le cnam

International Master (Initial training) - MR11601D
Artificial Intelligence for Connected Industries

Introduction
- Language of instruction: English.
- Mode of learning: daytime, full time, on-site and remote classes.
- Length: M1: 1 year, M2: 1 year, M1+M2: 2 years.
- Official title appearing in the degree: "Master Sciences, technologies, santé - mention Informatique", meaning Master of Science, Technologies and Health - track in Computer Science.
- French Ministry habilitation: Arrêté du 28 janvier 2019, Ministère de l'Enseignement Supérieur, de la Recherche et de l'Innovation.
- Master website: **ai4ci.roc.cnam.fr**

Program's presentation
The Master program takes place at Conservatoire national des arts et métiers (Cnam), Paris downtown, France, in the heart of the Ville Lumière (the City of Light), Marais district, in a vibrant multi-cultural international and stimulating environment.

The Master program covers:
- advanced artificial intelligence technologies applied to networked systems and robotics;
- advanced technologies related to the design IoT computing systems, protocols and applications;
- novel network architectures emerging with network virtualization (NFV), edge computing (MEC) and softwarization (SDN, SD-x);
- modeling and performance evaluation of networks and computing systems, including 5G and beyond 5G systems;
- integration of artificial intelligence and novel decision-making frameworks for the operations and automation of communication networks and IoT Systems.

The Program's faculty body includes world-class academics and industry experts. They participate actively in various areas such as: international, European and national collaborative projects, industrial research projects (H2020, ANR), standardization and open-source bodies (ONF, IETF, ETSI) etc.
Lecturers are also active researchers and engineers, who contribute significantly with standards, open source projects, scientific articles and publications to the contents of the Master program.

Scholarships and travel grants available based on excellence criteria.

Objectives and Skills Learned
The Master program is meant for students willing to become expert of digital infrastructure technologies, going from network and Internet/cloud infrastructures to edge computing and IoT systems and applications.
Students attending the Computer Networks and IoT Systems Master program will learn and experiment current and novel technologies underpinning the Internet infrastructure, related to Network Virtualization, Internet-of-Things (IoT) protocols and architectures, IoT device design, Artificial Intelligence and Machine Learning integration in network and embedded systems, Software-Defined-Networking, Cloud Networking, 5G and beyond-5G architectures – a set of novel technologies driving the digital society evolution.

Admission requirements
International, extra-European and European students willing to pursue a Master degree program in English, and possessing a Bachelor-level degree in one of following fields: Computer Science, Electronics, Computer Engineering, Electrical Engineering, Software Engineering, ICT Engineering.
Admission is also possible at the M2 (2nd year level) if you can justify 4 years of university study in one of the fields mentioned above with equivalent M1 (1st year) courses.

Application:
- 2-page curriculum vitae (CV);
- copy of Bachelor degree, and Master degree (if any);
- transcripts of grades of all previous degrees;
- signed motivation letter indicating if asking admission at the M1 or M2 level, and asking for scholarship;
- English certificate equivalent to B1 for M1 (1st year), B2 for M2 (2nd year), according to the CEFRL (Common European Framework of Reference for Languages);
- coordinates (email, telephone, address) of two reference professors.

Students coming from outside the European Union have to apply via Campus France :
https://www.campusgrance.org
Online application is possible via the «Études en France» platform :
https://pastel.diplomatie.gouv.fr/etudesenfrance

More details on the application procedure:
ai4ci.roc.cnam.fr

International Master Artificial Intelligence for Connected Industries (Initial training)

First/second year program (M1/M2)

M1 Program		
Code	Course title	ECTS
USEEN6	Artificial Intelligence and Machine Learning for Connected Systems	6
USEEN3	Operations Research	4
USEET3	Parallel and Distributed Systems	6
USEEN2	Operating Systems and Computer Architecture	6
USEEK7	Network Security	6
USEES2	Automatics	4
USEES3	Distributed and Federated Learning	5
USEEJ8	Wireless Mobile Networks	6
6 ECTS to choose:		
USRS2H	Refresh in programming languages	3
USEES5	Sustainable IoT Architectures	3
USEES6	Next Generation IEEE 802.11 standards	3
USEES7	Data Management and Digital Transformation in Industrial Process Automation	3
USEES8	Big Data Technologies for Connected Industries	3
USEES9	Robot Predictive Maintenance	3
USRS78	Advanced Python Programming	3
USEET1	Integration of Virtual and Augmented Reality Technologies in Connected Industries	3
11 ECTS to choose:		
USEES4	Intelligent Process and Factory Control	3
USEET2	Complex Networks: Data Analysis and Network Science	4
USEEJ7	Networks - Complements and Applications	6
USEEJ6	Network Architecture	6
USEEN1	Computer Systems Modeling and Verification	6
USEET4	Peer-to-Peer Systems and Blockchain	5
USEET5	Datacenter Design and Operations	5
USEEK2	Scientific Communication I	2
USEEK3	Contemporary Economic Issues	3
USEET6	Seminars from the Industry	3
USEET7	Ethics and Sovereignity of Digital Infrastructures	3

M2 Program		
Code	Course title	ECTS
USEET8	Reinforcement Learning	3
USEET9	Learning Robots	3
USEEU1	Robot Operating Systems	3
USEEN4	Network Virtualization and Automation	6
USEEK8	Advanced Experimental Projects on Connected Systems	6
9 ECTS to choose:		
USEEW1	Business Process Modeling	3
USEEW2	Advanced Automation of Industrial Processes and Services	3
USEEU4	Advanced Programming	9
USEEW3	Industrial Internet of Things	6
USEEU5	Algorithm Engineering and Data Structures	9
USEEN5	Embedded Systems: Applications and Cybersecurity	6
3 ECTS to choose:		
USEEU6	Applied Artificial Intelligence	3
USEEU7	WiFi and 5G Convergence in 6G	3
USEEU8	Smart Industry 4.0 Systems	3
USEEU9	Green AI Computing for Connected Industries	3
USEEV1	Communications for Precision Agriculture and Farming	3
USEEV2	Applications of AI and Cyber-threat Management	3
USEEV3	Programming and Communication of a Robotic Arm	3
USEEV4	AI4CI Activities: from research to business	3
USRS78	Advanced Python Programming	3
USEEV5	FPGA Platforms: Programmable Embedded Systems	3
6 ECTS to choose:		
USEEJ9	FLE - French as foreign language	6
USEEK1	English	6
USEEU6	Applied Artificial Intelligence	3
USEEU7	WiFi and 5G Convergence in 6G	3
USEEU8	Smart Industry 4.0 Systems	3
USEEU9	Green AI Computing for Connected Industries	3
USEEV1	Communications for Precision Agriculture and Farming	3
USEEV2	Applications of AI and Cyber-threat Management	3
USEEV3	Programming and Communication of a Robotic Arm	3
USEEV4	AI4CI Activities: from research to business	3
USRS78	Advanced Python Programming	3
USEEV5	FPGA Platforms: Programmable Embedded Systems	3
UAEE2B	Master thesis - Internship	21

Calendar
• Registration: till end of June
• Visa: till end of July
• Arrival: till end of September
• Start of classes: October
• End of classes: June

Fees
• For extra-European students: 3 879 € per year
• For European students : 250 € per year
Your employer or a sponsoring company can cover the registration fees.
Scholarships covering tuition fees and/or living expenses can be attributed to outstanding students.

Courses (examples)
• Internet routing architecture
• Internet of Things (IoT)
• IoT device system design
• Artificial Intelligence and Machine Learning
• Cybersecurity architectures
• Network security
• Wireless and mobile networks
• Network Functions Virtualization
• Network Automation
• Software Defined Networking
• 5G and 6G architectures

Career opportunities
• Computer Scientist
• Network engineer
• IoT engineer
• Computer Systems Engineer
• Internet Engineer
• Network Expert
• Embedded Systems Engineer
• Expert Consultant in Computer Networks and Systems

Corporate partners/employers (examples)
• Orange
• SFR
• OVH
• Nokia
• Thales
• Huawei Technologies France
• Ericsson
• SQUAD
• Gandi

Depuis décembre 2021, le Cnam est certifié Qualiopi pour l'ensemble des entités de formation de l'établissement public, et pour les quatre types d'actions couvertes par cette certification :

le cnam

Qualiopi processus certifié

RÉPUBLIQUE FRANÇAISE

La certification qualité a été délivrée au titre des catégories d'actions suivantes :
ACTIONS DE FORMATION
BILANS DE COMPETENCES
ACTIONS DE VALIDATION DES ACQUIS DE L'EXPERIENCE
ACTIONS DE FORMATION PAR APPRENTISSAGE

mission Handi cnam

Helping students with disability: :
handi.cnam.fr

Co-funded by
European Commission
(contract nb: 101123524)

Co-funded by the European Union

ai4ci.roc.cnam.fr

Le Cnam
EPN5 – Computer Science Department
2, rue Conté
75003 Paris - France
Office 33.1.9A

Contact

Hamida Mmadi,
Administrative contact
+33 1 40 27 28 21
master-roc@cnam.fr

Dircom Cnam - BP/LI - Juillet 2024 © Alatack, L. Benoit.