%
14	Understand the types or techniques and monitoring in the context of network security	1. Explain network security methods 2. Implementing monitoring mechanisms in the context of network security		Lectures and discussions 3 X 50			0%
15	Have the latest skills and knowledge regarding network security, both attacks and security mechanisms	Analyze trends and developments (attacks and prevention mechanisms) in network security		exploration 3 X 50			0%
16				UAS	UAS		0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
		0%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.

6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.