

## Liverpool John Moores University

Title: COMPUTER SECURITY  
Status: Definitive  
Code: **7003ESE** (120630)  
Version Start Date: 01-08-2016

Owning School/Faculty: Computer Science  
Teaching School/Faculty: Computer Science

Team	Leader
Kashif Kifayat	Y
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**Academic Level:** FHEQ7  
**Credit Value:** 20  
**Total Delivered Hours:** 36  
**Total Learning Hours:** 200  
**Private Study:** 164

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	12
Practical	12
Tutorial	12

**Grading Basis:** 50 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	AS1	Research and develop a solution for a contemporary computer security problem.	50	
Artefacts	AS2	Security tool development.	50	

### Aims

*To develop the knowledge of various security threats and vulnerabilities in computer systems as well as the importance of Computer Security.  
To critically assess a variety of generic security technologies for protection of*

computer systems.

*To promote the use of appropriate methodologies and tools in the analysis, design, implementation and management of secure systems.*

*To examine current research issues in Computer Security.*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Demonstrate advanced knowledge to identify and analyse particular security threats and vulnerabilities and assess their impacts on given computer applications.
- 2 Demonstrate advanced knowledge to specify appropriate security requirements for countering security problems identified for given applications.
- 3 Demonstrate a systematic and critical approach to a variety of security techniques and tools to develop appropriate security mechanisms and solutions for protection of computer systems.
- 4 Demonstrate advanced knowledge of current research issues and directions of computer security.

## **Learning Outcomes of Assessments**

The assessment item list is assessed via the learning outcomes listed:

Essay	1	4
Security Tool	2	3

## **Outline Syllabus**

*Fundamentals of computer security - Security concepts: confidentiality, integrity, availability and security policies. Security problems: security breaches and vulnerabilities. Information encryption and decryption: terminology, systems and applications. Risk analysis and security management: principles, techniques, processes and standards.*

*Personal computer security - Security problems. Security measures: file protection and password selection criteria. Computer attacks: examples, sources and prevention. Secure operating systems: security models and design issues.*

*Network security - threats to computer networks. Network security countermeasures: firewalls and intrusion detection systems. Mobile phone security, Wireless security: vulnerabilities, security services and protocols in the wireless environment.*

*Encryption and decryption - Crypto key management: protocols and services. Digital signatures: importance and methods. Authentication: principles, protocols and services. Network access controls: policies and mechanisms. Security applications: secure electronic payment protocols.*

*Database security: Data classification. Security requirements: integrity, authentication and authorization. Techniques for multilevel security: access control models, data encryption and architectures.*

## **Learning Activities**

Lectures, tutorials and advanced individual research. The individual research builds on core computer security concepts covered in the lectures through reading books, journals and conference papers in the area of computer security.

## **Notes**

This advanced course is intended for post-graduate students interested in the field of computer security. The purpose of the course is to provide the fundamental technical concepts and research issues essential for computer security. This module develops the understanding of threats to and the security requirements of computer systems, as well as tools and techniques to enforce security.