

TELECOM Nancy

Ingénieurs du numérique • Inspiring your digital future

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INTERNET SYSTEMS AND SECURITY

INTERNET, SYSTÈMES
CONNECTÉS ET SÉCURITÉ



UNIVERSITÉ
DE LORRAINE

LORRAINE
INP



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INTERNET SYSTEMS AND SECURITY

TELECOM Nancy is the School of Engineering in Computer Science of the Lorraine INP Collegium at the University of Lorraine. Member of the Mines-Télécom Institute association, TELECOM Nancy is a public engineering school working at the very heart of IT and digital sciences.



Launch Event of TELECOM Nancy's Professional-Grade Cyber-Range

Over a 3-year period, its goal is to train « **digital engineers** » and scientists: women and men involved in the future, developing both profession-specific expertise directed towards progress and opportunities, as well as an awareness to and knowledge of the business world. **The curriculum integrates a specialized Major on cyber-security.**

Recruitment takes place as from BAC + 2, equivalent to 2 years of post A-Level study (main recruitment - enrolment into the 1st year) and BAC + 4, equivalent to a post-graduate degree (enrolment into the 2nd year).

Since 2017, TELECOM Nancy has acquired a top-level cyber-security technological platform, composed of three main rooms (red team, blue team, datacenter) complemented by a professional-grade cyber-range, and interconnected to other cutting-edge platforms (healthcare, industry, transportation...).

A 3-YEAR ACADEMIC PROGRAM

The academic program can be followed under the **student or apprentice status** (1, 2 or 3 years of apprenticeship):

- **3 semesters of general curriculum** including fundamental sciences, technology, economic, social and human sciences as well as foreign languages.
- **3 semesters in a specialized Major.**

Training conducted by world-class scientists and professors from major research laboratories (LORIA, INRIA, CRAN, IECL, CNRS, **High Security Laboratory**) and by many professionals working in Computer Science and Cyber-Security (network security, malware, cryptography, protocol verification, secure coding...).

The curriculum includes a general course on **cyber-security and best practices** followed by all the students of TELECOM Nancy.



5 MAJORS STARTING IN THE 2ND YEAR

- Big Data Engineering and Applications
- Enterprise Information Systems
- **INTERNET SYSTEMS AND SECURITY**
- Software for Embedded Systems
- Software Engineering

OUTLINE: INTERNET SYSTEMS AND SECURITY

Backbone of communications amongst objects, humans, companies, and administrations, the **Internet** is a great integration platform capable of efficiently interconnecting billions of entities, from RFID chips to data centers but also increases the exposure to security threats.

This **specialized major on cyber-security** aims at designing, maintaining and protecting elaborated services built over this integration platform.

Mastering the Internet and its services, composed of heterogeneous and constantly evolving connected systems, with strong performance and **security requirements**, is an essential skill for companies and organizations.

It constitutes a major leverage for their competitiveness and growth, through the design and maintenance of value-added services that are **protected** and **resilient** against a wide range of security attacks.

PROGRAM OBJECTIVES

INTERNET SYSTEMS AND SECURITY

To strengthen theoretical knowledge:

- Software design and defensive programming
- Cryptography and data protection
- Modeling and verification of security protocols
- Resilience and scalability of systems
- Security methodologies and regulations

To acquire advanced technological skills:

- Internet, network protocols and services
- Analysis of attacks, ethical hacking, and pentesting
- Protection and defenses of networks and applications
- Distributed systems, cloud computing, and internet-of-things
- Malwares, viruses and reverse engineering
- Monitoring, orchestration and security management
- Forensics and responses to security incidents

To develop close ties with companies:

- Courses given by **international leading experts** from industry and services (digital forensics, security management, secure software programming...)
- Practical use cases experimented over our cyber-security technological platform, including a **professional-grade cyber-range**



CAREERS

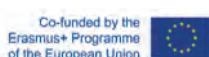
- **Security Architect / Integrator / Designer**
- **Analyst / Consultant in Cyber-Security**
- **Security Auditor, Expert in Pentesting**
- **Expert in Digital Forensics**
- **Chief Information Security Officer**
- **Research Engineer in Cyber-Security**

EXAMPLES

- **As Cédric, become a security analyst in the Defence and Space division of a major European aerospace group.**
- **As Rita, join the cyber-security teams of the major world specialist of smart card manufacturing.**
- **As Maxime, be an expert in penetration testing for international banking and financial institutions.**

RECOGNIZED EXCELLENCE IN CYBER-SECURITY

- Student teams in the **top 5 of several national and european cyber-security challenges** (TRACS, GreHack, DGHack, UniBW CTF...)
- **Discovery of security vulnerabilities** by students on common software products (Facebook Messenger, Oracle MySQL, Suricata IDS, Google Rewards...)
- Organization of **cyber-security events** for specialist and non-specialist audience (cyber escape game, annual CTF, Hackathon, Cyber Humanum Est)
- Coordination and/or participation to several **MOOCs** in cyber-security (network and service management, network security, becoming a cyber-security consultant)
- Participation to several **European competence networks / skills alliances** (EU Concordia, Erasmus+ Rewire...), student exchange programs in cybersecurity, strong relationships with the French Ministry of Armed Forces (COMCYBER).
- A **strong alumni network** in cyber-security, including Renaud Lifchitz, ranked amongst the **top 100** most influent french IT experts worldwide.



SPECIFIC INTERNET SYSTEMS AND SECURITY MAJOR COURSES IN 2ND AND 3RD YEAR AT TELECOM NANCY



2ND YEAR

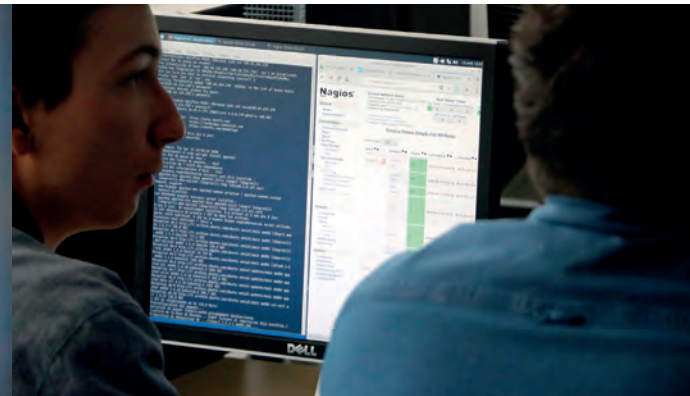
- Cryptography et Authentification
- Security of Applications and Secure Coding
- Cyber-Security Methods, Regulations and Organization
- Information Theory and Data Resilience
- Introduction to Ethical Hacking
- Advanced Networks and Systems
- Digital Forensics and Responses to Incidents
- Monitoring and Orchestration for the Cyberspace

3RD YEAR

- Advanced Cryptography
- Malware and Reverse Engineering
- Security of Networks and Services
- Security Protocols and Verification
- Applied Penetration Testing
- Management of Cyber-Security
- Mobile Applications and Internet-of-Things
- Cloud Computing: Opportunities and Risks
- Big Data for Cyber-Security

DEFENSIVE ROOM

TELECOM Nancy
SALLE DE CYBERSÉCURITÉ AVEC LE SOUTIEN D'AGEFOS PME



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UNE OFFRE DE FORMATION DE
RÉFÉRENCE EN CYBERSÉCURITÉ,
UNIQUE DANS LE GRAND EST,
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