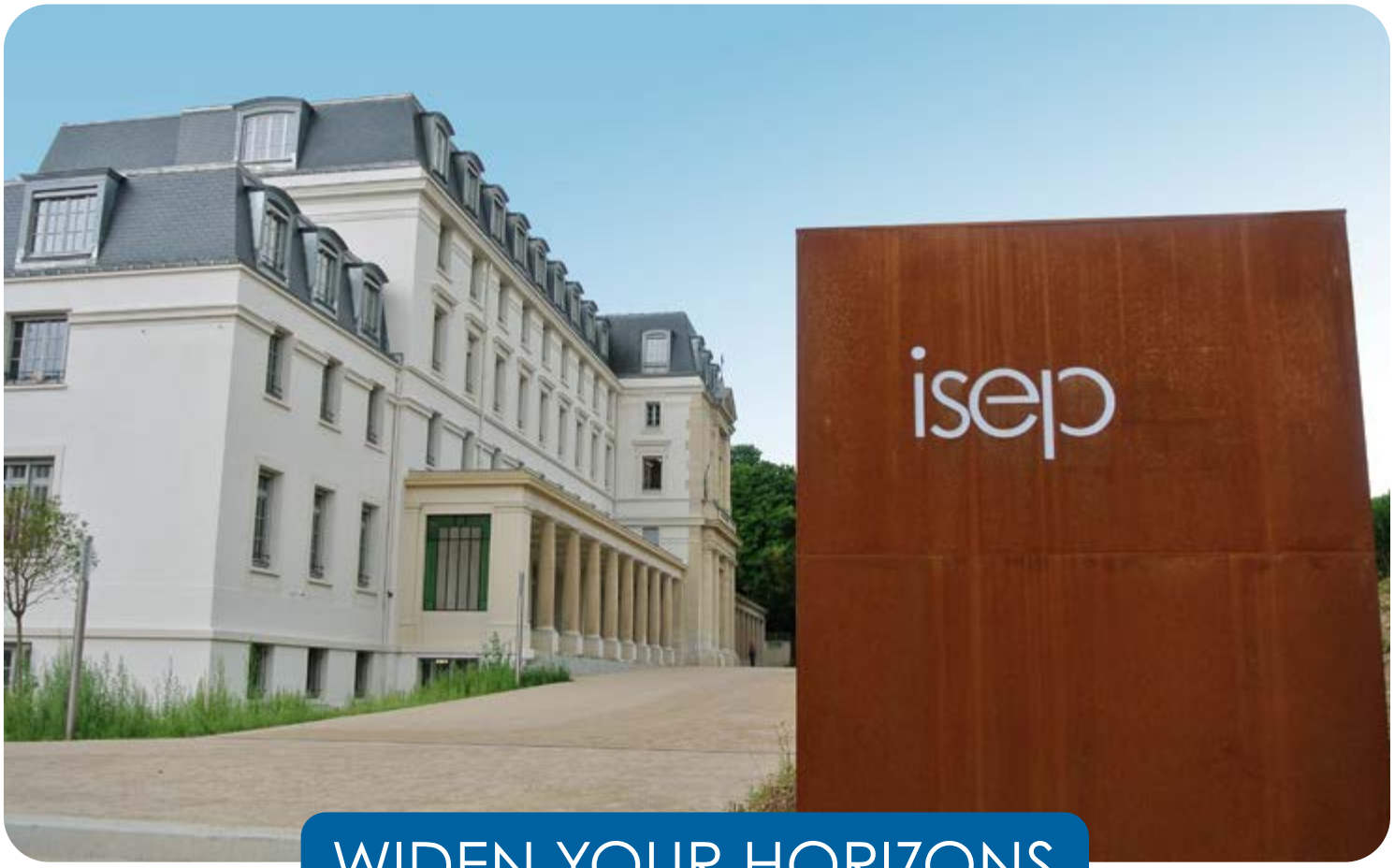
isep

École d'ingénieurs du numérique



WIDEN YOUR HORIZONS

ENGINEERING GRADUATE SCHOOL IN PARIS

www.isep.fr

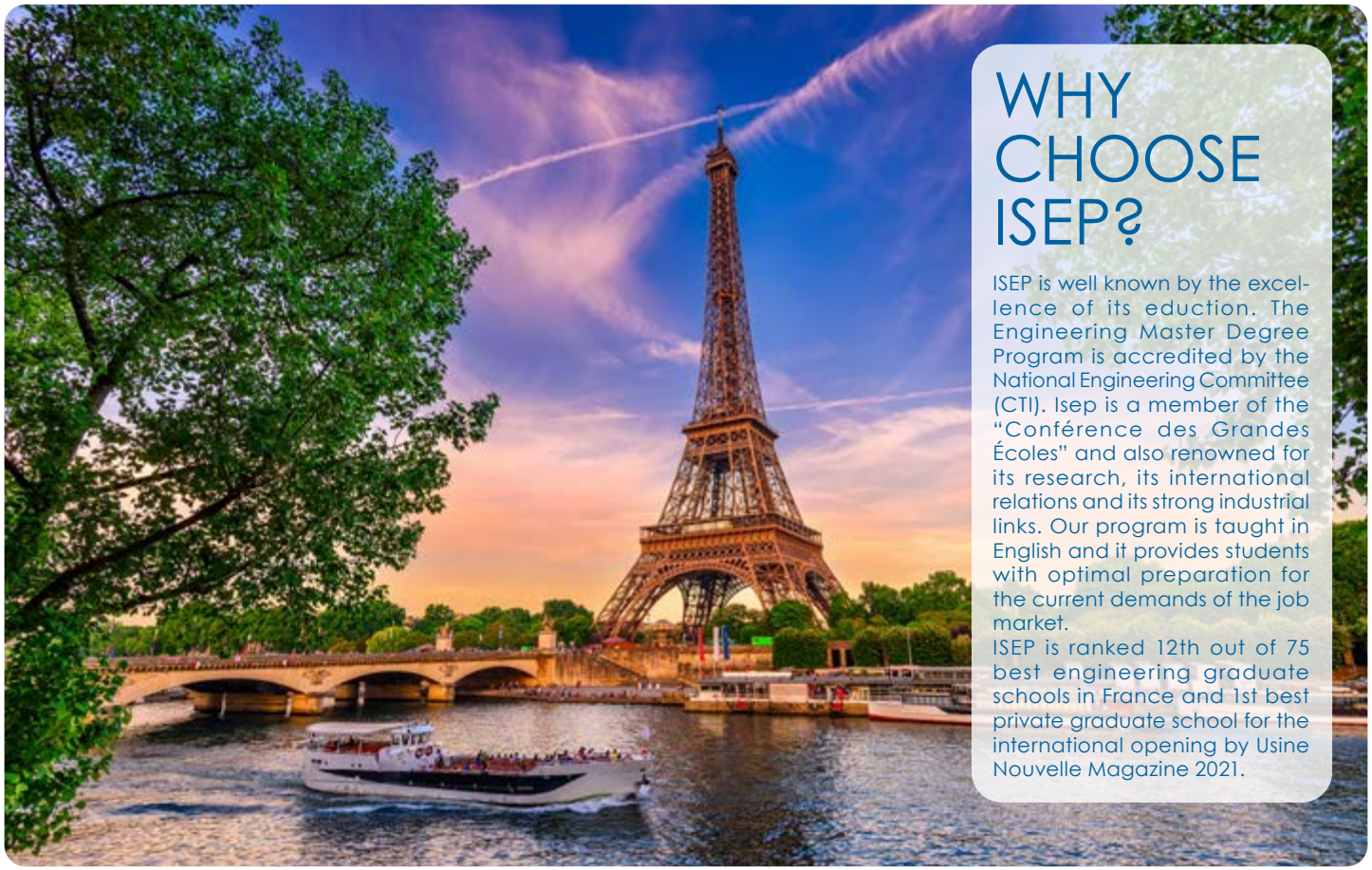
WELCOME TO ISEP!

28, rue Notre Dame des Champs – Paris (6e)

10, rue de Vanves – Issy-les-Moulineaux (92)

Dieudonné Abboud
ISEP General
Managing Director

ISEP is a French engineering graduate school in digital technology, known as a "Grande École d'Ingénieurs". ISEP trains very high-level graduate engineers who receive a thorough training in Electronics, Telecommunications & Networks, Software Engineering, Signal-Image Processing and Humanities, providing them with the required knowledge and skills to meet the needs of businesses. Since 2008, ISEP has been offering an international program taught fully in English which allows international students to obtain the Engineering Master Degree. Thanks to a strong partnership with the companies in related industries, this program includes a professional internship. Join ISEP to build a better future so that the digital technology is at the service of Humanity.



WHY CHOOSE ISEP?

ISEP is well known by the excellence of its eduction. The Engineering Master Degree Program is accredited by the National Engineering Committee (CTI). Isep is a member of the "Conférence des Grandes Écoles" and also renowned for its research, its international relations and its strong industrial links. Our program is taught in English and it provides students with optimal preparation for the current demands of the job market.
ISEP is ranked 12th out of 75 best engineering graduate schools in France and 1st best private graduate school for the international opening by Usine Nouvelle Magazine 2021.

RESEARCH

The research at ISEP is organized within a single laboratory LISITE (Laboratory of Computer Science, Signal and Image, Electronics and Telecommunication).
The main research areas of the laboratory are Artificial Intelligence, Resource Management in Multi-User Wireless Systems, Advanced Image Processing and Coding Methods, Energy Harvesting Systems, Micro & Nano Electronic Systems. Research at ISEP finds its applications in several areas:
- Health and Medical Image processing
- Connected environments: Internet of Things, sensor networks, autonomous vehicles, LiFi, 5G, etc.
- Environment and sustainable agriculture
- Education and enhancing human learning.

The laboratory develops close relationships with industrial partners and universities. Finally, the laboratory organizes and participates in the organization of national and international conferences.

INTERNATIONAL

More than 400 international students per year demonstrates the attractiveness of ISEP. The school has more than 150 university partnerships in 5 continents. ISEP also welcomes many international professors from prestigious universities like Stanford, Berkeley or IISc…

INDUSTRIAL LINKS

Built around the real needs of the business world, ISEP graduates engineers benefit from an excellent reputation. They are particularly appreciated by industrial firms for their ability to become quickly operational and efficient. Moreover, 150 lecturers coming from various industries are taking part in the training of our students.

STUDENT ACTIVITIES

ISEP also has many student clubs ranging from sports to sciences and technology... Among them, the ISEPA student association is in charge of the development of cultural exchanges with international students (please see page 5), the Junior ISEP association offers consulting services and it is one of the best junior companies among graduate schools.

ISEP ENGINEERING MASTER DEGREE PROGRAM

The ISEP Engineering Master Degree Program is a 4-semester program. This degree is recognized by the French government, accredited by the national French engineering committee CTI. In addition, it is recognized as an international Master degree within the European Bologna scheme. As proof of its international excellence, ISEP has received the label EUR-ACE.

STUDENT CAN CHOOSE ONE OF THE FOLLOWING SPECIALIZATIONS:

The program is open to graduates with a Bachelor's degree in Science/Engineering or to students who are in the last year of University in the relevant disciplines e.g. Electrical Engineering, Electronic Engineering, Telecommunications, Computer Science, Computer-Engineering, Information Technology, etc.

HOW TO APPLY?

Complete the online application form and upload the following documents:

- ID photo
- Copy of passport
- Curriculum Vitae
- Statement of purpose
- 2 letters of recommendation
- Copy of transcripts for each university previously attended as well as certified translations into French or English, including a copy of the degree
- TOEFL (minimum score 550PB/213CB/79iBT) or equivalent test (IELTS...)

APPLICATION DEADLINE: July 15th
TUITION FEE PAYMENT DEADLINE: August 1st

USEFUL INFORMATION

Housing

ISEP helps international students to be housed in a residence hall, a private room or a flat, thanks to our private housing database.

Pre-arrival Information

We recommend you arrive 2 weeks before the program starts.

During the information day, you will be given the ISEP "Guide for International Students". It will give you practical information about administrative procedures, living expenses, transportation, health insurance, etc. In addition, all ISEP students will receive an "ISIC card". It offers a lot of advantages: discounts on planes or trains travel, car rental, hotels, restaurants, leisure activities, etc...

FOR FURTHER INFORMATION:

For more information about the ISEP Engineering Master Degree Program, please contact:

Phone: +33 1 4954 5267 or +33 1 4954 5224

Fax: +33 1 4954 5201

E-mail: international@isep.fr

Website: http://en.isep.fr

ISEPA

Created in October 2012, ISEPA is run by a dynamic and motivated team willing to help students coming to ISEP from all around the world. In a nutshell, ISEPA's mission is to welcome them and make sure they find their way quickly in Paris.

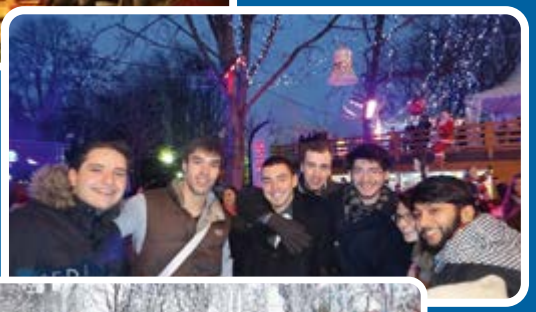
Throughout the year, the team organizes activities and visits, while trying to erase the cultural and language barriers by creating moments of exchange between the French and international students. Foreign students will discover French culture thanks to the Christmas Day for instance but will also be able to share their culture for the Chinese New Year, Diwali Festival and other cooking events.

ISEPA's particularity is to accompany students in their professional projects (helping them to write a resume and letter of motivation for example). ISEP is truly the place where students can share and cultures can blend.

If you are an international student, ISEPA is the perfect place for you to discover the beautiful French culture and take part in ISEP's exciting student life!

You can easily contact ISEPA on the Facebook group "ISEPA international students" or using the website: www.isepa.fr.

JOIN US!



EMBEDDED SYSTEMS

OBJECTIVES

The embedded systems are the heart of automatic devices in our daily life. The design of embedded systems represents an economical stake for manufacturers: it increases the value of equipments and improves the competitiveness of companies. France has several worldwide industries in aerospace, in military and space industry, in energy, in rail, in telecommunications, automotive etc. which have been users of embedded systems for decades: EADS, Thales, Airbus, Renault, etc.

The embedded systems major addresses the design, the implementation and the management of complex systems (aricraft, cars, trains…). The competences involved are the design of standardized and reliable functionning hardware and software devices/objects. The acquired knowledges cover the fields of electronics and software engineering at system level design.

JOB PROSPECTS

Equipement manager, system expert, project manager, embedded platform architect, embedded technologies expert/support manager, embedded applications architect, Software Development expert, Qualifation/ validation Expert, Test expert, integration expert/manager, process & methods/ quality/certification expert.

COURSE CONTENT

SEMESTER 1

COMPUTER MICROSYSTEMS
- C language programming: memory allocation, pointer and API
- Operating system description: process/ thread/memory/supervision, shell & system programming

PROJECT-BASED LEARNING IN ELECTRONIC AND SIGNAL
- Analog electronics: signal conditioning, analog filter, power management
- Digital electronics: microcontroller based sensor management, bluetooth link
- Fourier series and transform, sampling, digital filtering

NETWORK FUNDAMENTALS
- Network communication, communication channel
- Layer approach, OSI model, TCP/IP model
- Network devices, network addressing models

DATA SCIENCE FUNDAMENTALS
- Probability theory
- Statistics (descriptive statistics, statistical theory of estimation, hypothesis testing)
- Data science (principal component analysis, linear regression)

ELECTRONICS FOR IOT
- Deepening on Microcontroller
- Battery management, low power design, Power conversion
- Wireless link, protocoles and capabilities low power
- Green communication design, System implementation

ENGLISH, FRENCH AND HUMANITIES COURSES

- Deterministic data processing: Data transforms, filtering, linear prediction
- Random data processing: Distributions, estimation, measure errors; correlation...

CYBERSECURITY
- Information systems security
- Web application and network security
- Introdution to Cryptography, etc.

ANALOG SYSTEMS
- Power electronics
- Noise and conditionning
- Amplification chain
- Analog to digital converters
- Radiofrequency communications

ENGLISH, FRENCH AND HUMANITIES COURSES

CHOOSE ONE COURSE BETWEEN:

INTRODUCTION TO ARTIFICIAL INTELLIGENCE
- Applications of artificial intelligence to problem solving
- Methods of problem formalization and knowledge representation
- Resolution algorithms associated with these representations

INTERNATIONAL BUSINESS INNOVATION PROJECT
- Build real business model in a multicultural team
- Create innovative idea with marketing & business strategies
- Present final business model to professionals

SYSTEM CONSTRAINTS AND IMPLEMENTATION
- Methodology development cycles and systems
- Life cycle of software, of hardware
- System simulation, tools for formal proof
- Real-time UML

PROJECT
The project is composed of an advanced case study. The students will be called upon to use the knowledge, design techniques and tools that they learnt through their courses

ENGLISH, FRENCH AND HUMANITIES COURSES

CHOOSE TWO COURSES AMONG:

AUTOMATIC CONTROL/REAL TIME
- System model, state space, optimum command theory
- States representation
- Reliability of components & cards

SMART CITIES / CONNECTED AND AUTONOMOUS VEHICLES
- Challenges of the smart city
- Instructions for a stronger economic development
- Industry 4.0 market technical
- Smart Transportation
- Aviation market techno-economic analysis

MEDICAL ROBOTICS
- Kinematics of medical robots
- Imaging guided medical robots
- Tracking and surgical navigation

MACHINE LEARNING
- Linear predictor, convex learning
- Gradient descent, Kernel Methods
- Support vector machine, Decision trees

SEMESTER 2

ELECTRONIC MICROSYSTEMS
- Instruction set architecture
- Logic design, computer arithmetic
- CPU design, memory hierarchy
- Multicore and GPU models

DATA AQUISITION AND PROCESSING
- Data types: qualitative, quantitative

SEMESTER 3

SAFETY AND RISK ANALYSIS
- Failure trees – failure density, failure rate
- Reliability of components, of boards, of systems, life duration, physical failure analysis – methods and tests
- Redundant systems, serial, parallel, vote, triplication
- Coded systems
- Standards on quality, standards on safety
- Electromagnetic compatibility of systems

SEMESTER 4

INTERNSHIP
The internship with an international company will enable students to display valuable professional skills and attitudes developed during the three academic semesters.
ISEP will provide you with assistance in your search for an internship. Companies usually give a stipend to the trainees.

Syllabus: subject to minor modifications

SOFTWARE ENGINEERING

OBJECTIVES

With the rapid development of computerization and networks in our daily life, the software development is unavoidable. The needs of talented software engineers with a good expertise and capacity for technology monitoring are required to tackle new markets and to innovate in software.

The software engineer is an expert who can adapt himself/herself in any environment. He/She is involved in the design, implementation, development of software in several industrial domains. He/she has a global view and a large knowledge from hardware to algorithm layers.

JOB PROSPECTS

IT consultant, IT project manager, expert of development in major industrial groups (Banks, Automotive, Aircraft...) or start-up, R&D in software industry (IBM, Google, Microsoft...).

COURSE CONTENT

SEMESTER 1

COMPUTER MICROSYSTEMS

- C language programming: memory allocation, pointer and API
- Operating system description: process/ thread/memory/supervision, shell & system programming

PROJECT-BASED LEARNING IN WEB DEVELOPMENT

- Database management system: relational and object models, database schema, queries
- WEB architecture: client, server, communication protocols
- HMI: ergonomy, dynamic contents generation, formatting
- Propagation & antenna, digital transmission, link budget

NETWORK FUNDAMENTALS

- Network communication, communication channel
- Layer approach, OSI model, TCP/IP model
- Network devices, network addressing models

JAVA/SOFTWARE ENGINEERING

- Java Programming
- Software engineering
- Agile software development methods

DATA SCIENCE FUNDAMENTALS

- Probability theory
- Statistics (descriptive statistics, statistical theory of estimation, hypothesis testing)
- Data science (principal component analysis, linear regression)

ENGLISH, FRENCH AND HUMANITIES COURSES

SEMESTER 2

WEB TECHNOLOGIES

- Client-side Web application: Java Servlet, Java Server Pages, Cookies, Sessions, JDBC, MVC
- Server-side Web application: WEB development methods and process, HTML, CSS, Javascript, HTML5, CSS3/4, Frameworks and Javascript tools, AJAX

ADVANCED ALGORITHMIC AND PROGRAMMING

- Graph theory, algorithm design
- Advanced Java: compound design patterns, network programming, functionnal programming

DATA BASE AND BIG DATA

- Advanced querying techniques
- Non-relationnal databases

INFORMATION SYSTEMS ARCHITECTURE

- Hardware and software architecture
- Service-oriented architecture and Rest APIs
- Virtualization and administration of an operating system
- Cloud Computing

ENGLISH, FRENCH AND HUMANITIES COURSES

CHOOSE ONE COURSE BETWEEN:

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

- Applications of artificial intelligence to problem solving
- Methods of problem formalization and knowledge representation
- Resolution algorithms associated with these representations

INTERNATIONAL BUSINESS INNOVATION PROJECT

- Build real business model in a multicultural team
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- Present final business model to professionals

SEMESTER 3

DISTRIBUTED PROGRAMMING AND ARCHITECTURE

- Typology of distributed systems
- Distributed applications properties: interoperability, scalability/elasticity, load balancing, consistency, fault tolerance
- Communication: protocols, topologies
- Concurrent programming
- Distributed algorithms & application patterns

FORMAL APPROACH, LANGUAGES AND COMPILATION

- Abstact Syntax Trees
- Compilation algorithms
- Proof of program properties, model-checking
- Typed programming languages, lamba calculus

PROJECT

The project is composed of an advanced case study. The students will be called upon to use the knowledge, design techniques and tools that they learnt through their courses

ENGLISH, FRENCH AND HUMANITIES COURSES

CHOOSE TWO COURSES AMONG:

MOBILE APPLICATION DEVELOPMENT

- Introduction to the dedicated services for mobiles
- Handsets capabilities and market overview
- Android development basics & tutorials
- Project

MACHINE LEARNING

- Linear predictors, convex learning
- Gradient descent, kernel methods
- Support vector machine, decision trees

SOFWARE SECURITY

- Fundamental notions about computer security & software security
- Malwares and software's low level vulnerabilities
- How to write a secure code (DevSecOps and security in SDLC)?
- Web application vulnerabilities

3D AND IMMERSIVE APPLICATIONS USING XR

- State of the art and use cases of XR technologies
- Design principles and associated specificities
- Development pipeline of 3D application with Unity3D.
- Develop an immersive 3D application or experience (in support of VR or AR hardware)

SEMESTER 4

INTERNSHIP

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Syllabus: subject to minor modifications

WIRELESS TELECOMMUNICATION AND IoT SYSTEMS

OBJECTIVES

The Wireless Telecommunication and IoT Systems specialization presents all the necessary building blocks for the design, the planning, the deployment and the optimization of mobile wireless communication and connected object networks, as well as digital techniques for transmission and communication.

The Wireless Telecommunication and IoT Systems engineer is an expert that can advise IoT clients on the technologies to choose to inter-connect objects. He/she has the know-how to implement the next generation technologies by operating the highly efficient networks.

JOB PROSPECTS

R&D engineer, Integration Engineer, Validation Engineer, Research Engineer, Telecommunication Support Engineer, Technical Sales Engineer, Telecom Project Manager.

COURSE CONTENT

SEMESTER 1

JAVA/SOFTWARE ENGINEERING
- Java programming
- Software engineering
- Agile software development methods

ELECTRONICS OF THINGS
- Deepening on Microcontroller
- Battery management, low prower design, Power conversion
- Wireless link, protocoles ans capabilities low power
- Green communication design, System implementation

PROJECT-BASED LEARNING IN ELECTRONIC AND SIGNAL
- Analog electronics: signal conditioning, analog filter, power management
- Digital electronics: Microcontroller based sensor management, bluetooth link
- Fourier series and transform, sampling, digital filtering

NETWORK FUNDAMENTALS
- Network communication, communication channel
- Layer approach, OSI model, TCP/IP model
- Network devices, Network addressing models

DATA SCIENCE FUNDAMENTALS
- Probability theory
- Statistics (descriptive statistics, statistical theory of estimation, hypothesis testing)
- Data science (principal component analysis, linear regression)

ENGLISH, FRENCH AND HUMANITIES COURSES

SEMESTER 2

DATA AQUISITION AND PROCESSING
- Data type: qualitative, quantitative
- Deterministic data processing: Data transforms, filtering, linear prediction
- Random data processing: Distributions, estimation, measure errors, correlation...

CYBER SECURITY
- Information systems security
- Web application and network security
- Introduction to Cryptography

CELLULAR TECHNOLOGIES AND IOT
- Architecture and Engineering of cellular mobile communications networks
- Characteristics of the radio propagation (noise, interference, protection against the errors)
- Mobility & Security in cellular communications netwoks
- Multiplexing users

DESIGN OF CONNECTED SYSTEMS
- Introduction to the Internet of Things
- Overview on IoT Networks
- Enabling Technologies, Protocols and Applications
- Low Power Wide Area Networks (LPWAN)

ENGLISH, FRENCH AND HUMANITIES COURSES

CHOOSE ONE COURSE BETWEEN:

INTRODUCTION TO ARTIFICIAL INTELLIGENCE
- Applications of artificial intelligence to problem solving
- Methods of problem formalization and knowledge representation
- Resolution algorithms associated with these representations

INTERNATIONAL BUSINESS INNOVATION PROJECT
- Build real business model in a multicultural team
- Create innovative idea with marketing & business strategies

SEMESTER 3

HIGH-RATE NETWORKS
- Free Space Optics (FSO)
- Optical Networks
- G21, allocation of spectral resources in optical networks
- Wavelength-division multiplexing (WDM)
- Satellite communications

VIRTUALIZED ARCHITECTURES AND CONVERGED SERVICES
- Network orchestration
- Virtualization of network functions (NFV), Open Stack, Opendaylight
- Software Defined Networks (SDN)
- Systems and protocols for converged services
- Quality of service (QoS) and quality of experience (QoE)

PROJECT
The project is composed of an advanced case study. The students will be called upon to use the knowledge, design techniques and tools that they learnt through their courses

ENGLISH, FRENCH AND HUMANITIES COURSES

CHOOSE TWO COURSES AMONG:

SMART CITIES / CONNECTED AND AUTONOMOUS VEHICLES
- Challenges of the smart city
- Instructions for a stronger economic development
- Industry 4.0 market technical
- Smart Transportation
- Aviation market techno-economic analysis

ROUTING AND ADVANCED ARCHITECTURE
- Core network architectures based on protocols such as MPLS
- Implementation of IPv6 networks, and planning for existing network migrations
- Advanced inter-AS routing protocols (autonomous system)

AUDIT AND RISK MANAGEMENT
- Principals of Cybersecurity Governance
- Cybersecurity standards overview
- Security Architecture, Security Audit
- PAM, BCP, Forensic & Incident response, DRP

MACHINE LEARNING
- Linear predictors, convex learning
- Gradient descent, kernel methods
- Support vector machine, decision trees

SEMESTER 4

INTERNSHIP
The internship with an international company will enable students to display valuable professional skills and attitudes developed during the three academic semesters.
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Great reasons to apply to ISEP in Paris

1st average **salary** **€45 046**

100% of **students employed** after graduation

About **400** **international students** per year

More **than 150 partnerships worldwide** in **45 countries**

150 lecturers from the industry

30 student clubs and organizations

Corporate partnership with more than **400 companies**

Internship (6 months)

A **dynamic alumni network** (more than **9 900 alumni**)

www.isep.fr

Engineering Graduate School in the heart of Paris!

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10, rue de Vanves – 92130 Issy-les-Moulineaux – France
international@isep.fr