

Exchange Program at Efrei Paris List of Programs and Courses 2024-2025

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Undergraduate Programs

Third Year (L3)

General overview of the Program

Semester	Period	Courses
Fall (S5)	2 nd September 2024 – 11 th January 2025	Scientific courses only in French
Spring (S6)	13 th January 2025 – 24 th May 2025	Scientific courses in French & English (common modules and 1 Elective)

Semester 5 – Program

Programs taught in French

Code	Module	Hours	ECTS
Mathématiques appliquées		75	
SM501	Automates finis, Expressions rationnelles, Graphes	45	3
SM502	Recherche Opérationnelle	30	3
Informatique - Fondamentaux		105	8
TI505N	Programmation Orienté Objet en Java	30	2
TI503N	Base de données	30	2
TI504N	Programmation Web	30	2
TI507N	Introduction au système Linux	15	2
Physique et électronique		60	6
TE506	Conception de Systèmes numériques en VHDL 1	30	2
TE508	Systèmes de transmission	30	2
Formation générale		105	8
FH501	Dissertation et communication orale	30	3
FE507	Culture économique et financière de l'ingénieur 1	15	1
FE508	Théorie des organisations et culture d'entreprise	30	3
FL501	English 5 – Job Market Skills	30	3
LV2ALL	LV2 - Allemand	15	1
LV2ANG	LV2 - Anglais	15	1
LV2CHN	LV2 - Chinois	15	1
LV2ESP	LV2 - Espagnol	15	1
LV2JAP	LV2 - Japonais	15	1
	Participation à la vie de l'école		
Projet transverse		15	2
TI550	Initiation à la recherche et Projet Transverse	15	2

Electives

Choose 1 Elective option below.

Harmonisation sciences (4 ECTS)			
TE503	Electronique	30	2
SM505	Probabilités	15	2
OR			
Harmonisation informatique (4 ECTS)			
TI500N	Algorithmique et Programmation	45	4

Semester 6 – Program

Programs taught in French

Common modules

Code	Module	Hours	ECTS
Mathématiques appliquées		60	5
SM601	Théorie des graphes	30	2,5
SM602	Recherche Opérationnelle	30	2,5
Informatique - Fondamentaux		45	3
TI603	Base de données avancées	30	2
TI609	Les fondamentaux du Cloud Computing	15	1
Physique et électronique		75	5
TE601	Théorie du signal 1	30	2
TE606	Conception de systèmes numériques en VHDL 1	15	1
TE609	Systèmes de transmission	30	2
Formation générale		105	6
FE608	Théorie des organisations et culture d'entreprise	30	3
FH601	Dissertation et écriture créative	30	3
FE607	Culture économique et financière de l'ingénieur 1	15	1
LV2ALL	LV2 - Allemand	15	1
LV2ANG	LV2 - Anglais	15	1
LV2CHN	LV2 - Chinois	15	1
LV2ESP	LV2 - Espagnol	15	1
LV2JAP	LV2 - Japonais	15	1
	Participation à la vie de l'école – International Day		
Projet transverse			
TI650	Initiation à la recherche et Projet Transverse	15	2

Electives

Choose 1 Elective option below.

Signaux et communication			
TE602	Théorie du signal 2	30	2
TE608	Conception de systèmes numériques en VHDL 2	15	2
OR			
Informatique			
TI616	Green IT	45	4

Programs taught in English

Common modules

Code	Module	Hours	ECTS
Mathématiques appliquées		60	5
SM601I	Graph Theory	30	2,5
SM602I	Operations Research	30	2,5
Informatique - Fondamentaux		60	3
TI603I	Advanced Databases	30	2
TI609I	Les fondamentaux du Cloud Computing	15	1
Physique et électronique		90	18
TE601I	Signal Processing 1	30	6
TE606I	Digital Systems Design with VHDL 1	30	6
TE609I	Transmission Systems	30	6
Formation générale			
FE607I	Financial and Economic Culture of Engineer 1	15	1
FE608I	Organization Theory and Corporate Culture	30	3
FL601	English 6 - Job Market Skills	30	3
LV2ALL	LV2 - Allemand	15	1
LV2ANG	LV2 - Anglais	15	1
LV2CHN	LV2 - Chinois	15	1
LV2ESP	LV2 - Espagnol	15	1
LV2JAP	LV2 - Japonais	15	1
PAVE	Participation à la vie de l'école – International Day		2
Projet transverse			
TI650	Initiation à la recherche et Projet Transverse	15	2

Electives

Choose 1 Elective option below.

Signaux et communication (FR) (4 ECTS)			
TE602I	Signal Processing 2	30	3
TE608I	Digital Systems Design with VHDL 2	15	3

OR			
Informatique (EN) (4 ECTS)			
TI616I	Green IT	45	4

Graduate Programs

Master 1 – Fourth Year

General overview of the Programs

The Master 1 Program is divided into 2 semesters: Fall Semester (S7A) and Spring Semester (S7B and S8). These semesters are composed of two periods each.

Fall semester: Academic program + Project and Language Modules

Semester	Period	ECTS
Semester 7A	16 th September 2024 – January 12 th 2025	30 or 20
Semester 7B	January 13 th 2025 – March 28 th 2025	10
Semester 8	31 st March 2025 – 26 th July 2025	30

Semester 7A – Programs

UE Mathematics (12 ECTS or 8 ECTS)		Language	Hours	ECTS*	ECTS**
ST2DA	Data Analysis	EN	30	3	2
ST2PS	Probability and statistics	EN	30	3	2
ST2GT	Graph Theory	EN	30	3	2
ST2NMC	Numerical Matrix Calculation	EN	30	3	2
UE Computer Science (12 ECTS or 8 ECTS)		Language	Hours	ECTS*	ECTS**
ST2DB	Databases	EN	30	3	2
ST2WP	Web programming	EN	30	3	2
ST2OOPJ	Object Oriented Programming with Java	EN	30	3	2
ST2PW	Python for Database	EN	30	3	2
UE Formation générale (6 ECTS or 4 ECTS)		Language	Hours	ECTS*	ECTS**
FL2MIN7	Business English	EN	30	3	2
FL2FLE7A	French as a Foreign Language	FR	30	3	2
FH2STCM1N	Projet Voltaire	FR	15	1.5	1
FH2ADS	Art de synthétiser	FR	15	1.5	1

*If the student stays for Fall only: 30 ECTS

** If the student stays for the Academic year: 20 ECTS

Semester 7B – Programs

UE Data Science (8 ECTS)		Language	Hours	ECTS
ST2MDSP	Data Science with Python	EN	30	2
ST2MDV	Data Visualization	EN	30	2
ST2MML	Machine Learning	EN	30	2
ST2MDATA	Database : administration and NoSQL	EN	30	2

OR

UE Security & Networks (8 ECTS)		Language	Hours	ECTS
ST2MNS	Networks Security	EN	30	2
ST2MIS	IT Security	EN	30	2
ST2MEH	Ethical Hacking	EN	30	2
ST2MVS	Virtualisation & Stockage	EN	30	2

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FP2IP	IMPULSE PROJECT	EN	60	2
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UE Formation générale (2 ECTS)		Language	Hours	ECTS
FL2FLE7B	French as a Foreign Language	EN	30	2

Semester 8 – Programs

DATA SCIENCE TRACK

Data and Artificial Intelligence (EN)

Code	Module	Language	Hours	ECTS
ST2CXO	Convex Optimization	EN	30	3
ST2AIC	Cloud Computing	EN	30	3
ST2FPS	Functional Programming with Scala	EN	30	3
ST2ML2	Machine Learning II	EN	30	3
ST2NOS	NoSQL Databases	EN	30	3
ST2DLS8	Neural Networks and Deep Learning	EN	30	3

Data Engineering (EN)

Code	Module	Language	Hours	ECTS
ST2MDE	Machine Learning for Data Engineers	EN	30	3
ST2AIC	Cloud Computing	EN	30	3
ST2DML	DevOps and MLOps	EN	30	3
ST2APIWS	API and Web services	EN	30	3
ST2NOS	NoSQL Databases	EN	30	3
ST2DLDI	Data Lakes and Data Integration	EN	30	3

Bio-informatics (EN/FR)

Code	Module	Language	Hours	ECTS
ST2MPGP	Metagenomics, Population Genetics and Phylogenomics	EN	30	3
ST2GEA	Genomics, Epigenetics and Applications	EN	30	3
ST2TBS	Biosignal Processing	EN	30	3
ST2BDMT	Cloud Computing for Health	EN	30	3
ST2MIV	Medical Image Processing and 3D Modeling	EN	30	3
ST2NDL	Neural Networks and Deep Learning	EN	30	3

Business Intelligence & Analytics (EN)

Code	Module	Language	Hours	ECTS
ST2ERPBI	Enterprise Resource Planning	EN	30	3
ST2MOD	Information System Modeling	EN	30	3
ST2DMBI	Data Mining	EN	30	3
ST2DSBI	Enterprise Data Warehousing	EN	30	3
ST2ABI	Advanced Business Intelligence	EN	30	3
ST2NOS	NoSQL Databases	EN	30	3

INFORMATION TECHNOLOGY TRACK

Digital Transformation (EN)

Code	Module	Language	Hours	ECTS
ST2MLE	Machine Learning for IT Engineers	EN	30	3
ST2CT	Collaborative tools	EN	30	3
ST2CBD	From Relational to Non-Relational Data Management	EN	30	3
ST2KM	Knowledge Management and Semantic Web	EN	30	3
ST2MOD	Information System Modeling	EN	30	3
ST2IOT	Internet of Things	EN	30	3

Software Engineering (EN)

Code	Module	Language	Hours	ECTS
ST2MLE	Machine Learning for IT Engineers	EN	30	3
ST2CBD	From Relational to Non-Relational Data Management	EN	30	3
ST2SDM	Software Design and Modeling	EN	30	3
ST2DCD	DevOps and Continuous Delivery	EN	30	3
ST2FUP	Functional Programming	EN	30	3
ST2DSY	Distributed Systems	EN	30	3

IT for Finance (EN)

Code	Module	Language	Hours	ECTS
ST2IBO	Investment Banking Operations: Backoffice, Middle, Frontoffice	EN	30	3
ST2CPP	Advanced C++ in Finance	EN	30	3
ST2EFA	Empiric Financial Analysis (in Python)	EN	30	3
ST2FIR	Risk Management in Modern Finance	EN	30	3
ST2ECN	Introduction to Econophysics: Financial Modelling with Natural Science	EN	30	3
ST2SPL	Scientific Programming Languages and Linux in Finance	EN	30	3

Image and Virtual Reality (FR)

Code	Module	Language	Hours	ECTS
ST2SNE	Simulation numérique pour les entreprises	FR	30	3
ST2IAI	Reconnaissances de formes et apprentissage machine	FR	30	3
ST2IHM	Réalité virtuelle et interaction homme-machine	FR	30	3
ST2ITI	Introduction au Traitement d'images	FR	30	3
ST2MPG	Modélisation géométrique pour la réalité mixte	FR	30	3

ST2TIM	Synthèse d'images	FR	30	3
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EMBEDDED SYSTEMS TRACK

Robotic Systems and Drones (FR)

Code	Module	Language	Hours	ECTS
ST2AIR	AI & ROS	FR	30	3
ST2CC	Contrôle commande	FR	30	3
ST2RMA	Robotique mobile avancée	FR	30	3
ST2VRA	Vision robotique et analyse	FR	30	3
ST2ECE	Eco-Conception Electronique	FR	30	3
ST2SEA	Systèmes Embarqués Avancés	FR	30	3

Intelligent Transport Systems (FR)

Code	Module	Language	Hours	ECTS
ST2ECE	Eco-Conception Electronique	FR	30	3
ST2RCTR	Réseaux de Communication Temps-Réel	FR	30	3
ST2SEA	Systèmes Embarqués Avancés	FR	30	3
ST2SMP	Simulation Multi-Physique	FR	30	3
ST2VSI	Vision pour les systèmes intelligents	FR	30	3
ST2BDSI	Big Data et systèmes intelligents	FR	30	3

SECURITY AND NETWORKS TRACK

Networks & Cloud Architecture (EN)

Code	Module	Language	Hours	ECTS
ST2BDNS	Big Data and Artificial Intelligence for Network and Security	EN	30	3
ST2CLI	Cloud Infrastructure	EN	30	3
ST2NSS	Network Services and Security	EN	30	3
ST2COS	Containers Orchestration and Security	EN	30	3
ST2QSV	Quality of Service	EN	30	3
ST2MSS	Windows administration	EN	30	3

Cybersecurity, IS, Internet Governance (CSIG) (FR)

Code	Module	Language	Hours	ECTS
ST2ARS	Architectures sécurisées	FR	30	3
ST2CDO	Classification des données	FR	30	3
ST2IAM	Gestion des identités - IAM	FR	30	3
ST2ISO	ISO 27005 & EBIOS-RM	FR	30	3

ST2PSCL	Projet sécurité (architecture sécurisée / cloud)	FR	30	3
ST2SCLO	Sécurité cloud	FR	30	3

Cybersecurity, Infrastructure, Computer Software (CIL) (FR)

Code	Module	Language	Hours	ECTS
ST2APM	Forensics et analyse post-mortem	FR	30	3
ST2CLV	Sécurité cloud et virtualisation	FR	30	3
ST2LXA	Sécurité Linux avancée	FR	30	3
ST2PENT	Pentest	FR	30	3
ST2PWAD	Projet sécurité (Windows/Forensics)	FR	30	3
ST2SWAD	Sécurité windows avancée & AD	FR	30	3

Cybersecurity and Cloud (FR)

Code	Module	Language	Hours	ECTS
ST2ACL	Architecture Cloud	FR	30	3
ST2COR	Containers Orchestration	FR	30	3
ST2GID	Gestion des identités – IAM-PKI	FR	30	3
ST2PTEST	Pentest	FR	30	3
ST2SOC	SOC Overview (SIEM/EDR)	FR	30	3
ST2SWD	Sécurité des identités hybrides	FR	30	3

General Education Modules

English cultural courses

Code	Module	Hours	ECTS
FL2BPL	Business Plan	15	1
FL2CB8	Capacity Building	15	1
FL2PS8	Critical Thinking and Public Speaking	15	1
FL2DW8	Developing World and Emerging Economies	15	1
FL2GF8	Issues in Global Finance	15	1
FL2MS8	Media Studies and Democracy	15	1
FL2GS8	Preparation for Graduate Studies Overseas	15	1
FL2TA8	Technology and Arts	15	1
FL2TSCF8	Technology and SciFi	15	1
FL2TS8	Technology and Society	15	1
FL2TSP8	Technology and Sports	15	1
FL2TWW8	Technology and the Written Word	15	1
FL2TW8	Technology and Well-being	15	1
FL2TC8	Technology in the Cinema	15	1
FL2CW8	Trends in the Corporate World	15	1

French as a Foreign Language

Code	Module	Hours	ECTS
FL2FLE8A	French as a Foreign Language	15	1
FL2FLE8B	French as a Foreign Language	15	1

Management

Code	Module	Language	Hours	ECTS
FE2MGMT	Management	FR	15	1
FE2MKTG	Marketing	FR	15	1

Master 2 – Fifth Year

General overview of the Programs

Semester 9 is an **academic program** running from beginning of November 2024 to early March 2025.

Semester	Period	ECTS
Fall (S9)	4th November 2024 – 8th March 2025	30

Instead of an academic program, exchange students have the possibility of conducting a **Research Project** from mid-September to mid-January or from mid-January to late May.

Semester	Period	Research Project	ECTS
Fall (S9)	16 th September 2024 – 13 th January 2025	Research project related to the student's scientific background and Efrei Paris' research fields.	30
Spring (S10)	13 th January 2025 – late May	Students will write a scientific article and highlight their research project and international mobility through a presentation or report	

Semester 9 - Programs

DATA SCIENCE TRACK

Data and Artificial Intelligence (EN)

Code	Module	Language	Hours	ECTS
ST2BDP	Big Data Ecosystem	EN	30	3
ST2CRS	Chatbots and Generative AI	EN	30	3
ST2DLAI	Natural Language Processing	EN	30	3
ST2DMG	Data Management and Ethics	EN	30	3
ST2ML3	Reinforcement Learning	EN	30	3
ST2MLP	Machine Learning in Production	EN	30	3

Data Engineering (EN)

Code	Module	Language	Hours	ECTS
ST2ABD	Applications of Big Data	EN	30	3
ST2BDF2	Big Data Frameworks II	EN	30	3
ST2CCBD	Cloud Certification for Big Data	EN	30	3
ST2DMG	Data Management and Ethics	EN	30	3
ST2MLP	Machine Learning in Production	EN	30	3
ST2MLD	Machine Learning for Data Engineers	EN	30	3

Bio-informatics (FR)

Code	Module	Language	Hours	ECTS
APFP92B	Mission d'apprentissage bioinformatique	FR	30	3
APFP94B	Projet Santé	FR	30	3
CBNF104	Utilisation et Applications de la Bio-informatique	FR	30	3
CBNF201	Bio-informatique Structurale, Drug design	FR	30	3
CBNF202	Nouvelles Technologies et leur Exploitation	FR	30	3

Business Intelligence and Analytics (EN)

Code	Module	Language	Hours	ECTS
ST2AML	Machine Learning for Data Analysts	EN	30	3
ST2BIG	Big Data Processing	EN	30	3
ST2AIK	Semantic Web, AI and Knowledge Management	EN	30	3
ST2AAN	Data Integration and Analytics	EN	30	3
ST2DABI	Data Analyst Certification	EN	30	3
ST2BDPV	Advanced Data Visualization	EN	30	3

INFORMATION TECHNOLOGY TRACK

Digital Transformation (EN)

Code	Module	Language	Hours	ECTS
ST2BPM	Business Process Management	EN	30	3
ST2ISG	Architecture and IS Governance	EN	30	3
ST2ISS	Information System Security	EN	30	3
ST2IISG	Performance Indicator for IS governance	EN	30	3
ST2DCCC	Cloud Computing	EN	30	3
ST2RDT	Responsible Digital Transformation for a sustainable society	EN	30	3

Software Engineering (EN)

Code	Module	Language	Hours	ECTS
ST2APR	Advanced Programming	EN	30	3
ST2DCE	DevOps and Continuous Deployment	EN	30	3
ST2SCL	Software Engineering for the Cloud	EN	30	3

ST2SCO	Secure Coding	EN	30	3
ST2SSA	Software Systems Architectures	EN	30	3
ST2TST	Software Testing	EN	30	3

IT for Finance (EN)

Code	Module	Language	Hours	ECTS
ST2ACPP	Applications of C++ in Finance	EN	30	3
ST2PMA	Pricing of Derivatives, Commodities and Energy Trading	EN	30	3
ST2POM	Portfolio Management in Modern Finance	EN	30	3
ST2DFI	Digital Finance, Cryptocurrencies, NFT's	EN	30	3
ST2AECN	Applied Econophysics: Financial Markets Analysis using Physics	EN	30	3
ST2IEI	Infrastructure, Exchanges and Institutions	EN	30	3

Image and Virtual Reality (FR)

Code	Module	Language	Hours	ECTS
ST2DLRA	Deep Learning pour la vision par ordinateur	FR	30	3
ST2CDJS	Conception et développement de jeux sérieux	FR	30	3
ST2V3D	IA générative et grands modèles de langage (LLM)	FR	30	3
ST2RA3D	Réalité augmentée et recalage 3D	FR	30	3
ST2VAAS	Vision artificielle et analyse de scène	FR	30	3
ST2ARVA	Applications de la réalité virtuelle et de la réalité augmentée	FR	30	3

EMBEDDED SYSTEMS TRACK

Transports Intelligents (FR)

Code	Modules Majeure Transports Intelligents	Language	Hours	ECTS
ST2ADAS	ADAS et Architecture des Systèmes Autonomes	FR	30	3
ST2NAPE	Navigation Autonome et Perception de l'Environnement	FR	30	3
ST2IAE	Intelligence Artificielle Embarquée	FR	30	3
ST2SSSI	Sûreté et Sécurité des Systèmes Intelligents	FR	30	3
ST2AFGV	Avions du Futur et Gestion de Vol	FR	30	3
ST2AMCE	Avionique Modulaire et Calculateurs Embarqués	FR	30	3

Robotic Systems and Drones

Code	Module	Language	Hours	ECTS
ST2RFS	Systèmes RF et Sécurité des transmissions	FR	30	3
ST2CO	Commande et observation	FR	30	3
ST2SMRD	Systèmes multi-robots multi-drones	FR	30	3
ST2VPE	Vision et Perception de l'environnement	FR	30	3
OP2IASR	IA pour les systèmes robotiques	FR	30	3
ST2BRI	Bras robotique industriel	FR	30	3

SECURITY AND NETWORKS TRACK

Cybersecurity, IS, Internet Governance (FR)

Code	Module	Language	Hours	ECTS
ST2PEN	Pentest	FR	30	3
ST2ISO1	ISO 27001 / 27003	FR	30	3
ST2ISO3	Projet sécurité (ISO 27003 – Gestion des risques)	FR	30	3
ST2PCA	Gestion des risques & PCA	FR	30	3
ST2CCR	Cybercriminalité, cyberguerre, lois et réglementation	FR	30	3

Choose 1 :

OP2VIR	Virus et technique virale	FR	30	3
OP2EDR	Endpoint detection & Response	FR	30	3

Cybersecurity, Infrastructure, Computer Software (CIL) (FR)

Code	Module	Language	Hours	ECTS
ST2AVL	Architecture sécurisée et analyse de vulnérabilité	FR	30	3
ST2CDA	Cyber défense et attaque	FR	30	3
ST2EDR	Endpoint Detection & Response	FR	30	3
ST2PCDA	Projet Sécurité (Defense / EDR)	FR	30	3
ST2SCA	Sécurité Cloud Azure	FR	30	3
ST2RGPD	RGPD & Gestion des risques	FR	30	3

Cybersecurity and Cloud (FR)

Code	Module	Language	Hours	ECTS
ST2MLW	Analyse de malware	FR	30	3
ST2DSO	DevSecOp	FR	30	3
ST2RIF	Réponse à incident – Forensics	FR	30	3
ST2SCA	Sécurité Cloud Azure	FR	30	3
ST2GRP	Gestion des risques & PCA	FR	30	3
ST2SECL	Sécurité cloud	FR	30	3

Elective Scientific Modules

Code	Module	Language	Hours	ECTS
OUVBP	PEGA Business Process certification	EN	30	3
OUVPM	Product Management	EN	30	3
OUVME	Mobilité électrique	FR	30	3
OUVNI	Numérique inclusif	FR	30	3
OUIDL	Artificial Intelligence, Deep Learning and Applications	EN	30	3

OUVBCO	Blockchain: Challenges and Opportunities	EN	30	3
OUVBPM	Business Process Management	EN	30	3
OUVCTF	Certification	FR	30	3
OUVDCD	DevOps and Continuous Delivery	EN	30	3
OUVDT	Design Thinking-Ethique	FR	30	3
OUVDTC	Ethique citoyenne	FR	30	3
OUVDTE	Ethique des Entrepreneurs	FR	30	3
OUVHPC	Introduction to HPC / GPU computing	EN	30	3
OUVIBI	Introduction to Bioinformatics	EN	30	3
OUIVOT	Internet of Things	EN	30	3
OUVKBC	Knowledge Based Company	EN	30	3
OUMMOB	Développement mobile	FR	30	3
OUMMSEC	Management de la sécurité	FR	30	3
OUVNET	Network Softwarization: Technologies and Enablers	EN	30	3
OUVPFS	Programmation fonctionnelle avec Scala	FR	30	3
OUVQT	Quantum Technologies	EN	30	3
OUVW3D	Web et 3D	FR	30	3

General Education Modules

French as a Foreign Language

Code	Module	Hours	ECTS
FL2FLE9A	French as a Foreign Language	15	1
FL2FLE9B	French as a Foreign Language	15	1

Management

Code	Module	Language	Hours	ECTS
FG2CSR	Corporate Social Responsibility	EN	15	1
FE2EN14	Innovation challenge	EN	15	1

*Availability to be confirmed