MASTER OF SCIENCE: COMPUTER SCIENCE for NETWORKS (CSN)

Want to understand, analyze and improve your communication network?
Want to develop and define software on top of next-generation networks?

This **M.Sc. in Computer Science for Networks (CSN)** helps students acquire advanced techniques and specialized tools with deep studies to computer science and complex networks. The master CSN combines recent approaches based on advanced software engineering towards networks.

This program focuses on rigorous coursework, technical training, specialized research, and expert faculty mentorship.

The MSc CSN emphasizes research preparation and experience being a chance to lay the groundwork for pursuing a PhD, as well as leading to research engineer positions in academic or industrial organizations.

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www.telecom-sudparis.eu

Institut Mines-Telecom

Objectives

The Master of Science CSN is specifically designed to prepare graduate students for a variety of careers in computer science and networks. Its key strength is the array of cross-disciplinarily between research, software, networks and systems advanced training.

Taught by faculties from top-tier institutions, with international renowned research labs, and within the wider tech industry of the Paris area region, students can expect a rigorous curriculum, to be intellectually challenged with thorough coursework and discover academically minded peers and faculty mentors through team-driven projects.

The CSN program combines both software engineering and network domains. It enables students to increase their broad-based knowledge in their field while focusing on curricular concentrations selected from a range of options including machine learning, programming languages, complex systems, security, virtualization, wireless communication, validation, algorithmic, complexity, software defined networks, internet of things, simulation. The curriculum allows the students to explore key contextual areas or more complex technical research applications through exciting research or industrial projects.

In addition to the research, practical and technical coursework, in collaboration with Institut Mines-Télécom Business School, Entrepreneurship courses and French language and Culture modules are proposed to the students.

Finally, each student will prepare a 6-months master's thesis. The thesis can be conducted in collaboration with industrial partners or research laboratories.

Career Perspectives

The Master CSN leads to research (in research institutes or universities) and industrial engineering positions in the diverse fields of computer science dedicated to networks and communication systems. Program graduates will be well positioned to attain research and development positions in rapidly growing fields or to progress into doctoral-degree-related fields. The domains the students will be able to use their learned skills, knowledge and expertise on are numerous, such as modelling and complex networks analysis, distributed computing for new-generation communicating systems, qualitative and quantitative studies. Leading then to positions such as research engineer, system analyst, quality engineer, consultant. Most of our students find a position before graduation.

Target students

Recent graduates with a Bachelor's degree or equivalent level having an exceptional academic record, as well as engineers and professionals who wish to upgrade their knowledge can apply for the MSc CSN either to the 1st year or the 2nd year (if 60 credits already obtained from previous master equivalent studies). Students who graduate from the two-year program, taught in English, will receive the Master's degree from Telecom SudParis.

Program

Lectures taught in English.

The curriculum for this four-semester program is as it follows:

First year (60 ECTS)
Semester 1 (30 ECTS):
Core courses:
- C Programming and Unix
- Probability and Statistics
- Networks
- Research project
- French Language and Culture

Elective courses:
- Optimization
- Introduction to Information Theory
- Internet of Things and Data Analytics
- Introduction to Machine Learning
- Low-level data management

Semester 2 (30 ECTS)**:**
- Principles of Relational Data Management
- Principles of Distributed Data Management
- Software and Data Engineering
- Network programming
- Advanced data networks
- Engineering for quality of service
- Performance Evaluation and Metrics
- Distributed Computing Systems
- Effective communication essentials
- Entrepreneurship
- French Language and Culture

Second Year (60 ECTS)
Semester 1 (30 ECTS) – Core and Elective courses**:**
- Simulation and Metrology
- Virtualization: Concept and implementation
- Dynamic Systems, autonomous and self-adaptative
- Network Security and Privacy
- Network Science and Graph Learning
- Wireless network and IoT
- Centralized/Cloud-Based Radio Access Networks
- Middleware for distributed Applications
- Formal System Testing
- Software Model based Testing
- Global Laboratory for Industry-Driven Software Development
- Computational logic
- Algorithm analysis and Computational Complexity
- Software Defined Networks
- Machine Learning for Computer Networks and Services
- Formal Verification
- Algorithms for dynamic and reconfigurable distributed systems

Semester 2 (30 ECTS)**:**
- Master Thesis (paid internship)

Program directors:

M1 1st Year:
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