Catalogue of Programs 2018-19
Cycle M – FISE[1]

Version 2018.11.20

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[1] Graduate Courses for Registered Students

M

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This catalogue offers a detailed overview of the EFREI Engineering Curriculum at the Graduate Level (cycle M): semester 7 and semester 8 (Master 1), semester 9 and semester 10 (Master 2). It incorporates the latest changes as approved by the le Conseil de perfectionnement (CP) and implemented by the le Comité Permanent de Programme (CPP) of Efrei Paris during the academic year 2018/2019.

Courses are delivered in two broad tracks: the Sciencetific and Technical Training track (FST) and the General Education program track (FGI).

L   M   M   LM

The Scientific and Technical Training courses cover the foundational scientific and technical competencies as well as the cross-disciplinary project skills of the future engineer. These competencies and skills are delivered across 10 Majors. In addition, a further 8 thematic modules are available to student from which to choose.

Efrei's 10 Masters cycle Majors:

1. Information System and Cloud Engineering (ISCE)in French
2. *c   C   ca*   (BI) in English
3. *ca*   (BD) in English
4. *M   ac   c a* (IL) in English
5. Imaging and Virtual Reality (IRV) in French
6. *N   c*   (IFM) in English
7. Information Systems Security (SSI) in French
8. Droids and Drones (DD) in French
9. *H   e   Pc   c c*   (NV) in English
10. Avionics and Space (AE) in French

The eight Optional Scientific Modules:

1. Big Data for Companies (in English)
2. Artificial Intelligence: Machine Learning and Deep Learning (in English)
3. Blockchain: Challenges and Opportunities (in English)
4. Security Management (in French)
5. Web et 3D (in French)
6. Entrepreneurship and Innovation (in French)
7. Health Sector Innovation (in French)
8. Internet of things (in English)

All students are automatically enrolled in the interdisciplinary project modules regardless of declared major: the Innovation Project in M1 and the Capstone Project in M2.

I   B'

The General Education program includes none-scientific and technical training, which prepares students to successfully integrate the Business world as interculturally competent, and communicatively skilled IT Engineers. Courses cover topics such as Management, Culture, Communication, IT Careers, International Studies, Languages as well as the suite of e-Novation seminars.

Coordinator: Jean-Charles HUET (jean-charles.huet@efrei.fr)

I

The "Information System and Cloud Engineering" major aims to prepare engineers capable of intervening in a company's information system(s) regardless of its sector of activity. Information systems are at the heart of business, and accounts for all of the IT applications necessary for employees and collaborators to successfully carry out their professional responsibilities.

The Information System Engineer knows how to analyze an existing system, understand it, propose solutions to improve it and drive the implementation of these solutions. The IS Engineer develops solutions in line with their customers sector of activity and with the current advances in technology, such as cloud computing. These engineers will work closely with the upper management to best put in place the technological aspects of their strategy. In fact, the IS Engineer is often tasked with leading the management of large-scale project implementation. They are, consequently, in direct contact with the company, its management, its partners and collaborators, and the general contractor initially engaged to put in place solutions to help the organization successfully carry out its strategy.

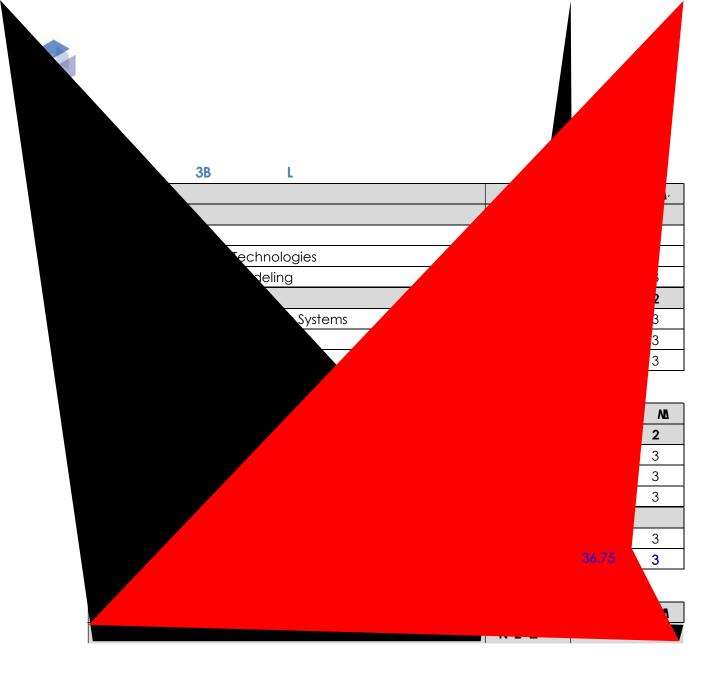All ISCE major courses are offered in English.

E   H
- Design an information system, guaranteeing the organization of its components in a coherent and harmonious manner.
- Ensure the integration of different components into an IT architecture by designing components that are both modular and reusable.
- Lead network and system infrastructure upgrades to standard, guaranteeing improvement in quality of service.
- Define operational performance indicators and ensure that the data generated by the various components are analyzed and organized for the effective development of organizational.

H
- General Contractor (IS)
- Project Manager
- Information System Architect
- Information Systems Security Consultant

Typical Career destinations: Service Industries, Large Retailers, Banks, Information Technology Consulting Firms, Business Software Development Publishers.

D   P

C   c M   c a   c   G   a   " G   c
    c   l   c   " l   c a C   c   M   M   c

4

3B   **L**

Technologies	
deling	
	2
Systems	3
	3
	3

	M
	2
	3
	3
	3
	3
36,75	3

Coordinator: Hanen Ochi (hanen.ochi@efrei.fr)

I

The major in "Business Intelligence" trains engineers able to design and implement the means, tools and methods to collect, consolidate, model and reproduce a company's data in order to assist in decision-making or defining strategy. Business Intelligence allows a decision-maker to have an overview of current activity while having visibility on the future evolutions and potential market developments. In sum, Business Intelligence is computer science at the service of decision-makers and business executives. Consequently, BI is embedded into the wider architecture of the wider information system in any company.

All BI major courses are offered in English.

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By the end of this program, the new BI Engineer will have the following skills:

- Design, configure and deploy decision-support and knowledge management;
- Process, exploit and leverage a company's data;
- Develop Business Intelligence Strategies.

H

- Data Scientist, Data Analyst
- Business Intelligence Consultant
- Project Manager for Decision-Support Systems
- Doctoral Studies

D   P

*cc   M   ;   c   ca   E   a G   a   C d G   a
c   C   ca   c   C   c M*

I   3   B

SEMESTER 7		I	M
	N 0 B		**2**
Web Services	ST2WBS	36,75	3
Information System Technologies	ST2TSI	36,75	3
Information System Modeling	ST2MOD	36,75	3
:	**N 0, B**		**2**
Operational Decision Making Systems	ST2ODS	36,75	3
Advanced Databases	ST2BDA	36,75	3
Introduction to Cyber Security	ST2ICS	36,75	3

SEMESTER 8		I	M
	N 1 B		**2**
Knowledge Management and Semantic Web	ST2KM	36,75	3
Data Warehouse	ST2DWH	36,75	3
Introduction to Big data	ST2TIBD	36,75	3
:	**N 1, B**		
Introduction to Business Intelligence	ST2IBI	36,75	3
Enterprise Resource Planning	ST2ERP	36,75	3

SEMESTER 9A		I	M
	N 2 B		**2**
Predictive Analytics	ST2PAN	36,75	3
Big Data	ST2BIG	36,75	3
Data Mining	ST2DMI	36,75	3
: H L F	**N 2. B**		**2**
Artificial Intelligence for Knowledge Discovery	ST2AIK	36,75	3
Big Data processing and visualization: tools and platforms	ST2BDPV	36,75	3
Optional Scientific Modules (Electives chosen from Modules on p.2)		36,75	3

F   3 L   &L

Coordinator: Nicolas Sicard (nicolas.sicard@groupe-efrei.fr)

I

Software Engineering covers the full range of services related to the integration of software components and specialized application products within a larger comprehensive project. The aim is to design, develop, deploy and maintain the components of the company's Information systems within the context of their strategic needs and/or to design, develop and maintain applications for the "general public" such as Web sites or web portals, e-commerce and so forth.

Software Engineers often have the following professional responsibilities:

- Analyzing and specifying the needs and requirements for the development of a software product or software system;
- Designing software based on the client's needs and specifications while ensuring the interest of the product and the software engineer on the fo
- Developing new products or systems based on existing software in accordance with appropriate technical and professional standards;
- Deploying adequate testing measures to guarantee that the software conforms to the stated specifications;
- Where necessary, ensuring the appropriate certification of software.

The ensemble of these activities is undertaken within a cost-planning and resource management framework.

The Software Engineer is a major player in this era of technological change and digitalization sweeping across all sectors of the economy (automotive, aeronautics, defense, banking, telecommunications...). Therefore, he or she should be trained as a general engineer with a solid Computer Science background who is able to analyze a client's needs, develop functional and

- Doctoral Studies.

The SE is most often a member of large project teams. Within this context, the experience gained allows for the transition to posts such as Project Manager.

SEMESTER 7		I	M
L B	N 0 L		2
C# and .NET environment	ST2CSH	36,75	3
Java Enterprise Edition	ST2JEE	36,75	3
DevOps and Continuous Delivery	ST2DCD	36,75	3
L B B	N 0, L		2
Application Interoperability with Web Services	ST2AIWS	36,75	3
System and Network Programming	ST2SNP	36,75	3
Introduction to Cyber security	ST2ICS	36,75	3

SEMESTER 8		I	M
L BB	N 1 L		2
Functional Data Programming	ST2FDP	36,75	3
Front-end Web Development	ST2FWD	36,75	3
Mobile Development	ST2MOB	36,75	3
L B BB	N 1, L		
Real-time systems	ST2RTS	36,75	3
Advanced Databases	ST2BDA	36,75	3

SEMESTER 9A		I	M
:	N 2 L		2
Event-driven Asynchrone Programming	ST2EAP	36,75	3
Software Engineering for the Cloud	ST2SCL	36,75	3
Distributed Systems	ST2SYR	36,75	3
L J H L F	N 2. L		2
Testing	ST2TST	36,75	3
Software Reliability and Quality	ST2SRQ	36,75	3
Optional Scientific Modules (Electives chosen from Modules on p.2)		36,75	3

F 3 &

Coordinator: Dmitry LEBEDEV (dmitry.lebedev@efrei.fr)

I

The major in "Big Data" prepares engineers capable of helping companies "extracting value" from their data. Course content includes theoretical components (e.g. Statistics, Machine Learning) and practical elements (e.g. data-centric programming, distributed systems for BIG data, data visualization). Multiple Case Studies included in the program help to reinforce an understanding of the potential role and application of these techniques in the value chain of companies as well as the proposal of Big Data solutions based on the needs of different fields.

All BD major courses are offered in English.

E   H

By the end of this program, the Big Data engineer will know how to:

- Apply machine learning methods to enterprise data;
- Implement Big Data, Data analysis and treatment solutions;
- Navigate the choice of Big Data solutions based on a company's strategic needs;
- Capitalize on and leverage data to the benefit of the business enterprise.

H

- Data Scientist
- Big Data Architect
- Data Engineer
- Big Data Consultant

D   P

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M   e L   c a ;   ɕc c   c   ɕɑ*

10

F   3 B   O   K   & BOK

Coordinator: Nicolas Flasque (nicolas.flasque@groupe-efrei.fr)

I

The "Imaging and virtual reality" major trains IT engineers capable of working on complex systems based on digital imaging, whether to perform additional processing on existing images, to create virtual scenes, and/or to combine the real and the virtual to generate an augmented reality. Digital image processing is a rapidly developing field. Students learn the techniques and gain experience working with the tools used by digital simulation and animation professionals. Likewise, they will gain an understanding of and be able to implement immersive digital environments.

E   H

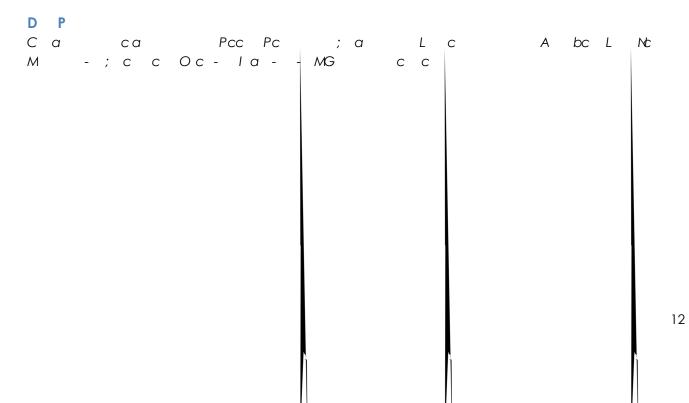By the end of this program, the IVR Engineer will know how to:

- Implement image processing and synthesis tools;
- Identify and integrate the elements of an immersive environment;
- Operationalize the tools and technologies for 3D;
- Demonstrate in-depth knowledge of the applications and the market for virtual and augmented reality;
- Master the mathematical foundations of Digital Imaging and 3D simulations.

H

The "Imaging and Virtual Reality" major prepares students for various technical-vocational fields and career opportunities such as:

- Project Leader on Tools for 3D Simulation;
- Dassault Systems, Thales, Total Immersion, VSM, General Electric, Car manufacturers, EDF.

These technical-vocational skills are most often employed within large project teams. Within this context, the experience gained allows the student to, for example, transition to posts such as Project Manager.

D   P

C   a   c a   Pcc   Pc   ;   a   L   c   A   bc   L   Nc
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			FB 2	(
	ST2...WS		3	
	ST2CSH		3	
Introduction to Cyber Security	ST2ICS	36,75	3	

			I	M
SEMESTER 8				

F   3BM   &BM

Coordinator: Johannes Gomolka (johannes.gomolka@efrei.fr)

I

The "IT for Finance" major trains specialists in the areas of computational and quantitative finance, collectively known as QUANTS. The course provides in-depth knowledge of IT infrastructure and the organization of modern financial markets, addressing the IT operations of financial market participants. This includes an introduction to the computer systems and hardware of investment banks, mutual funds or hedge funds, brokerages dealers, but also financial exchanges and clearing corporations, and custodians, regulators, and other market entities.
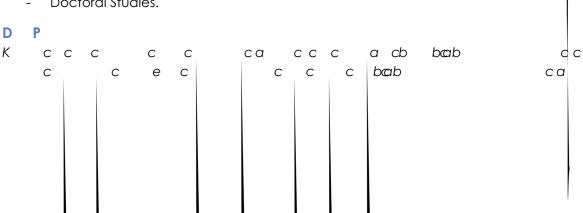
This knowledge of infrastructure and organization is the basis on which students construct software programs for financial market firms. While other programs focus on computational finance, developing mathematical, numerical models for trading solutions only, EFREI privileges the practical construction and implementation of financial market software, from an engineering point of view: applying programming languages and financial protocols in developing financial market software while understanding the context of applications. Emphasizing solid numerical and mathematical methods the program includes advanced knowledge on financial market risk, econometrics and statistics, as well as the application of such models in advanced testing and simulation environments, such as Monte Carlo Simulations, stress testing or portfolio optimization problems, but also execution and order management algorithms.

All ITF major courses are offered in English.

E   H

- IT infrastructure of financial markets (hard- and software)
- Functioning of financial markets
- IT Implementation (programming and operating software on different platforms)
- Analysis of mathematical, numerical optimization problems
- Ability to adapt to quantitative approaches into software coding

H

- Quantitative Finance Developer
- Quantitative Finance Trader
- Quantitative Finance Analyst
- Software Developer Financial Applications
- Business Analyst for Financial Applications
- Technical Advisors for hard- and software on financial markets
- IT Support Analysts
- Specialist for Back office Operations in Banking, Exchanges or Custodians
- Doctoral Studies.

D   P

*K   c   c   c   c   c   c a   c   c   c   a   cb   b c a b   c c
        c   c   e   c   c   c   c   b c a b   c a*

SEMESTER 7		I	M
B	N 0 BM		2
Introduction to Financial Markets	ST2IFM	36,75	3
Pricing of Derivatives: Models and Algorithms I	ST2PMA1	36,75	3
Econometrics for Finance	ST2EFF	36,75	3
B M B	N 0, BM		2
Application Interoperability with Web Services	ST2AIWS	36,75	3
C# and .NET environment	ST2CSH	36,75	3
Introduction to Cyber Security	ST2ICS	36,75	3

SEMESTER 8		I	M
BB	N 1 BM		2
Financial Risk	ST2FIR	36,75	3
Infrastructure and Exchanges	ST2PMA2	36,75	3
Numerical Analysis Applied to Finance	ST2NAF	36,75	3
B M BB	N 1, BM		
Advanced Databases	ST2BDA	36,75	3
Big Data Applied to Finance: Business Analytics	ST2BAN	36,75	3

SEMESTER 9A		I	M
BM :	N 2 BM		2
Numerical Analysis Applied to Finance	ST2NAAF	36,75	3
Quantitative Risk Analysis	ST2QRA	36,75	3
Numerical Optimization Methods	ST2NOM	36,75	3
: H L F	N 2. BM		2
Digital Finance	ST2DFI	36,75	3
Trading	ST2TRD	36,75	3
Optional Scientific Modules (Electives chosen from Modules on p.2)		36,75	3

F   3 L   &L L B

Coordinator: Driss Essayed (driss.essayed@efrei.fr)

I

To ensure the information systems security of an organization on a day-to-day basis is a challenging, vast and complex undertaking. Whenever information technology is used to improve an operation or provide a new service, the new solution is often susceptible to outside attacks seeking to access, modify or damage confidential data. The cost to a company from such attacks could be devastating and include not only reputational damage and/or a tarnished image but also possibly losing the competitive edge on important R&D projects, or worse, a complete shutting down of its operations.

In this constantly evolving context, the goal of the Security major is to give students the theoretical knowledge and applied tools to understand the various aspects of security in all its dimensions. The objective of this program is to produce engineers who possess a global vision of information systems security, and who are capable of designing and implementing solutions to mitigate risk and prevent hostile attacks aimed at compromising sensitive data, assets and, consequently, the daily operations of a company.

E   H

Design, implement, and maintain software systems to support the objectives of the company's security policy.
Assess the IT security risks faced by an organization
Evaluate the tools, material and human resources available to reduce risk and mitigate the effects of hostile action both internally and externally.
Securely manage the development and evolution of the information systems.

H

The Security curriculum prepares majors for multiple career options such as:

- Security Systems Development Engineer,
- Engineer/Consultant in Information Security,
- IT / IS Security Consultant,
- IT Security Expert - Pentest,
- Head of IS Security/Project Manager,
- Security Architect and Clearances,
- Security Auditor,
- RSSI
- Network Engineer / System Engineer
- Doctoral Studies

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	6,75	
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	ST2DEFA	36,75	3
Penetration Testing	ST2INT	36,75	
Forensic Investigations	ST2HFI	36,75	
: **H** **L** **F**	**N 2. LLB**		

F   3:   L   &:

Coordinator: Alain Moretto (alain.moretto@efrei.fr)

I

The "Avionics and Space" major is interdisciplinary and transversal covering the range of "digital intelligence and services" that affect the flying object (civil and military aircraft, large drones and satellites).

Courses cover the following themes:
- Sensors
- Dedicated networks,
- Calculators
- Storage and transmission (telecommunications) of large volumes of data (Big data) in an authenticated and secure way (IOT safety)
- HMI (head high, augmented reality)
- Pilot decision support (BI)
- Predictive maintenance (digital twinning)
- Multi-physics modeling of critical systems
- Re-configurable cabin services
- Aviations standards
- Project management in the aerospace industry

All SE major courses are offered in French.

E   H

By the end of this program, the new Avionics and Space engineer will have the following skills:

- Design, Calibrate, Size and Deploy services dedicated to the aircraft of the future
- Develop the architecture of embedded systems compliant with aeronautics standards
- Implement secure storage and transmission architectures for large volumes of data
- Deploy pilot assistance services
- Model complex and critical systems   d

M   L

SEMESTER 7			I	M
L K M		**N 0 :**		**2**
Digital Signal Processing and Processors		ST2DSP	36,75	3
Real-time Systems		ST2STR2	36,75	3
Hardware Architecture		ST2AMA	36,75	3
: L I		**N 0,:**		**2**
Sensors and Flight Mechanics		ST2CMV	36,75	3
Labview		ST2LBV	36,75	3
Aircrafts of the Future		ST2AVF	36,75	3

SEMESTER 8			I	M
H L L		**N 1 :**		**2**
Critical Systems and Modeling		ST2SCM	36,75	3
Hardware and Data Protection		ST2PDM	36,75	3
Virtual Dashboard and access techniques		ST2TBTA	36,75	3
B		**N 1, :**		
Big Data and Embedded Technologies		ST2BDTE	36,75	3
Estimation and Decision Making		ST2ESD	36,75	3

SEMESTER 9A (Major not offered in M2 2018/2019)			I	M

Coordinator: Elizabeth Colin ([elizabeth.colin@](#)

I

The "Droid and Drones" major prepares ... e a ... g hu... noid robots and drones, in particular, autonomous syste... en... ded... board. This multidisciplinary program combines e... f h... d so... ware), robotics, signal processing (in terms of image/spee... o... ei... urity, ambient intelligence and artificial intelligen...
These systems are intended for b... al ... it... ultiple applications in areas such as the e-health secto... ar... y, civilian and military surveillance, Defense, transpo...

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- Analyze and proce... gr... of l... ation) and control the system (in ter...
- Model, estimate... en... te re... l-time embedded requirements i...
- Implement n...
- Develop br... se... ions.
- Integrate ... d... orne).
- Design e... d... cts (m... bile or not)
- Implem... se... lve co... plex problems

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Robotics	ST2ROB	36,75	3
Control and Power Supply	ST2CEN	36,75	3
Vision and Digital communications	ST2VCN	36,75	3
B	**N 1,**		
Big Data and Embedded Technologies	ST2BDTE	36,75	3
Estimation and Decision Making	ST2ESD	36,75	3

SEMESTER 9A		**I**	**M**
: **B** **K**	**N 2**		**2**
IA et ROS	ST2IR	36.75	3
Autonomous Navigation and Fleet Control	ST2NC	36.75	3
Vision and Speech Recognition	ST2RVP	36.75	3
M **L**	**N 2.**		**2**
RF and EMC Architecture	ST2ARC	36,75	3
RF Systems and Secure Transmissions	ST2RFS	36,75	3
Optional Scientific Modules (Electives chosen from Modules on p.2)		36,75	3

Coordinator: Yessin Neggaz (yessin.neggaz@efrei.fr)

I

The "Networks and Virtualization" major allows students to have a broad theoretical and practical understanding of corporate network environments including network architecture, production, daily monitoring, security, and priority infrastructure and services studies in the context of recent developments in Cloud Computing.

I 3G O

SEMESTER 7		I	M
G	N 0 GO		2
Access, Core and Mobile Networks	ST2ACN	36,75	3
Scripting and Monitoring	ST2SMO	36,75	3
Switched and Routed Networks	ST2SRN	36,75	3
L O	N 0, GO		2
Cryptography and Network Security	ST2CNS	36,75	3
Virtualization, Cloud Computing and Storage	ST2CVR	36,75	3
Advanced Operating Systems	ST2AOS	36,75	3

SEMESTER 8		I	M
F G	N 1 GO		2
Quality of Service, VoIP and Modern Networking	ST2QSV	36,75	3
Foundations of Virtualisation and Applications	ST2VFA	36,75	3
Big Data, Networks and Security	ST2BDNS	36,75	3
G L :	N 1, GO		
Windows Administration	ST2WINA	36,75	3
Linux Administration	ST2LINA	36,75	3

SEMESTER 9A		I	M
B	N 2 GO		2
Infrastructure as a Service (IaaS)	ST2IAAS	36.75	3
PaaS and IaaS: Performance and diagnostics	ST2PERF	36.75	3
Virtualization Automation and Scripting	ST2VAS	36.75	3
L	N 2. GO		2
Cloud Security and White Hacking	ST2CSWH	36.75	3
Docker, SDN, Orchestration	ST2AVC	36.75	3
Optional Scientific Modules (Electives chosen from Modules on p.2)		36,75	3

H   L   F

Coordinator: Dario Vieira (dario.vieira@ efrei.fr)

I

The optional Scientific Modules are a group of theme-based scientific and technical electives open to all the students in semester 9A, regardless of declared major. Each thematic course explores the primary issues, current trends and potential opportunities related to the area of focus. There are no prerequisites required.

I   3L   F

SEMESTER 9		I	M
Artificial Intelligence, Deep Learning and Applications	OUVAIDL	36,75	3
Blockchain: Challenges and Opportunities	OUVBCO	36,75	3
Big Data for Companies	OUVBDC	36,75	3
Entrepreneurship and Innovation	OUVCE	35	3
Internet of Things	OUVIOT	36,75	3
Health Sector Innovation	OUVIS	36,75	3
Security Management	OUVMSEC	36,75	3
Web et 3D	OUVW3D	36,75	3

BB B M I

B I

Coordinators: Benoît Charroux (benoit.charroux@efrei.fr) / Andreas Topp (andreas.topp@efrei.fr)

As part of the Innovation project, students work in teams throughout the year of M1 of study. The year-long project provides students with the opportunity to experience:

> The entire lifecycle of a project (from the needs analysis to the market and up to the development of a prototype)
> The practical usage of a project management method (Scrum, an agile software development framework)
> The process of preparing a business plan
> The management of a project's human resources
> The application of quality management and testing methods
> The preparation of documents related to the project
> The presentation and defense of a project

This project includes the following three-fold supervision and guidance framework:

> Assistance from businesses to help the project team to launch a market study, imagine and develop a product or a service adapted to the market and establish a complete business plan (finance, marketing ...)
> The application of techniques for project management as well as assistance in developing a prototype
> Coaching workshops, and team support

Monitoring and Project Evaluation:

> Regular meetings with faculty and other actors during the project's different phases
> Continuous evaluation throughout the project's lifecycle (at each meeting and during the submission of deliverables)
> A contest for the best project of the year is held during the school's annual Innovation Day where selected projects are judged by a jury composed of representatives from the business community

I 3B I

SEMESTER 7		I	M
B I B	N 0		-
Coaching : Team Support	FT2AEQ	5.25	2
Business Plan I	FT2BPL	10.5	0
Methodology and Technical Monitoring I	FT2MTD	10.5	0
Project Monitoring Suivi de projet I	FT2PJT	10.5	0
Project Management	FT2GPJ	10.5	2

SEMESTER 8		I	M
B I BB	N 1		

Coaching: Team Support	FT2AE2	10.5	1
Business Plan II	FT2BP2	3.5	
Innovation Day	FT2INNO	3.5	
Methodology and Technical Monitoring II	FT2MT2	7	
Project Monitoring II	FT2PJ2	3.5	3

I   &M   B   B

Coordinator: Benoît Charroux (benoit.charroux@efrei.fr)

I

The Capstone project is carried out in the second year of the graduate engineering program (M2). The goal of this exercise is for students to demonstrate their ability to lead a project conducted by a team of engineers and emphasizes two essential components common to all types of professional projects: management and technique. The management component includes managing a team, project planning, and monitoring and controlling the project while respecting the various steps and processes. The nature of the technical component depends upon the type of project that students choose to carry out and may include programming, administrative services and comparative research tools. Students may choose to undertake projects related to a variety of professional domains. However, the professional domains must correspond to the content of Efrei's and Esigietel's programs. Besides the project work, the course Managing an R&D Project is a component of the Capstone project. This course explores how to finance and develop a project within a company.

E   H

The Capstone Project aims to develop engineers who will be able to:

- Demonstrate an ability to characterize an innovation and identify technological barriers
- Secure financing for a project
- Direct and lead an R&D project in defining its phases and the sourcing of teams

I

The Capstone Project is core requirement for all Efrei Paris and Esigetel students.

SEMESTER 9A		I	M
I B	N 2 :		
Projet: Technology Innovation and Intelligence I	ST2PFE1	24.5	

SEMESTER 9B		I	M
I BB	N 2		
Projet: Technology Innovation and Intelligence II	ST2PFE2	17.5	1

BBB I

F BM "

Coordinator: Agnès Béhar (agnes.behar@efrei.fr)

I

In a constantly evolving world that is full of dynamic challenges such as the globalization of financial markets and the ever-increasing pace of technological advances, companies are looking for young graduates who are able to understand today's issues, not only through a technical lens, but also on an economic and human level. Therefore, it is essential that Efrei and Esigetel students align their technical expertise with their professional skills.

The management electives allow students to become quickly operational in their professional field and readies them for a career path aimed at gaining positions of responsibility.

E H

By the end of this program, the student will be able:

- to lead projects in various professional contexts
- to display an ability to manage difficulties and prioritize
- to synthesize and analyze various types of information
- to develop a clearly defined outline for their career advancement
- to be proactive and forward thinking
- to display an ability to be a driving force for creativity and innovation

D P

Innovation Challenges, Elaboration of a Commercial Strategy, Management Simulation, the Foundations of Entrepreneurship, Strategic audit, Marketing and Innovation, Risk Management, Marketing IT, Financial Risk Management, Leading change in a changing world, Business Case Studies, e-business software, Customer Relations

Innovation Challenges, Development of a Commercial Offer, Management Simulation, The Basics of Starting Your Own Business, Strategic Auditing, Marketing and Innovation, Risk Management, E-marketing, Financial Risk Management, Leading change in a changing world, Company studies, E-business, Customer Relationship Management.

Career Opportunities
- Customer Services Manager
- Sales Representative
- Sales Application Engineer
- Client-Side Project Manager
- Large Account Manager
- Market Research Manager

Key Strengths
- Active learning: students complete the design and implementation of a scope of work provided by one of Efrei's business partners. Student teams pr by on heir propositions to the

- This course can be validated by completing a full-time internship in the Marketing or Commercial Sales sectors.

Given that the creation of a business is often linked to technological innovation, many students decide to take courses exploring entrepreneurship. The courses offered under this theme allow students to acquire management skills tailored to the specific context of entrepreneurship.

Career Opportunities
- Entrepreneur
- Profit Center Manager
- Business Unit Manager
- Subsidiary Manager

Key Strength
- The engineering internship can be the development of a student's his start-up
- Active learning: students complete the design and implementation of a scope of work provided by one of Efrei's business partners. Student teams present their propositions to the school's business partners who select the best project.
- There is the possibility for students to earn a double master's degree in entrepreneurship from EM Grenoble
- Long-term assistance: as the first years of starting a new business are always difficult, Efrei accompanies and assists entrepreneurs after graduation through through several actions:
  - Coaching for Alumni Entrepreneurs. They also have the possibility of obtaining a scholarship which offers them free space in Efrei's business incubator
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, B   I   F
Students who choose to take courses exploring the career of international project managers will become aware of the stakes and consequences of working in a globalized world. They will train to be business developers who are ready to carry out actions on an international and global level.

Career Opportunities
- Profit Center Manager
- Business Unit Manager
- Subsidiary Manager

Key Strengths
- Instructors have experience in advising, managing and coordinating projects and creating subsidiaries at the international level
- All courses are taught in English
- Student diversity: more than 50% of the students exploring the career of an international project manager are international students

-

New information and communication technologies are a company's central nervous system. Due to the pace of evolution of these new technologies, companies must often work with consulting firms in order to stand out from their competitors, adapt to instabilities in the markets and to be able to better anticipate such changes. Students who choose to take courses exploring the career of a consultant

will develop the competencies that will allow them to design and put into place organizationally

Case studies done in teams and led by professionals

O   K

The objective of this course is to train students in the research methods and to understand the constraints and conditions of between research and application. The content focuses on developing documentary research skills, refining the capacity to evaluate, synthesize and present research findings, and identifying issues related to the conduct of research that integrates concepts related to

- R&D Engineer
- x Innovation Management Consultant
- x R&D Project Manager
- x Doctoral Studies

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Business Consultant	0 (7 & 2 1		$d
Entrepreneurship: The Basics of Starting Your Own Business			

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Entrepreneurship: Management Simulation UPSTRAT-INOBIKE	METENT2	19.25	1
Entrepreneurship: - Entrepreneurial Leadership	METENT3	19.25	1
BGMKG: NIH G: E I KH C MF : G: K			
International project manager - Business Simulation Winexpert (English)	METIPM2	19.25	1
International Project manager - International Project Management	METIPM3	19.25	1
H GL NEM GM			
Consultant: Management Simulation USPTRAT-FI	METCO2	19.25	1
Consultant: Strategic Audit	METCO3	19.25	1
BGGH O: NIH G: G LMK: M R			
Business Simulation Winexpert (English)	METINN2	19.25	1
Managing Innovation	METINN3	19.25	1
QI KM			
Expert: Management Simulation USPTRAT-FI	METEXP2	19.25	1
Expert: Change Management	METEXP3	19.25	1
K L : K A: G O EHIF GM			
Research and Development: Business Simulation Winexpert (English)	METRD2	19.25	1
Research and Development: Patents, Norms and Standards: Challenges and Opportunities for Technology Transfer	METRD3	19.25	1

SEMESTER 9B		I	M
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E-novation:Digital Strategy	FE2EN1	19.25	1
E-novation: E-Business	FE2EN2	19.25	1
E-novation: - Stratégie digitale	FE2EN3	19.25	1
E-novationWeb-video Communication	FE2EN4	19.25	1
E-novation: Web Technology Trends and Developments	FE2EN6	19.25	1
E-novation: Digital Nomadism	FE2EN7	19.25	1
E-novation:Artificial Intelligence and Transhumanism	FE2EN8	19.25	1
Globalized World: International Entrepreuneurship Management	ME4CO	19.25	1
Globalized World: International Business Strategy	ME4E	19.25	1
Globalized World: Economic Intelligence and Technology Intelligence	ME4IN	19.25	1
Globalized World: International Financial Markets	ME4MA	19.25	1
Globalized World: Cross-Cultural Management	ME4PM	19.25	1
Globalized World: Geopolitics and strategy	ME4IA	19.25	1
Globalized World: Intercultural Management	ME4MI	19.25	1

ICT and Management: Digitizing Management	ME6CO	19.25	1
ICT and Management: Innovation challenges (En)	ME6E	19.25	1
ICT and management: Technology and Market Foresight	ME6IN	19.25	1
ICT and Management: Financial Risk Management	ME6MA	19.25	1
ICT and Management: E-Marketing	ME6PM	19.25	1
ICT and Management: UX design and Web Usability	ME6UXD	19.25	1
ICT and Management: Data Storytelling	ME6DS	19.25	1

L

Coordinator: Agnès Béhar (agnes.behar@efrei.fr)

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Information and communication technologies are an integral component of the management of a company's activities and are widely applied across various sectors of economic activity. These electives were developed with the aim of giving students in-depth knowledge of the technical, scientific and economic aspects that make up the character of the area of activity under study. Courses cover three major elements:

1. The fundamental engineering techniques and business expertise of business relating to each sector and the current state of play.
2. The role of ICT (information and communications technology) in the different business processes of the particular sector.
3. The economic, geopolitical, organizational and managerial environment of the particular sector.

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By the end of this program, the student will be able to

- apply fundamental theoretical knowledge and practical techniques pertinent to the area of activity under study;
- display a deep understanding of economic, geopolitical, organizational and administrative environments of the area of activity under study;
- recognize the impact and place of the a   ☐   nd a

Coordinator: Jean Soma (jean.soma@groupe-efrei.fr)

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The courses taught by faculty in the Department of Culture and Communication explore in-depth the intersection of the art of communication and the art of management. In essence, our focus is the human dimension of an IT engineer's education, as this constitutes perhaps the most complex aspect to understand than the more tangible technical dimensions of their training.

In this sense, the courses at the graduate level have two primary objectives: the first is to raise students' awareness of communication issues that arise in professional contexts; the second is to open students to the world outside of their usual frames of reference through the exploration of philosophy, psychoanalysis, literature, etc.

These two educational objectives rely on various materials, tools and methods that promote the assimilation of both content (e.g. theories) and practice (e.g. behavior).

Therefore, the courses, most notably the seminars (18 hours), are primarily comprised of applied studies, such as simulations, role-plays, case studies, project-based learning, coaching workshops, etc.

E   H

By the end of this program, the students will be able to

- Master the expression, the structuring and the formulation of ideas
- Demonstrate intellectual curiosity, adaptability, and advanced levels of abstraction level (including methods of interpretation)
- An Effective Public Speaker
- Work effectively in a team, including multicultural groups demonstrating autonomy, adaptability / capacity to integrate
- Effectively analyze and synthesize information
- Lead or facillitate meetings
- Function as an educator while taking the lead on proposals and innovation
- Demonstrate social, cultural and emotional intelligence (mastery of social codes, openness, ability to listen, etc.)

D   P

B   K   E

Coordinator: Christiane Michel (christiane.michel@efrei.fr)

E

At the Master's level, the English foreign language program aims to improve the oral communication and writing skills of our engineering students and to promote a greater degree of autonomy and sophistication across the multiple modes of expression. Students who have already attained advanced level competence in English have the opportunity to select thematic seminars where English language is no longer the object of the study but the vehicle through which to explore the proposed course topic. The seminars offered address the following themes: English Business Communication, Development in Asian countries, technological innovation and creativity, introduction to finance; social networks and media among others. For students who have not yet reached a sufficient level of competence in English, a general English course is offered to help reinforce spoken and written skills and prepare for the TOEIC exam..

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The study of a second foreign language is optional for graduate students but strongly encouraged across the curriculum. Learning a second language enhances students' cultural awareness, allowing them to develop a broader worldview and opening up study and work opportunities for them in non-English speaking countries. The languages taught are Spanish, German, Chinese and Japanese.

Classes are taught in the "target" language via a communicative approach that best replicates the processes of acquiring one's native language.

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French as a Foreign Language (FLE) is offered to Efrei's international students. The International student population at EFREI can be divided into two categories: 1) students who speak French at an advanced level and are doing their studies in French, and 2) students who are doing their studies in English and need to improve their French for both personal and professional reasons. The content of this program is specifically tailored to the needs of these two different groups of students. However, in both cases, emphasis is placed on the development of cultural, academic and professional competences to better facilitate academic and professional integration. .

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SEMESTER 7		I	NA
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English 7 - Developing World and Emerging Economies	FL2DW7	19.25	1
English 7 - Media Studies and Democracy	FL2MS7	19.25	1
English 7 - Preparation for Graduate Studies Overseas	FL2GS7	19.25	1
English 7 - Capacity Building	FL2CB7	19.25	1
English 7 - Critical Thinking and Public Speaking	FL2PS7	19.25	1
English 7 - Technology and Arts	FL2TA7	19.25	1
English 7 - Issues in Global Finance	FL2GF7	19.25	1

English 7 - Trends in the Corporate World	FL2CW7	19.25	1
English 7 - Technology in the Cinema	FL2TC7	19.25	1
English 7 - Technology and Society	FL2TS7	19.25	1
French Foreign Language 7A	FL2FLE7A	19.25	1
French Foreign Language 7B	FL2FLE7B	19.25	1
Foreign Language 2	LV2FAC	17.5	1

SEMESTER 8		I	M
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English 8 - Developing World and Emerging Economies	FL2DW8	19.25	1
English 8 - Media Studies and Democracy	FL2MS8	19.25	1
English 8 - Preparation for Graduate Studies Overseas	FL2GS8	19.25	1
English 8 - Capacity Building	FL2CB8	19.25	1
English 8 - Critical Thinking and Public Speaking	FL2PS8	19.25	1
English 8 - Technology and Arts	FL2TA8	19.25	1
English 8 - Issues in Global Finance	FL2GF8	19.25	1
English 8 - Trends in the Corporate World	FL2CW8	19.25	1
English 8 - Technology in the Cinema	FL2TC8	19.25	1
English 8 - Technology and Society	FL2TS8	19.25	1
French Foreign Language 8A	FL2FLE8A	19.25	1
French Foreign Language 8B	FL2FLE8B	19.25	1

SEMESTER 9A	*Code*	*FFP*	*ECTS*
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G E A K "			
English - 9 Capacity Building	FL2CB9	17,5	1
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French Foreign Language 9	FL2FLE9A	17,5	1
E O "			
Foreign Language 2 – optional	LV2FAC	17,5	1

8G   L

Coordinator: Agnès Béhar (agnes.behar@efrei.fr)

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E-Novation Seminars focus on the impact of digital technologies in the corporate environment.

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SEMESTER 9B		I	NA
H	N 20		-

8G L F BG: KL E NBO L"			
E-novation: Digital Strategy	FE2EN1	19.25	1
E-novation: E-réputation	FE2EN2	19.25	1
E-novation: Digital Strategy	FE2EN3	19.25	1
E-novation: Web-video Communication	FE2EN4	19.25	1
E-novation: Web Technologies: Trends and Developments	FE2EN6	19.25	1
E-novation: Digital Nomadism	FE2EN7	19.25	1
E-novation: Artificial Intelligence and Transhumanism	FE2EN8	19.25	1
E-novation: Digital Strategy	FE2EN1	19.25	

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Coordinators: Roxane Chevallier (roxane.chevallier@efrei.fr), Annick Fitoussi (annick.fitoussi@efrei.fr),
Stéphanie Soetemondt (stephanie.soetemondt@efrei.fr)

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Participation in student life, or the PAVE, is an integral part of the curriculum because it helps students to:

- Expand student worldview
- Network with and integrate into the corporate world
- Build their professional and personal profiles
    - ➢ The PAVE program provides students the opportunity to learn about and effectively exploit social and professional registers while enhancing their social, cultural and emotional intelligence

In terms of skills to acquire and develop, the PAVE experience is fully consistent with:

- General Education Engineer Training program
- Working in Project models
- The evolution of the company's expectations in terms of recrutement in France and internationally

4 possibilités   pour s'investir dans :

- Les actions liées à la communication du Groupe
- La participation à la vie associative
- La fonction de délégué
- Les activités liées au Pôle Égalité des Chances et Diversité

et développer des qualités et compétences telles que :

- La rigueur et l'organisation
- L'esprit d'initiative
- L'esprit d'équipe
- L'écoute et le respect d'autrui
- Etc…

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PAVE Semester 8	PAVE		1

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