

COURSE INFORMATION					
Course Title	Code	Semester	L+P +I Hour	Credits	ECTS
Penetration Tests and Ethical Hacking	CIS 514		3+0+0	3	10

Prerequisites

Language of Instruction	English
Course Level	Master's Degree
Course Type	Elective
Course Coordinator	Asst. Prof. Mustafa Asım Kazancıgil
Instructors	Asst. Prof. Mustafa Asım Kazancıgil
Assistants	
Goals	The goal of this course is to provide students with a survey of different aspects of attacks, penetration testing, policies and software, and introduce ethical (White) hacking methods..
Content	Fundamentals of ethical hacking and security penetration testing, Cryptography protocols, authentication and security protocols, vulnerability scanning in systems, security reconnaissance using Kali Linux to perform buffer overflows, introduction to social engineering, reconnaissance, evasion and post exploitation corrective techniques.

Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
Information Systems graduates know the basic components of operating systems and networks.	3,6,9	1,3,4	A,B,C
Information Systems graduates know what the basic OS security threats are.	2,3,6,9	1,2,3,4	A,B,C
Information Systems graduates know what the basic security threats in networks are.	3,6,9	1,3,4	A,B,C
Knows security protocols and their implementation.	2,6,9	1,3,4	A,B,C
Knows how to take countermeasures against security threats and hacking.	3,6,9	1,3,4	A,B,C,D
Knows and implements cryptographic measures.	3,9,6	1,2,3,4	A,B,C,D
Knows and implements authentication measures	3,9	1,2,3,4	A,B,C,D
Knows ethical hacking	3,6,9	1,3,4	A, B, C, D

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Discussion, 4: Lab Work
Assessment Methods:	A: Testing, B: Laboratory C: Homework D: Project

COURSE CONTENT		
Week	Topics	Study Materials

1	Introduction to Ethical Hacking and Penetration Testing
2	Kali Linux
3	Passive and Active Reconnaissance
4	Hacking networking devices and web applications
5	Hacking user credentials
6	Hacking databases
7	MIDTERM EXAMINATION
8	Buffer Overflows
9	Powershell attacks
10	Exploits in Windows and Linux Systems
11	Physical security and social engineering
12	Evasion and post exploitation corrective measures
13	Persistence, Pivoting, and Data Exfiltration
14	Cloud and Cloud Attacks
15	REVIEW AND MIDTERM EXAMINATION

RECOMMENDED SOURCES	
Textbook	Weidman, Georgia (2014): "Penetration testing: A hands-on introduction to hacking". No Starch Press, Inc.. ISBN-13: 978-1-59327-564-8 Engelbreton, Patrick (2011): "The Basics of Hacking and Penetration Testing". Elsevier, Inc.. ISBN: 978-1-59749-655-1
Additional Resources	Baloch, Rafay (2015): "Ethical Hacking and Penetration Testing Guide". CRC Press, Boca Raton, FL, USA. ISBN 13: 978-1-4822-3162-5

MATERIAL SHARING	
Documents	Presentations and Laboratory Sheets
Assignments	Homework Sheets
Exams	Old exam questions are furnished

ASSESSMENT		
IN-TERM STUDIES	NUMBER	PERCENTAGE
Mid-terms	2	66
Quizzes	4	16
Assignment and Labwork	10	18
Total		100
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		60
Total		100

COURSE CATEGORY	Expertise/Field Courses
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N o	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Information Systems graduates have the knowledge and skills to design and develop complete systems for multimedia visual user interfaces. (ACM 262)					
2	Information Systems graduates have advanced knowledge and skills to design, develop and install the application systems for multimedia. (ACM365, 368,473)		x			
3	Information Systems graduates have the knowledge and skills to design, develop and apply algorithms and data structures to solve the basic problems of information processing, within the framework of discrete mathematics (ACM 221,222).					x
4	Information Systems graduates have the knowledge and skills to design and develop computer applications, based on user specified requirements, using modern structured development tools and install them on various hardware platforms and deploy their usage (ACM 311, 322).				x	
5	Information Systems graduates have the knowledge and the skills to design and develop computer applications, based on user specified requirements, using modern object-oriented development tools and install them on various hardware platforms and deploy their usage(ACM 321).	x				
6	Information Systems graduates know the logic of computer operating systems, the basic set of system commands, how to control access to system resources by users of different departments and how to monitor the running of jobs in the system (ACM 369, 370).					x
7	Information Systems graduates have the knowledge and the skills to design and develop data models serving different requirements, database applications that would access and process data using various types of software, including queries, reports and business applications.(ACM 211, 364)		x			
8	Information Systems graduates have the knowledge and the skills to design and develop business applications that would provide data access, modification and processing for data kept in enterprise database systems (ACM 221,364).					
9	Information Systems graduates have the knowledge about computer networks, and have the skills to design, develop and monitor computer networks, how to configure them and how to maintain their performance. (ACM 361, 362, 363, 463, 464)					x
10	Information Systems graduates have the knowledge and the skills to design and develop visual user interfaces for the web, web-based applications for n-tier client/server configurations, and how to deploy them in enterprises (ACM 365, 368, 412).					x

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Including the exam week: 15x Total course hours)	14	3	42
Hours for off-the-classroom study (Pre-study, practice)	14	5	70
Homework	10	10	100
Quizzes	10	1	10
Midterm	1	10	10

Final	1	10	10
Total Work Load			242
Total Work Load / 25 (h)			9.6
ECTS Credit of the Course			10