AGU
Graduate School of Engineering and Science Electrical and Computer Engineering Program

COURSE RECORD

Code	**ECE 514**
Name	**Network Security**
Hour per week	3 + 0 (Theory + Practice)
Credit	3
ECTS	7.5
Level/Year	Undergraduate/Graduate
Semester	Spring
Type	Elective
Location	TBD
Prerequisites	COMP308 Computer Networks
Special Conditions	-
Coordinator(s)	Assist. Prof. Samet TONYALI
Webpage	-
Content	An overview of information security; symmetric cryptography and hash functions; asymmetric cryptography; key management; public key infrastructure, X.509 certificates, and Kerberos; cyber-attacks, web security, IPSec, VPNs & firewall, intrusion detection, e-mail security, 802.11 security; user authentication and models for access control; attacks, malware; cryptanalysis.
Objectives	- To provide conceptual understanding of network security issues, challenges and mechanisms - To develop basic skills of secure network architecture and explain the theory behind the security of different cryptographic algorithms. - To describe common network vulnerabilities and attacks, defense mechanisms against network attacks, and cryptographic protection mechanisms. - To explore the requirements of real-time communication security and issues related to the security of web services.
Learning Outcomes	LO1 Students will understand the basic principles and practices in computer and network security. LO2 Students will be able to identify the major types of threats to information security and the associated attacks. LO3 Students will understand the role of cryptography in information security. LO4 Students will understand and learn cryptography algorithms and methods that are used in the past and present. LO5 Students will understand and learn what cryptanalysis is and what it is used for.
Requirements	-
Reading List	**Course Textbook:** Cryptography and Network Security: Principles and Practice, Stallings, William, Pearson, 7th Edition. The author's web page related to the textbook: http://williamstallings.com/Cryptography/Crypto8e-Student/ **Additional Materials:** B. Forouzan, "Cryptography and Network Security," McGraw-Hill, 1st edition, 2008. C. Kaufman, R. Perlman, M. Spencer, "Network Security: Private Communication in a Public World", 2nd Edition, Prentice Hall, 2002.
Ethical Rules and Course Policy	

LEARNING ACTIVITIES

Activities	**Number**	**Weight (%)**
Lecture	13	25%

Group Works	1		25%
Presentations	2		25%
Site Visits	1		25%
		Total	100

ASSESSMENT

Evaluation Criteria	**Weight** (%)
Quizzes	05%
Assignments	25%
Group Project & Presentations	20%
Attendance/Participation	05%
Midterm	20%
Final Exam/Submission	25%
Total	100%

For a detailed description of grading policy and scale, please refer to the website https://goo.gl/HbPM2y section 28.

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COURSE LOAD

Activity	**Duration** (hour)	**Quantity**	**Work Load** (hour)
In class activities	3	13	39
Homework	9	6	54
Group work	15	1	15
Research (web, library)	4	12	48
Required Readings	2	10	20
Pre-work for Presentation	7	2	14
Midterm	15	1	15
Final	20	1	20
		General Sum	**225**

ECTS: 7,5 (Work Load/25-30)

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
LO1	3	4	2	1	4	2								
LO2	3	4	3	3	4	2								
LO3	5	5	5	4	2	4								
LO4	5	5	5	5	4	5								
LO5	5	5	2	5	3	5								

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

WEEKLY SCHEDULE

W	**Topic**	**Outcomes**
1	Introduction to Information Security Lab/Activity:	LO1
2	Cryptography – Symmetric Cryptography and Hash Functions Lab/Activity: Assignment 1	LO1, LO2
3	Cryptography – Asymmetric Cryptography Activity: Project Assignment	LO1, LO2
4	Cryptography – Key Management Activity: Assignment 2	LO1, LO2, LO3
5	Cryptography – PKI, X.509 Certificates, and Kerberos Activity:	LO1, LO2, LO3
6	Network Security – Attacks, Web Security Activity: Assignment 3	LO1, LO2, LO3
7	Network Security – IPSec-1, IPSec-2 Activity:	LO1, LO2, LO3, LO4
8	Network Security – VPNs & Firewalls, Intrusion Detection Activity: Midterm, Assignment 4	LO1, LO2, LO3, LO4
9	Network Security – E-mail Security, 802.11 Security Activity:	LO1, LO2, LO3, LO4
10	Access Control – User Authentication, Models Activity: Assignment 5	LO1, LO2, LO3, LO4
11	Program Security – Attacks, Malware Activity: Assignment 6	LO1, LO2, LO3, LO4
12	Cryptanalysis Activity:	LO1, LO2, LO3, LO4, LO5
13	Project Presentations	

Prepared by Assist. Prof. Samet TONYALI
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