

International students enrolled in the ECE Exchange Programs can select **English taught** courses from the following **Engineering Program Majors** :










- Data Science & AI Major
- Energy & Environment Major
- Embedded Systems Major
- Cybersecurity Major

Students can also select **French taught courses** from the following **Engineering Program majors**:

- Majeure CReATE (Conceptions, Realizations Applied to Emerging Technologies)
- Majeure Santé & Technologie
- Majeure Cloud Engineering & Management
- Majeure Véhicule Connecté & Autonome
- Majeure Finance & Ingénierie Quantitative

**Please, keep in mind, that courses indicated in this catalogue are subject to change.**

Please be aware that all classes are conducted at the Master's level. Additionally, courses from different programs cannot be combined. Enrollment in specific programs and courses will be determined by students meeting prerequisites and availability.

LANGUAGE OF INSTRUCTION	MAJOR - MAJEURE	COURSE DATES - M1	COURSE DATES - M2	EXAM PERIOD
	DATA & AI MAJOR	SEPTEMBER 1, 2025 TO DECEMBER 12, 2025	SEPTEMBER 8 TO DECEMBER 12 2025	DECEMBER 15 TO DECEMBER 19, 2025 (RETAKES IN JANUARY)
	ENERGY & ENVIRONMENT MAJOR			
	EMBEDDED SYSTEM MAJOR		CLOSED	
	CYBERSECURITY MAJOR		SEPTEMBER 8 TO DECEMBER 12 2025	
	MAJEURE CReATE			
	MAJEURE SANTÉ & TECHNOLOGIE			
	MAJEURE CLOUD ENGINEERING & MANAGEMENT			
	MAJEURE VÉHICULE CONNECTÉ & AUTONOME		CLOSED	
	MAJEURE FINANCE & INGÉNIERIE QUANTITATIVE		SEPTEMBER 8 TO DECEMBER 12 2025	

## ABOUT

### > THE FIVE-YEAR ENGINEERING JOURNEY AT ECE

The ECE engineering program follows the **French grande école structure over five years**, divided into two cycles:

- **The Preparatory Cycle (Years 1-2)** lays a strong foundation in science and technology through project-based learning.
- **The Engineering Cycle (Years 3-5)** focuses on advanced specializations.

For exchange students, **courses are available only in the Fourth and Fifth Years (Master's level)**, providing opportunities for high-level specialization and international collaboration.

### OUR ENGINEERING PROGRAM & OUR YEARS OPEN TO EXCHANGE STUDENTS

FIFTH YEAR - ENGINEERING CYCLE  
OPEN IN FALL TO EXCHANGE STUDENTS

M2

FOURTH YEAR - ENGINEERING CYCLE  
OPEN TO EXCHANGE STUDENTS

M1

THIRD YEAR - ENGINEERING CYCLE

B3

SECOND YEAR - PREPARATORY CYCLE

B2

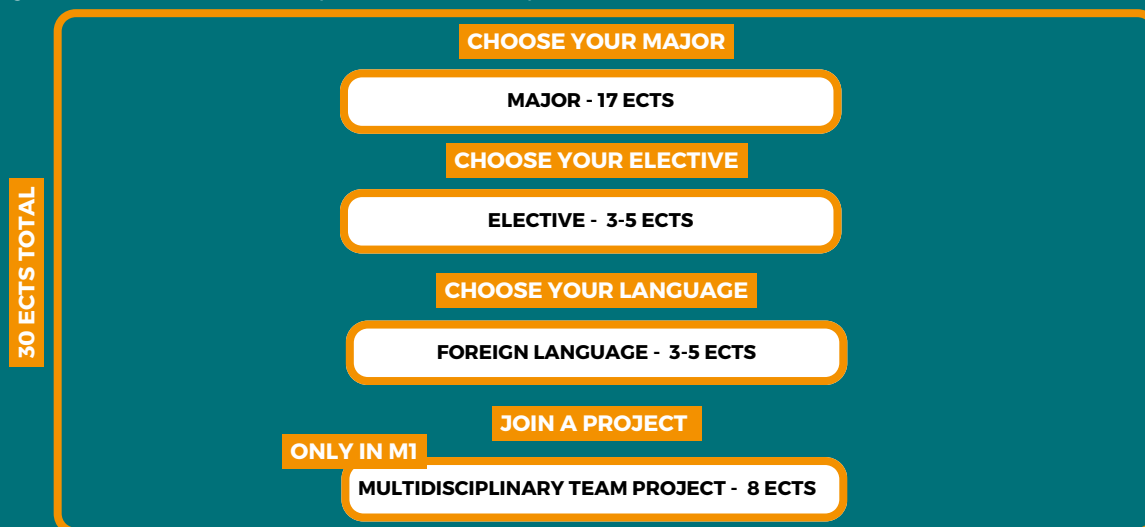
FIRST YEAR - PREPARATORY CYCLE

B1

## THE FREEDOM TO CHOOSE YOUR PATH

At ECE, each student **chooses freely their path according to their tastes, personal aptitudes and professional project.**

ECE is the school of 1001 possible paths – no path is identical, our students are all different. We give our students the building blocks to build the path of their dreams, the path that resembles them and that will best guide them towards their professional and personal ambitions.



### WHY SELECTING A MAJOR?

**In the second or third year of the engineering program (M1 & M2), students can select one technology major. Once admitted, they will follow a dedicated curriculum within this specialization, typically earning 17 ECTS credits.** This approach allows students to gain in-depth expertise in their chosen field while also fostering a well-rounded understanding of information technologies.

### WHY CHOOSING AN ELECTIVE ?

**Each semester, students can choose up to two electives from a selection designed to actively prepare them for their professional goals.** Through this approach, they acquire crucial skills that will shape their careers.

### LANGUAGES

**While the "Grande École" engineering programs in France are traditionally taught in French, we at ECE are committed to fostering an international perspective. For our international exchange students, this means an opportunity to immerse themselves in a multicultural environment while expanding their language skills.** French language classes are available to help you adapt and make the most of your experience in France. Additionally, our curriculum encourages all students to internationalize through the study of multiple languages and by incorporating mandatory academic or internship mobility, ensuring a global approach to their education.

### PROJECTS

#### MULTIDISCIPLINARY TEAM PROJECT (M1)

Whether you join ECE for a semester or a year, you will have the opportunity to participate in or initiate an innovative project centered around a multidisciplinary topic. Known as the PPE, this project presents a dual challenge: developing a genuine team-based initiative and ensuring its successful technical execution. Guided by experienced Coaches and Experts, teams are given 8 months to deliver a tangible solution to a scientific problem.

# COURSE CATALOGUE - ENGINEERING PROGRAM - FALL 25

## DATA & AI MAJOR - M1

FIRST SEMESTER - ENGLISH 

### >ABOUT THE PROGRAM

The **Data & AI major** trains engineers who are capable of supporting companies in their digital transformation initiatives by setting up “Datalake” projects and analytical applications. These paradigm shifts bring a better understanding of governance issues and data quality.

### >PREREQUISITES

Applicants’ transcript of records must reflect knowledge in : **Programming (Python), Algorithms, Operating Systems, Databases, Machine Learning, Mathematics.**



[MORE INFO HERE](#)

COURSES	17 ECTS	HOURS
Introduction to Machine Learning	3	28
Advanced Databases	2	24
Operating Systems	1	6
Introduction to BI	3	24
Big Data Framework	3	24
Data Visualization	3	24
Data Science with Python	2	30

## DATA & AI MAJOR - M2

FIRST SEMESTER - ENGLISH 

### >ABOUT THE PROGRAM

The **Data & AI major** trains engineers who are capable of supporting companies in their digital transformation initiatives by setting up “Datalake” projects and analytical applications. These paradigm shifts bring a better understanding of governance issues and data quality.

### >PREREQUISITES

Applicants’ transcript of records must reflect knowledge in : **Programming (Python), Algorithms, Operating Systems, Databases, Machine Learning, Mathematics.**



[MORE INFO HERE](#)

COURSES	17 ECTS	HOURS
Advanced Business Intelligence	2	28
Big Data Processing & Application	2	12
Real Time Big Data Search & Analytics	2	20
Machine Learning in Production	3	28
Chatbots, Generative IA & Recommender Systems	3	28
Natural Language Processing	3	28
Data Management & Ethics	2	16

**ENERGY & ENVIRONMENT MAJOR - M1****FIRST SEMESTER - ENGLISH** **>ABOUT THE PROGRAM**

The **Energy and Environment Major** program will provide students with the necessary skills to understand the challenges of ecological, energy, and social transition. It aims to equip students with the ability to provide innovative solutions to the complex and multifactorial issues we face in all sectors of activity.

[\*\*MORE INFO HERE\*\*](#)

COURSES	17 ECTS	HOURS
Applied Chemistry	2	24
Physics for Renewable Energy I	3	22
Introduction to Energy Transformation and Storage	2	12
Thermal Machine	2	12
TechAway Programming	1	30
Energy Markets	2	12
Renewable Energy I	3	36
Upstream/Downstream Oil & Gas	2	24

**ENERGY & ENVIRONMENT MAJOR - M2****FIRST SEMESTER - ENGLISH** [MORE INFO HERE](#)**>ABOUT THE PROGRAM**

The **Energy and Environment Major** program will provide students with the necessary skills to understand the challenges of ecological, energy, and social transition. It aims to equip students with the ability to provide innovative solutions to the complex and multifactorial issues we face in all sectors of activity.

COURSES	17 ECTS	HOURS
Nuclear Energy II	2	12
Environmental Impact Assessment	1.5	12
Water Treatment & Waste Management	2	16
Indoor PV	1	12
Responsible Digital	1.5	16
Energy Policy and Regulation	1.5	12
Decarbonisation technologies	2	22
Building Thermal Design	3	32
Energy Storage System	1.5	14
Industrial Risk Management	1	8

## EMBEDDED SYSTEMS MAJOR - M1

FIRST SEMESTER - ENGLISH 

## &gt;ABOUT THE PROGRAM

The courses in the **Embedded Systems, Aeronautics and Robotics major** contribute fully to boosting innovation in the fields of intelligent transportation, personal assistance, sustainable mobility, home hospitalization, and consumption control.

## &gt;PREREQUISITES

Applicants' transcript of records must reflect knowledge in : **Mathematics, Electronics (analog and digital), Signal processing, Embedded Linux, C programming language.**


[MORE INFO HERE](#)

COURSES	15 ECTS	HOURS
Technical Project	3	-
Advanced Programming in C	3	27
Microcontrollers	3	29
Digital circuit design FPGA-VHDL	3	31
Embedded Linux	3	24

## CYBERSECURITY MAJOR - M1

FIRST SEMESTER - ENGLISH 

### >ABOUT THE PROGRAM

In the **Cybersecurity major**, students understand computer security and cybersecurity issues and learn to develop the technological knowledge needed to deal with cyber threats. How to build an Active Directory, an Azure Active Directory, how to develop an ISS security policy, etc. are all essential skills for a cybersecurity expert.

### >PREREQUISITES

Applicants' transcript of records must reflect knowledge in : **Web Technologies, Databases and Fundamentals of Computer Networks**



[MORE INFO HERE](#)

COURSES	23 ECTS	HOURS
Web Technologies	4	30
Advanced Databases	4	30
Operating Systems	4	30
Windows Server	2	-
Computer Networks	4	30
DevOps & SRE	5	30

## CYBERSECURITY MAJOR - M2

FIRST SEMESTER - ENGLISH 

### >ABOUT THE PROGRAM

In the **Cybersecurity major**, students understand computer security and cybersecurity issues and learn to develop the technological knowledge needed to deal with cyber threats. How to build an Active Directory, an Azure Active Directory, how to develop an ISS security policy, etc. are all essential skills for a cybersecurity expert.

### >PREREQUISITES

Applicants' transcript of records must reflect knowledge in : **Computer network, Operating systems (Windows and Linux), Programming (Python).**



[MORE INFO HERE](#)

COURSES	27 ECTS	HOURS
Cybersecurity Policies, Standards and Methodologies	3	20
Information Systems Security II	4	20
Windows Security	3	22
Identity and Access Management	3	16
Hybrid Identities Security	3	24
Incident Response, Forensics and Reverse Engineering	4	28
Cryptography	2	8
Linux Security	3	16
Safe Softwares Development	2	12

## MAJEURE CREATE - M1

FIRST SEMESTER - FRENCH 

## &gt;ABOUT THE PROGRAM

La Majeure CReATE forme des ingénieurs polyvalents, experts dans l'ensemble des étapes de création, développement, et industrialisation d'un produit numérique.

Nos étudiants acquièrent des compétences avancées pour maîtriser les technologies innovantes et répondre aux exigences des industries numériques mondiales.


[MORE INFO HERE](#)

COURSES (ALL ARE MANDATORY + ELECTIVE OPTIONS AVAILABLE TO REACH 30 ECTS)	17 ECTS	HOURS
Bootcamp DESIGN: Bias cognitifs	0*	6
Bootcamp DESIGN : Gamification	0*	6
WORKSHOP Learn to pitch	0*	6
Bootcamp MAKE IA GENERATIVE / Intelligence LAB	2	12
Bootcamp MAKE No Code WEB	2	12
Bootcamp MANAGE PMP (certification PMP)	0*	6
Bootcamp MANAGE Agile (certification agile)	0*	8
Hackathon CReATE IA / No code product	3	2
Bootcamp DESIGN UI/UX Design Web	1	14
Bootcamp MAKE IHM nouvelles générations	2	18
Bootcamp MAKE Développement web et IA (React +Copilot)	2	16
Bootcamp MAKE Déploiement et monitoring	1	4
Bootcamp MAKE Informatique Quantique	1	12
Bootcamp MANAGE Six sigma (certification Green Belt)	0*	12
Bootcamp MANAGE Design Thinking	0*	12
Hackathon CReATE A COOL WEB PRODUCT	3	2

\*The credits of the following courses will be allocated in the Hackatons where knowledge from these courses will be required.

## MAJEURE CREATE - M2

FIRST SEMESTER - FRENCH



### >ABOUT THE PROGRAM

La Majeure CReATE forme des ingénieurs polyvalents, experts dans l'ensemble des étapes de création, développement, et industrialisation d'un produit numérique.

Nos étudiants acquièrent des compétences avancées pour maîtriser les technologies innovantes et répondre aux exigences des industries numériques mondiales.



[MORE INFO HERE](#)

<b>COURSES</b> <i>(ALL ARE MANDATORY + ELECTIVE OPTIONS AVAILABLE TO REACH 30 ECTS)</i>	<b>17 ECTS</b>	<b>HOURS</b>
Industrie 4.0 - Cloud IoT	2	24
Design conversationnel vocal	3	30
Technologie des blockchains	2	24
Architecture de micro-services	2	24
Economie durable / Good Economy	2	12
MLOps & DataOps	2	18
Hackathon A GOOD APP (IA /NO CODE)	4	8

**MAJEURE SANTÉ ET TECHNOLOGIE - M1****FIRST SEMESTER - FRENCH****>ABOUT THE PROGRAM**

La Majeure **Santé & Technologie** a pour objectif de présenter les applications de la formation d'ingénieur dans les métiers reliés de près ou de loin à la santé. Elle apporte des connaissances et un vocabulaire médical nécessaires à la communication entre l'ingénieur, le patient et les professionnels de santé, et permet de constituer un réseau de contacts dans ce secteur d'activité.

[MORE INFO HERE](#)

COURSES	16 ECTS	HOURS
Système cardiovasculaire / Cardiovascular system	1,5	14
Physiologie et biocompatibilité / Physiology and Biocompatibility	1,5	14
Physiologie respiratoire et rénale / Respiratory and renal physiology	0,5	6
Système ORL et ophtalmique / ENT and ophthalmic system	0,5	6
Physiologie des tissus biologiques et immunologie / Immunology and Physiology of biological Tissues	1,5	14
Système de santé en France / Health Care Institutions in France	1	8
Evaluation d'un dispositif médical / Evaluation of a medical device	1,5	14
SI de Santé, interopérabilité, télémédecine / Health Information System, interoperability, telemedicine	1	8
Objets connectés et santé / IOT and Health	2.5	38
Stimulation cardiaque / Cardio stimulation	1	8
Gestion du risque patient / Patient Risk Estimation	1	8
Monitoring des fonctions vitales / Monitoring of vital functions	0.5	6
Traitement/analyse des signaux physiologiques / Treatment / analysis of physiological signals	2	22

## MAJEURE CLOUD ENGINEERING & MANAGEMENT - M1

FIRST SEMESTER - FRENCH



### >ABOUT THE PROGRAM

The **Cloud Engineering & Management major**, created by ECE with **Cap Gemini** and **Orange**, addresses the need for skilled professionals in the Cloud sector. It trains cloud engineers to deploy, store, and manage data in external data centers, focusing on algorithms, programming, and software architecture. Their roles involve securing sensitive data, optimizing energy use, managing big data, and maintaining client-supplier relationships.

### >PREREQUISITES

Applicants' transcript of records must reflect knowledge in : **Web Technologies, Databases and Fundamentals of Computer Networks**



[MORE INFO HERE](#)

COURSES	23 ECTS	HOURS
Cloud Strategy	4	12
Advanced Databases	4	27
Operating Systems	4	27
Windows Server	2	6
Computer Networks	4	27
DevOps and SRE	5	27

## MAJEURE CLOUD ENGINEERING &amp; MANAGEMENT - M2

FIRST SEMESTER - FRENCH



## &gt;ABOUT THE PROGRAM

The **Cloud Engineering & Management major**, created by ECE with **Cap Gemini** and **Orange**, addresses the need for skilled professionals in the Cloud sector. It trains cloud engineers to deploy, store, and manage data in external data centers, focusing on algorithms, programming, and software architecture. Their roles involve securing sensitive data, optimizing energy use, managing big data, and maintaining client-supplier relationships.

## &gt;PREREQUISITES

Applicants' transcript of records must reflect knowledge in : **Computer network, Operating systems (Linux), Programming (Python)**.


[MORE INFO HERE](#)

COURSES	17 ECTS	HOURS
Goodies	1	8
Architectures Microservices	2	8
Cloud Development	2	8
Multicloud Management Platform	1	4
Infrastructure As a Code (Terraform, Ansible, Staple, ...)	2	12
DevOps / Containers & Orchestrateurs	3	16
Infra CSP (Cloud Service Providers)	6	40
Manage a Team or a Cloud Project	2	16
Cloud Overview	2	12
Stratégie dans le Cloud	2	12
Sécurité dans le Cloud	3	12
Cloud de Confiance	1	6

## MAJEURE VÉHICULE CONNECTÉ & AUTONOME - MI

FIRST SEMESTER - FRENCH



### >ABOUT THE PROGRAM

The **Connected & Autonomous Vehicle major** aims to train engineers to meet the technological challenges of the automotive sector. The Autonomous Vehicle training module is jointly produced by **PSA & Renault**. This collaboration is unique in France. ECE participates in the automotive investment plan.

### >PREREQUISITES

Applicants' transcript of records must reflect knowledge in : **Mathematics, Electronics (analog and digital), Signal processing, Embedded Linux, C programming language**



[MORE INFO HERE](#)

COURSES	15 ECTS	HOURS
Technical Project	3	-
Advanced programming in C	3	-
Microcontrollers	3	-
Digital circuit design FPGA-VHDL	3	-
Embedded Linux	3	-

## MAJEURE FINANCE &amp; INGÉNIERIE QUANTITATIVE - MI

FIRST SEMESTER - FRENCH 

## &gt;ABOUT THE PROGRAM

The **Finance & Quantitative Engineering Major** focuses on the integration of artificial intelligence and blockchain technology, transforming banking, finance, and insurance. It reflects a societal shift from physical possession to virtual sharing. The Finance and Quantitative Engineering Major at ECE emphasizes a triptych of Teaching, Learning, and Projects, with courses redesigned for digital finance while preserving traditional strengths.

## &gt;PREREQUISITES

Applicants' transcript of records must reflect knowledge in : **Mathematics (graduate level), Computing (scientific).**


[MORE INFO HERE](#)

COURSES	17 ECTS	HOURS
Pricing - Risques du Marché	3	20
Numerical Optimization	1	12
Operations Research	1	12
Machine Learning Algorithms	3	20
Calcul Scholastique	2	14
VBA	3	16
TechAway Programming	1	-
AMF Certification	3	-

## MAJEURE FINANCE &amp; INGÉNIERIE QUANTITATIVE - M2

FIRST SEMESTER - FRENCH 

## &gt;ABOUT THE PROGRAM

The **Finance & Quantitative Engineering Major** focuses on the integration of artificial intelligence and blockchain technology, transforming banking, finance, and insurance. It reflects a societal shift from physical possession to virtual sharing. The Finance and Quantitative Engineering Major at ECE emphasizes a triptych of Teaching, Learning, and Projects, with courses redesigned for digital finance while preserving traditional strengths.

## &gt;PREREQUISITES

Applicants' transcript of records must reflect knowledge in : **Mathematics (graduate level), Computing (scientific).**


[MORE INFO HERE](#)

COURSES	17 ECTS	HOURS
Graph Theory	2	12
Numerical Optimization	1	12
Optimal & Hamiltonian control	2	16
S9 MOOC	2	-
Macroeconomy II : DSGE	2	14
Financial derivatives	2	16
Fusions-Acquisitions - LBO	2	22
Forecasting Techniques	1	20
Credits & Loans	2	10
Savings & Investings	2	-

## COURSE CATALOGUE - ENGINEERING PROGRAM - SPRING 25

### ELECTIVE & LANGUAGE COURSES - M1

#### FIRST SEMESTER

Engineering programs typically amount to **17 ECTS credits**. However, students can choose additional elective courses should they need to meet a required amount of 30 ECTS credits. The language of instruction for each course is specified on the right.

COURSES	ECTS	HOURS	LANGUAGE
French as a Foreign Language	5	30	-
English as a Foreign Language	5	36	-
Foreign Language: German, Arabic, Korean, Chinese, Spanish, Japanese (Taught in French)	3	21	FR
Multidisciplinary Team Project	8	84	FR
Budget Management	3	20	EN
Team Management	3	20	EN

## COURSE CATALOGUE - ENGINEERING PROGRAM - SPRING 25

### ELECTIVE & LANGUAGE COURSES - M2

#### FIRST SEMESTER

Engineering programs typically total **17 ECTS credits**. However, students can choose additional elective courses should they need to meet a required amount of **30 ECTS credits**. The language of instruction for each course can be found on the right. In M2, elective courses are grouped into thematic modules called "Option d'Approfondissement" (OA), with **each module worth 5 ECTS**. Students may select no more than one elective module due to risks of conflicting schedules.

COURSES	ECTS	HOURS	LANGUAGE
French as a Foreign Language	5	30	-
English as a Foreign Language	5	36	-
Foreign Language: German, Arabic, Korean, Chinese, Spanish, Japanese (Taught in French)	3	21	FR

# COURSE CATALOGUE - ENGINEERING PROGRAM - SPRING 25

## ELECTIVE & LANGUAGE COURSES - M2

### FIRST SEMESTER

Engineering programs typically total **17 ECTS credits**. However, students can choose additional elective courses should they need to meet a required amount of **30 ECTS credits**. The language of instruction for each course can be found on the right. In M2, elective courses are grouped into thematic modules called "Option d'Approfondissement" (OA), with **each module worth 5 ECTS**. Students may select no more than one elective module due to risks of conflicting schedules.

#### 1 MODULE MAXIMUM

OA - ELECTIVE MODULES	INCLUDED COURSES	5 ECTS	LANGUAGE
Négociation Commerciale	1.AMESIM Tool Training 2.Internal Combustion Engine 3.Electronic Motor & Components 4.Electrochemical Battery 5.Modules VR Lab e.nov 6.Electric Vehicle	5	FR
Calcul Scientifique	1.Algèbre matricielle numérique 2.Optimisation numérique 3.Résolution numérique des équations 4.aux dérivées partielles	5	FR
Aéronautique	1.Introduction aéronautique 2.Système électrique 3.Gestion du trafic aérien 4.Communication 5.Normes	5	FR
Data Scientist	1.Introduction au Machine Learning 2.Deep Learning 3.AI & Customer Services	5	FR
Informatique quantique	1.Fondamentaux de mécanique quantique 2.Complexité algorithmique et algorithme quantique 3.Bases de programmation en Python 4.Travaux pratiques en programmation quantique 5.Applications de l'informatique quantique à l'ingénierie 6.Technologies quantiques	5	FR
Business Process Automation	1.Pega System Architect Essentials 2.Pega Data Scientist	5	FR
Nanotechnologies	1.Physique des nano-composants 2.Physique de la matière molle 3.Cristaux liquides 4.Présentation des salles blanches et des techniques de lithographie 5.Fabrication et caractérisation de structure MIS	5	FR
Design Thinking	1.Design thinking sprint 2.UX design sprint 3.Storytelling & Retrospective	5	FR
Robotique	1.Automatique 2.Intelligence Artificielle	5	FR
Architecture Cloud	1.AWS Academy Cloud Foundation 2.AWSS Academy Cloud Architecting	5	EN-FR
Métavers	1.Introduction au Monde des Métavers 2.Plateformes et technologies 3.Business cases et projets 4.Réalisation d'un démonstrateur	5	FR
Hydrogène	1.Introduction OA H2 2.Propriétés et sécurité 3.Production Transport & Stockage 4.Piles à combustible, types et fonctionnement 5.Hydrogène et énergie renouvelable 6.Applications industrielle de l'hydrogène	5	FR
Generative AI	This course explores Large Language Models (LLMs), covering their foundations, infrastructure, tools, and best practices for development and deployment. It emphasizes hands-on experience, critical thinking, and ethical AI use, preparing participants to build responsible and decentralized AI applications.	5	EN