



Course Syllabus  
1<sup>st</sup> Semester 2012/2013

<b>Course Title:</b> Information System Security <b>Course Number:</b> 1003480 <b>Prerequisite:</b> 1002281	<b>Assessment and Course Grade:</b> <ul style="list-style-type: none"><li>• First Exam 20%</li><li>• Second Exam 20%</li><li>• Final Exam 50%</li><li>• Programming Assignments (Homework) 10%, there will be about 2 assignments</li></ul>
<b>Instructor:</b> Dr. Ala Mughaid <b>Office NO:</b> IT 126 <b>Contact Info:</b> <a href="mailto:ala.mughaid@hu.edu.jo">ala.mughaid@hu.edu.jo</a> ,	
<b>Office Hours:</b> (Sun,Tuesday,Thursday) 11-12	

## Course Description

The OSI security architecture, security attacks, security mechanisms, symmetric ciphers, Classical encryption techniques, data encryption standards (DES), primary numbers, introduction to number theory, public-key cryptosystems, RSA algorithm, message authentication, digital signature, Hash function.

## Textbook

Stalling, W., "Cryptography and Network Security". 4<sup>th</sup> Ed., Prentic Hall,(2006)

## Additional Reading

- William Stallings, Network Security Essentials: Applications and Standards Prentice Hall, Hardcover, Published November 1999, ISBN 0130160938.
- Bruce Schneier and John Wiley, Secrets and Lies: Digital Security in a Networked World, Published August 2000, ISBN 0471253111

## Course Objectives

On successful completion of this course the students should be able to:

- Describe the risks of insufficient information protection and the need for computer security.
- Describe the threads posed to information security and discuss the more common attacks associated with those threats.
- Understand the principles and practices of cryptographic techniques.
- Compare and contrast symmetric and asymmetric encryption.
- Compare between substitutions, transposition ciphering techniques.

- Learning various data ciphering techniques.
- Apply appropriate security techniques to solve security problems.
- Implement practical security policies and describe how to assess their effectiveness.
- Explain the need of Hash functions and message authentication code.
- Describe the importance of Digital Signature in electronic documents and messages.

## Course Plan

Week no.	Topic	chapters
1	<b>Introduction:</b> Defining Security What is modern Cryptography Security Attacks Security Mechanisms.	
2 and 3	<b>Classical Encryption Techniques.</b> Symmetric Cipher model. Substitution Techniques. Transposition Techniques.	
4 and 5	<b>Block Ciphers and Data Encryption Standards.</b> Block Cipher Principles. The Data Encryption Standard. The strength of DES. Multiple Encryption and Triple DES.	
<b>First Exam</b>		
6	<b>Introduction to Number Theory</b> Prime Numbers. Fermat's and Euler's Theorem.	
<b>Programming assignment 1</b>		
7 and 8	<b>Public-Key Cryptography and RSA.</b> Principles of Public-key Cryptosystems. The RSA Algorithm.	
9	<b>Key Management</b>	
<b>Second Exam</b>		
10 and 11	<b>Message Authentication and Hash Functions.</b> Authentication Requirements. Authentication Functions. Message Authentication Codes. Hash Function.	
<b>Programming assignment 2</b>		
12 and 13	<b>Digital Signatures and Authentication Protocols</b> Digital Signatures Authentication Protocols. Digital Signatures Standard.	
14 and 15	<b>Hash Algorithm</b> Secure Hash Algorithm.	
<b>Final Exam</b>		