2024 / 25

School of Science and Computing

☎ +353 (0)51 302037

✉ Eleanor.Reade@setu.ie

🌐 www.wit.ie/schools/science_computing

SETU

Ollscoil
Teicneolaíochta
an Oirdheiscirt

South East
Technological
University

# Module Descriptor

# Information Security (Computing and Mathematics)

# Information Security (A26541)

**Short Title:** Info Security
**Department:** Computing and Mathematics
**Credits:** 10 **Level:** Postgraduate

## Description of Module / Aims

This module provides students with a solid grounding in the area of computer and information security. The question of securing modern distributed applications is treated holistically, where students assess security threats and vulnerabilities at different layers and identify suitable services and technologies to help address these threats. Cryptographic foundations that underpin many security mechanisms are covered in some detail, as well as best practices in secure software development. Students will also discuss incident handling and a selection of techniques and tools for forensic investigations.

## Programmes

| | | stage/semester/status |
|---|---|---|
| COMP-0973 | MSc in Computer Science (Enterprise Software Systems) (WD_KCESS_R) | 1 / 0 / E |

## Indicative Content

- Security threats: attack methods; common vulnerabilities; threat modelling; security services
- Cryptography: symmetric block and stream ciphers; public key cryptography; hash functions; authentication schemes; key management & certificates
- Network and cloud security: TLS; VPNs; wireless security; identity and access management; firewalls; intrusion prevention
- Software security: secure software development practices; OWASP Top 10; malware
- Security assessment: black and white box testing; penetration testing; standards, compliance
- Incident response & recovery: steps involved in incident response; the forensic process; data recovery; computer forensics

## Learning Outcomes

*On successful completion of this module, a student will be able to:*

1. Evaluate the various security threats and attacks to which an organisation may be susceptible.
2. Compare and contrast leading cryptographic techniques and determine their applicability in a variety of practical scenarios.
3. Assess key aspects of system, network and cloud security in a heterogeneous computing environment.
4. Evaluate the specific security concerns pertinent when developing and deploying software applications.
5. Carry out a security assessment on a modern distributed application.
6. Recommend incident response approaches and assemble digital evidence from a variety of sources.

## Learning and Teaching Methods

- Combination of lectures and guided computer-based practical exercises.
- Self-directed learning.

## Learning Modes

| Learning Type | F/T Hours | P/T Hours |
|---|---|---|
| Lecture | 24 | 24 |
| Practical | 24 | 24 |
| Independent Learning | 222 | 222 |

## Assessment Methods

| | Weighting | | Outcomes Assessed |
|---|---|---|---|
| Final Written Examination | 50% | | 1,2,3,4,6 |
| Continuous Assessment | 50% | | |
| Assignment | | 20% | 1,2,3 |
| Assignment | | 20% | 4,5 |
| Assignment | | 10% | 6 |

## Assessment Criteria

*<40%:* Unable to interpret and describe key concepts of the specific knowledge domains of computer security.

*40%–59%:* Able to interpret, describe and discuss key concepts of the specific knowledge domains of computer security. Able to discover and integrate related knowledge to assess and implement security approaches.

*60%–69%:* Able to solve problems within the specific knowledge domains by experimenting with the appropriate skills and tools.

*70%–100%:* All the above to an excellent level. Be able to propose solutions to a high standard for a range of both complex and unforeseen problems through the use and modification of appropriate skills and tools.

## Essential Material(s)

- "Open Web Application Security Project (OWASP)." https://www.owasp.org/
- "The SANS Institute." https://www.sans.org/

## Supplementary Material(s)

- McGraw, G. *Software Security: Building Security In.* Boston: Addison-Wesley, 2006.
- Stallings, W. and L. Brown. *Computer Security: Principles and Practice.* 4th ed.. Harlow: Pearson, 2018.