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 up 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 TO DECEMBER	
🇬🇧	ENERGY & ENVIRONMENT MAJOR			
🇬🇧	EMBEDDED SYSTEM MAJOR		CLOSED	
🇬🇧	CYBERSECURITY MAJOR	SEPTEMBER TO DECEMBER	SEPTEMBER TO DECEMBER	DECEMBER
🇫🇷	MAJEURE CReATE			
🇫🇷	MAJEURE SANTÉ & TECHNOLOGIE			
🇫🇷	MAJEURE CLOUD ENGINEERING & MANAGEMENT			
🇫🇷	MAJEURE VÉHICULE CONNECTÉ & AUTONOME		CLOSED	
🇫🇷	MAJEURE FINANCE & INGÉNIERIE QUANTITATIVE		SEPTEMBER TO DECEMBER	

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

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.

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.

30 ECTS TOTAL

CHOOSE YOUR MAJOR

MAJOR - 17 ECTS

CHOOSE YOUR ELECTIVE

ELECTIVE - 3-5 ECTS

CHOOSE YOUR LANGUAGE

FOREIGN LANGUAGE - 3-5 ECTS

JOIN A PROJECT

ONLY IN M1

MULTIDISCIPLINARY TEAM PROJECT - 8 ECTS

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.

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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

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ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

ENERGY & ENVIRONMENT MAJOR - M2

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
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

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

EMBEDDED SYSTEMS MAJOR - M1

FIRST SEMESTER - ENGLISH 🇬🇧

>**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.

>**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

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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 : **Computer network, Operating systems (Windows and Linux), Programming (Python).**

MORE INFO HERE

COURSES	17 ECTS	HOURS
Web Technologies	3	30
Advanced Databases	3	30
Operating Systems	3	30
Windows Server	1	-
Computer Networks	3	30
DevOps & SRE	3	30
TechAway	1	-

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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	17 ECTS	HOURS
Cybersecurity Policies, Standards and Methodologies	2	20
Information Systems Security II	2	20
Windows Security	2	22
Identity and Access Management	2	16
Hybrid Identities Security	2	24
Incident Response, Forensics and Reverse Engineering	2	28
Cryptography	1	8
Risk Management with EBISO-RM	1	12
Linux Security	2	16
Safe Softwares Development	1	12

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

MAJEURE CREATE - M1

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

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.

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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

COURSES *(ALL ARE MANDATORY + ELECTIVE OPTIONS AVAILABLE TO REACH 30 ECTS)*	17 ECTS	HOURS
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

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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, telemedecine	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

ECE

ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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 : **Computer network, Operating systems (Windows and Linux), Programming (Python).**

MORE INFO HERE

COURSES	17 ECTS	HOURS
Cloud Strategy	2.5	12
Advanced Databases	3	27
Operating Systems	3	27
Windows Server	1.5	6
Computer Networks	3	27
DevOps and SRE	3	27
TechAway	1	-

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

MAJEURE CLOUD ENGINEERING & MANAGEMENT - M2

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 : **Computer network, Operating systems (Windows and Linux), Programming (Python).**

MORE INFO HERE

COURSES	17 ECTS	HOURS
Goodies	0.5	8
Architectures Microservices	1	8
Cloud Development	1	8
Multicloud Management Platform	0.5	4
Infrastructure As a Code (Terraform, Ansible, Staple, …)	1.5	12
DevOps / Containers & Orchestrateurs	1.5	16
Infra CSP (Cloud Service Providers)	4	40
Manage a Team or a Cloud Project	1.5	16
Cloud Overview	2	12
Stratégie dans le Cloud	1.5	12
Sécurité dans le Cloud	1.5	12
Cloud de Confiance	0.5	6

MAJEURE VÉHICULE CONNECTÉ & AUTONOME - M1

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	-

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ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

MAJEURE FINANCE & INGÉNIERIE QUANTITATIVE - M1

FIRST SEMESTER - FRENCH 🇫🇷

>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.

>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	-

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

MAJEURE FINANCE & INGÉNIERIE QUANTITATIVE - M2

FIRST SEMESTER - FRENCH 🇫🇷

>**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.

>**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	-

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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

ECE
ÉCOLE D'INGÉNIEURS
ENGINEERING SCHOOL

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**

1 MODULE MAXIMUM

OA - ELECTIVE MODULES	INCLUDED COURSES	5 ECTS	LANGUAGE
Négociation Commerciale	1. AMESIM Tool Training 2. Internal Combustion Engine 3. Electronical 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**	**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**