COURSE INFORMATION					
Course Title	*Code*	*Semester*	*T+P+L Hour*	*Credits*	*ECTS*
Cryptology and Cyber Security	CIS 520		3+0+0	3	10

Prerequisities	-

Language of Instruction	English
Course Level	Bachelor's Degree (First Cycle Programmes)
Course Type	Required
Course Coordinator	Asst. Prof. Dr. Mustafa Asım Kazancıgil
Instructors	
Assistants	
Goals	The goal of this course is to teach the students the cryptology methods and cryptography types used in the field of cybersecurity.
Content	Fundamentals of the cryptology methods and cryptography types used in the field of cybersecurity, modular arithmetic, cryptographic protocols, vigenere ciphers and linear ciphers, public key algorithm, RSA cryptography algorithm, prime numbers and substitution and shift cipher, Kerberos DC cryptography, inverse multiplication, extended Euclidean algorithm, comparative study of different cryptographic algorithms

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 Cryptography and Cybersecurity	
2	Introduction to Cryptography and Cybersecurity	
3	Modular Arithmetic	
4	Modular Arithmetic	
5	Cryptography Protocols	
6	Midterm Exam	
7	Vigenere Ciphers and Linear Ciphers	
8	Public key algorithm, RSA cryptography algorithm	
9	Prime numbers and substitution and shift cipher	
10	Kerberos DC cryptography Inverse Multiplication	
11	Extended Euclidean Algorithm	
12	Comparative study of different cryptographic algorithms	
13	Final Exam	

RECOMMENDED SOURCES

Textbook	Harriet Fell & Javed Aslam (2017): "Discrete Structures". Cognella Academic Publishing. ISBN-10: 1634876466. ISBN-13: 978-1634876469.
Additional Resources	

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

ASSESSMENT		
IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Mid-terms	1	30
Final	1	70
Total		**100**
Contribution of Final Examination to Overall Grade		70
Contribution of In-Term Studies to Overall Grade		30
Total		**100**

COURSE'S CONTRIBUTION TO PROGRAM							
No	Program Learning Outcomes	Contribution					
		1	2	3	4	5	
1	Information Security Technology graduates have the knowledge and the skills to design and develop complete systems for multi-media visual user interface.						
2	Information Security Technology graduates have advanced knowledge and skills to design, develop and install the application systems for multimedia.			x			

#	Program Outcome				
3	Information Security Technology 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.				x
4	Information Security Technology 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.			x	
5	Information Security Technology 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.	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.				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.		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.				
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.				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.			x	

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	**Quantity**	**Duration (Hour)**	**Total Workload (Hour)**
Course Duration (13 hours including exams)	13	3	39

Hours for off-the-classroom study (Pre-study, practice)	14	4	56
Midterm Exam	1	2	2
Homeworks	4	35	140
Final Exam	1	3	3
Total Workload			**240**
Total Workload / 25 (s)			**9.60**
ECTS Credit of the Course			**10**