

Network Security

Lecturer

Jean-Michel DRICOT (Coordinator)

Course mnemonic

ELEC-H504

Language(s) of instruction

English

Course period

Second term

Campus

Solbosch

Course content

By the end of this course, students will be able to:

- Explain concepts related to applied cryptography, including plaintext, ciphertext, symmetric cryptography, asymmetric cryptography, and digital signatures.
- Experience the implementation and network standards behind the security of different cryptographic algorithms.
- Analyze and implement common network vulnerabilities and attacks, defense mechanisms against network attacks, and cryptographic protection mechanisms.

Objectives (and/or specific learning outcomes)

Provide a solid understanding of the design and analysis of network security architectures, protocols, and services. Most of these protocols are based on cryptographic primitives and can be used as building blocks for more sophisticated networked systems. During the course, we will perform an in-depth coverage of today's network security standards, their functionality and limitations e.g., SSL/TLS, Kerberos, IPsec, Radius, IEEE 802.1x, WPA, etc. Furthermore, the students will acquire a practical knowledge and experience in deploying, configuring, and analyzing current network security tools and protocols.

We will also discuss recent trends in network security attacks, and cyber-attacks in general, and analyze variety of attacks with in mind the legal, technology, and society impacts.

Pre-requisites and co-requisites

Course having this one as pre-requisit

INFO-Y122 | Security Analysis: from audits to red teaming | 5 crédits

Teaching method and learning activities

Slides with a copy send to the students before the cursus.

Seminars with speakers from the industry and security experts.

The course has a substantial hands-on component. In addition to the conceptual problem sets, each team of students is required to perform several laboratory assignments in a laboratory environment.

References, bibliography and recommended reading

William Stallings. *Cryptography and Network Security (8th Ed)*. Prentice Hall Press, 2023.

Course notes

Université virtuelle

Other information

Place(s) of teaching

Solbosch

Contact(s)

Jean-Michel Dricot (jean-michel.dricot@ulb.be)

Evaluation method(s)

Project and Personal work

Evaluation method(s) (additional information)

Open book written examination: several questions on each chapter, one small numerical application and questions on a technical recent paper (issued by a supplier, a telco or a Forum) given before the examination.

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the Brussels School of Engineering

MA-IREL | Master of science in Electrical Engineering | finalité electronics and information technologies/unit 2

Programmes proposing this course at the faculty of Sciences

MA-SECU | **Master in cybersecurity** | finalité Cryptanalysis and Forensics/unit 1 and finalité Corporate Strategies/unit 1

