**Course Specification**

(IS 414 Information System Security)

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| **University:** | Helwan University |
| **Faculty:** | Faculty of Computers & Information |
| **Department:** | Information systems |

**1. Course Data**

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| --- | --- |
| **Code:** | **IS 414** |
| **Course title:** | Information System Security |
| **Level:** |  |
| **Specialization:** | Information systems |
| **Credit hours:** | 3 hours |
| **Number of learning units (hours):** | (2) theoretical (2) practical |

**2. Course Objective**

The course aims to provide a general introduction to Information Security Also background knowledge needed to study the subject area at an advanced level.

**3. Intended Learning Outcomes:**

1. **Knowledge and Understanding**

A10. Apply the principles of Information Technologies.

A20. Recognize Information Communication and Security techniques.

A25. Abstract Social subjects related to Information Systems.

1. **Intellectual Skills**

B10. Restrict solution methodology.

1. **Professional and Practical Skills**

C13. Develop an effective risk management plan and Detect safety aspects.

1. **General and Transferable Skills**

D9. Follow Logical Thinking in real time problem solving.

**4. Course contents**

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| --- | --- | --- | --- | --- |
| Week no. | Topic | No. of hr(s) | Lecture | Tutorial/Practical |
| Week 1 | Introduction: What is security (covering notions of Confidentiality, Integrity, and Availability)? | 4 | 3 | 2 |
| Week 2 | Security threats and risks. Security management (the DTI code of practice). The Data Protection Act. | 4 | 3 | 2 |
| Week 3 | *Elements of cryptography:* Ciphers (DES). Authentication codes (MACs). Public key ciphers and digital signatures (RSA). | 4 | 3 | 2 |
| Week 4 | *Access control:* Access Control Lists, capabilities, security label, role-based access control. | 4 | 3 | 2 |
| Week 5 | *Database security: The access path, views for security, integrity controls* | 4 | 3 | 2 |
| Week 6 | *Personal computer security: Viruses, restricting access.* | 4 | 3 | 2 |
| Week 7 | *Identity verification:* Use and storage of conventional passwords.Dynamic password schemes. | 4 | 3 | 2 |
| Week 8 | Biometric techniques. Use of tokens (dumb and intelligent), smart cards | 4 | 3 | 2 |
| Week 9 | Network security concepts: Security services and security mechanisms (as in ISO 7498--2).  Authentication and key distribution: Key management and entity authentication in a network. | 4 | 3 | 2 |
| Week 10 | Objectives of an entity authentication protocol.  Some fundamental protocols (e.g. Kerberos). | 4 | 3 | 2 |
| Week 11 | Using authentication protocols for key distribution, and other approaches to key establishment (including public key certificates and X.509). Firewalls | 4 | 3 | 2 |
| Week 12 | Security standards bodies: Introduction to roles of ISO, ITU, CEN, ETSI and BSI. The main roles of ISO/IEC SC21 and SC27 and a brief introduction to (security related) standards. | 4 | 3 | 2 |

**Mapping contents to ILOs**

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| --- | --- | --- | --- | --- |
| Topic | Intended Learning Outcomes (ILOs) | | | |
| Knowledge and understanding | Knowledge and understanding | Knowledge and understanding | Knowledge and understanding |
| Introduction: What is security (covering notions of Confidentiality, Integrity, and Availability)? | A10,A25 | B10 | C13 | D9 |
| Security threats and risks. Security management (the DTI code of practice). The Data Protection Act. |  | B10 | C13 | D9 |
| *Elements of cryptography:* Ciphers (DES). Authentication codes (MACs). Public key ciphers and digital signatures (RSA). | *A20,A25* | *B10* | *C13* | *D9* |
| *Access control:* Access Control Lists, capabilities, security label, role-based access control. |  | *B10* | *C13* | *D9* |
| *Database security: The access path, views for security, integrity controls* |  | *B10* | *C13* | *D9* |
| *Personal computer security: Viruses, restricting access.* | *A10* | *B10* | *C13* |  |
| *Identity verification:* Use and storage of conventional passwords.Dynamic password schemes. | *A20* | *B10* | *C13* | *D9* |
| Biometric techniques. Use of tokens (dumb and intelligent), smart cards | A25 | B10 | C13 | D9 |
| Network security concepts: Security services and security mechanisms (as in ISO 7498--2).  Authentication and key distribution: Key management and entity authentication in a network. |  | B10 | C13 | D9 |
| Objectives of an entity authentication protocol.  Some fundamental protocols (e.g. Kerberos). |  |  | C13 | D9 |
| Using authentication protocols for key distribution, and other approaches to key establishment (including public key certificates and X.509). Firewalls |  |  |  | D9 |
| Security standards bodies: Introduction to roles of ISO, ITU, CEN, ETSI and BSI. The main roles of ISO/IEC SC21 and SC27 and a brief introduction to (security related) standards. | A20 |  | C13 |  |

**5. Teaching and Learning Methods**

Lectures

Exercises

Lab Work (Unix security)

**6. Teaching and Learning Methods for students with limited capability**

Using data show

e-learning management tools

**7. Students Evaluation**

**a) Used Methods**

Written exams for the security concepts

Project

Security for a LAN

Internet Privacy Enhanced Mail (PEM).

Presentation

**b) Time**

Assessment 1 Week 3

Assessment 2 Week 5

**c) Grades Distribution**

Mid-Term Examination 20%

Final-term Examination 50%

Oral Examination. %

Practical Examination 20%

Semester Work and Project 10%

Other types of assessment %

Total 100%

**List of Books and References**

**a) Notes**

Course Notes

**b) Mandatory Books**

- D. Gollmann: Computer Security, John Wiley & Sons, 2nd Edition (Nov 2005) ISBN-10: 0470862939

- C.P. Pfleeger: Security in Computing, 2nd edition, 1997: ISBN-10: 0133374866

- Ross Anderson: Security Engineering, 2000: ISBN-10: 0470068523

- B. Schneier: Applied cryptography, 2nd edition, 1996: ISBN-10: 0471117099

**c) Suggested Books**

- W. Stallings: Cryptography and network security - principles and practice, 3rd edition, 2002, ISBN10: 0130914290 / 4th edition, 2006, ISBN-10: 0131873164

**d) Other publications**

**-** <http://www.sqlmag.com/>

**Course Coordinator:**  Dr. Mona Nasr

**Chairman of the Department:** Prof. Dr. Yehia Helmy