

## Operating Systems and Networking

### Security and network

#### IDENTIFICATION

CODE : IFA-4-S2-EC-SERE  
ECTS : 2.0

#### HOURS

Lectures : 12.0 h  
Seminars : 4.0 h  
Laboratory : 12.0 h  
Project : 0.0 h  
Teacher-student  
contact : 28.0 h  
Personal work : 30.0 h  
Total : 58.0 h

#### ASSESSMENT METHOD

1h30 exam; written documents and copy of the lecture slides are authorized.

Written and/or oral evaluation of the labs.

#### TEACHING AIDS

Lecture slides.

#### TEACHING LANGUAGE

French

#### CONTACT

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#### AIMS

Design and implement a security policy.

Analyze threats and vulnerabilities of a system.

Design and implement a security architecture.

Adapt security policy and enforcement architecture to new threats raised by emerging technologies (clouds, mobility, ubiquity, P2P, IoT...).

Leverage new technologies to design and implement reliable and secure distributed applications and systems.

Note: the network and security administration is mainly addressed in the PLD IF-4-SMART.

#### CONTENT

Lectures:

- Methodologies of risk assessment; security policy modeling; typology of threats and attacks.
- Techniques and protocols of encryption, steganography, authentication, signature, and certificates.
- Architecture, functionalities, and implementation of firewalls; address translation, packet filtering, intrusion detection.
- Access control models. Introduction to trust and reputation.
- Architecture, functionalities, and implementation of VLAN, VPN, IPsec, DLP.
- Scientific and technological challenges.

Labs:

- Cryptography.
- Firewall.
- Case studies on the askcypert.org platform.

#### BIBLIOGRAPHY

Introduction to Security, 9th Edition. R. Fischer and E. Halibozeck.

Applied Cryptography: Protocols, Algorithms, and Source Code in C. Bruce Schneier.

The Fundamentals of Network Security. John E. Canavan.

#### PRE-REQUISITE

IFA-3-RE