EuroTeQ Engineering University

Course

Part of the EuroTeQ course catalogue spring/summer 2023

Network Security

Subject area: Computer Science/ICT

University:	L'X
Level:	MA1, MA2
Teaching mode:	completely online, not time-specific
Instructor(s):	Thomas Heide Clausen

Short description

Threats and attacks are like living organisms: some survive unaltered, mostly hidden from view, but remain deadly when conditions are “just right” ; others emerge quickly, wreck havoc, then become extinct — and yet others keep evolving, both in terms of their propagation methods and their impact.

Full description

A network professional can therefore not be limited to just static application of risk assessment methodology, nor to mechanical application intrusion detection and forensics tools — and must, by nature, not simply be “following a cookbook”, but must also have a complete understanding of the whole processes, technologies, and theories involved in attacks.
This program in network security is therefore not just limited to a theoretical understanding the state of the art of security standards, threats, and techniques— but tries to bring a broad systems-understanding, to be able to be proactive and identify potential attack surfaces of a system, before an attack exists, and the necessary background to be able to rapidly analyse and understand the root nature of a new attackon a system.
The objectives of this program is to allow students to:
• Not just to understand “This is an attack, and here is how to detect it”, but also to understand “What architectural choices have made this attack even possible?”. This, so as to ensure that graduates can:
- Go beyond just mechanically replicating recipes from a catalogue for “evaluation-detection-countermeasures”
- When developing a system, make appropriate, security-informed, architectural choices

• Distinguish between “science-facts”and “science-fiction”, when listening to security solution vendors, reading popular press, etc.
• Understand, analyse, and exercise critical appreciation of, the panorama of current known techniques for:
- Risk Evaluation
- Systems and Network Protection
- Intrusion Detection
- Forensics and Recovery

• Practice setting up secure networks, including the usage of techniques such as VLANs, VPNs, DMZs, IDSes (Snort, Suricata), Firewalls, etc.
The course will be available asynchronously, fully on-line, or on-site, through learning flows with short videos, quizzes, homework, lab exercises.

Learning outcomes

This course will provide students with a fundamental understanding of both the “vulnerabilities” that are present in the Internet infrastructure, as well as the tools, methods, and architectures that network- and cybersecurity professionals apply to protect against attacks.

General information

Contact hours per week:	4 hours
Total workload:	40 hours + personal work (in student hours for the whole course)
ECTS credits:	5
Language:	English
Course start date:	03 January 2023
Course end date:	03 June 2023
Add. info about start date:	Individualised, can be any date, between Jan 3 and April 1, 2023. Please note that the intended start-date must be communicated to Ecole Polytechnique at the time of registration. The course end date should be exactly 10 weeks after the start-date.
Weekly teaching day/time:	Available fully asynchronous
Time zone:	CET (Denmark, Germany, France, Netherlands, Switzerland, Czech Republic)
Further information:	Interested EuroTeQ students are welcome to, at any time, to come discuss their course choices in chat, or in visio, with the instructors from Ecole Polytechnique who will be teaching the classes. To this end, a dedicated WebEx space is permanently available here: https://eurl.io/#fCk0f6iWF.
Prerequisites:	Any “introduction to networking” course
Activities and methods:	The course will be available asynchronously, fully on-line, or on-side, through learning flows with short videos, quizzes, homework, lab exercises / tutorials — as well as office-hours via Webex with professors and instructors. While being asynchronous, each student is expected to check in with an instructor over Webex, weekly, following the chosen start-date.
Presence on campus:	no

Final examination

Form:	Final exam, weekly quizzes, graded assignments
Date:	
Location/format:	online
Re-sit possibility:	no
Transcript available:	end of the semester and generally 8 weeks after the exam.
Add. info/requirements:	

Registration

To register for this course, follow the registration requirements of your **home university** as specified here: www.euroteq.eu/courses-registration.

Administration

Number of places:	24-30
Minimum participants:	
Internal course code:	
Contact:	euroteq-mobility@polytechnique.fr

This course is part of the EuroTeQ Engineering University joint course catalogue 2023. This is a collaborative activity of the partner universities DTU, L'X, TU/e, TalTech, CTU, TUM as well as Technion. Students from these universities can participate in the offered courses. It is the responsibility of the student to check if you fulfil the requirements to participate in a specific course. Students are also advised to check with their home institution how to get recognition of the ECTS credits gained in courses of the EuroTeQ course catalogue. For further information about EuroTeQ Engineering University, visit www.euroteq.eu or get in touch with the above-mentioned point of contact.