




RÉPUBLIQUE  
FRANÇAISE

*Liberté  
Égalité  
Fraternité*



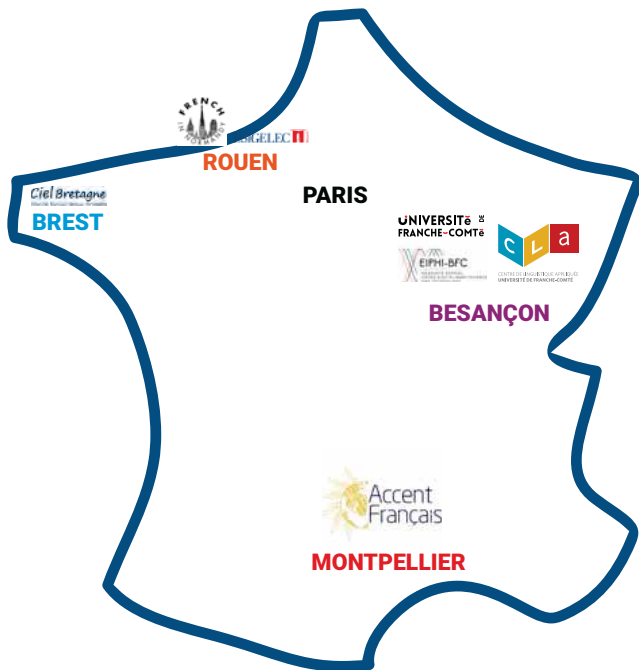
CAMPUS  
FRANCE

FRENCH   
SCIENCES  
PROGRAMS

Get a Taste  
of Science  
in France!



# FRENCH SCIENCES PROGRAMS



## PARTICIPANTS\*

Undergraduate (bachelor's level) students seeking a period of language, scientific, and cultural immersion in France.

Language requirements:

- > In French: beginner (or better)
- > In English: level B2 required



## OBJECTIVES

- > To explore scientific and technical cutting edge sectors through site visits to companies, conferences and encounters with specialists in the field
- > To acquire or improve communication skills in French
- > To discover four of the most beautiful regions of France



\* 10 students minimum required

## 4 3 WEEKS AT ACCENT FRANÇAIS, MONTPELLIER

Focus on Sustainable Development



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With its long and proud tradition of science and higher learning, Montpellier is internationally renowned for research in the fields of health, agronomy, and the environment. It is also the birthplace of modern medicine.

## 8 3 WEEKS AT CIEL BRETAGNE, BREST

Science and technology of the sea



© Pixabay, MargnSr

Ciel Bretagne offers English-speaking students with beginner-level French a program of visits to companies and state-of-the-art laboratories (conducted in English), conferences on current and future challenges

facing the engineering professions, and courses in French as a foreign language. The program also includes a wide selection of excursions and cultural visits.

## 12 4 WEEKS AT CLA UNIVERSITÉ DE FRANCHE-COMTÉ BESANÇON - DIJON - BELFORT

Micro, nano & smart technology  
For industrial applications



© Unsplash

The Center for Applied Linguistics (CLA, *Centre de linguistique appliquée*) offers a program of language, cultural, and scientific immersion on the topic of micro, nano & smart technology for industrial applications.

## 16 3 WEEKS AT FRENCH IN NORMANDY AND ESIGELEC

Focus on transport and energy



© Pixabay

Normandy is an historic region, cradle of Impressionism and famous for cheese, whose capital city Rouen, "City of a hundred steeples", boasts a superb architectural and cultural heritage. Yet it is also a region that is resolutely

modern. As a major actor in industrial research, Normandy is recognised throughout Europe as a world-class player in the following sectors, pharmaceuticals, transports, energy and digital applications.



**French ⊕ Sciences is designed for international English-speaking students in Sciences, who may be complete beginners in French: the scientific content is 100% taught in English.**

**This 3- to 4-week program:**

- > Creates a scientific dynamic;
- > Brings together innovators, entrepreneurs, start-up, scientists, educators, and researchers;
- > Gives an overview of French technological know-how in cutting edge sectors such as Sustainable Development, Green energy, Sea Sciences and Technologies, Microtechnology, Biomedical engineering, Transport and Energy.

**French ⊕ Sciences:**

- > Prepares for a longer study project;
- > Develops new competencies for relations with scientists and engineers;
- > Gives benchmarks for careers in scientific cutting-edge fields.

**French ⊕ Sciences:**

- > A research-based educational practice that encourages participants to experiment, share, discover, debate and support a reflection about Sciences and Technology;
- > A unique opportunity to build up a strong network in these scientific fields.

**A complete academic and logistical package:**

- > Airport pickup\*, transportation to and from the language center;
- > Housing (three options), tutoring and monitoring of progress;
- > Medical insurance link provided by Campus France;
- > Assessment and final report.

\* 10 students minimum required



3 WEEKS  
AT  
ACCENT  
FRANÇAIS  
MONTPELLIER



# Focus on SUSTAINABLE DEVELOPMENT

With its long and proud tradition of science and higher learning, Montpellier is internationally renowned for research in the fields of health, agronomy, and the environment. In the field of ecology, the university is constantly ranked among the very best in the world, according to the Shanghai rankings. It is also the birthplace of modern medicine.



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Today, Montpellier is France's leader in research on new agricultural models and environmental management, among other areas. The cities universities and research facilities offer numerous grants and scholarships to international students at the master's, doctoral, and postdoctoral levels.

By bringing together in a single program **innovators, entrepreneurs, scientists, educators, and researchers**, Accent Français and Campus France are leveraging this scientific

dynamic to give international students - France's future informal ambassadors - an appreciation of French technological know-how.

This three weeks program on environmental themes enables participants to:

- > Engage in group discussions of problems and issues confronting scientists and engineers;
- > Reflect individually on potential careers in cutting-edge companies and on the education and training programs most likely to jump start those careers.



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.....  
**An important part of the program consists of site visits innovative enterprises active within a scientific and economic community that shares dreams, aspirations, and motivations:**  
 .....

- > To meet the important challenges of the 21st century in ways consistent with the objectives of sustainable development and the Paris agreement on climate change;
- > To promote innovative agricultural methods and practices that deploy research, education, and training to ensure food security and environmental quality for a global population projected to number 9 billion people by 2050, to manage our natural resources in a sustainable way, to cure chronic and emerging diseases, and to make the transition to societies that are respectful of the environment.



**COURSE CONTENT**

**30 HOURS PER WEEK**

- **French as a foreign language: 15 hours per week**
- > Acquisition and reinforcement

- of linguistic, communicational, and intercultural foundations;
- > Acquisition and reinforcement of grammar and syntax;
- > Practice in written and oral communication.

- **Science and technology module: 15 hours per week**

> A Campus France exclusive + thematic visits.

- **Thematic conferences**  
 Students deepen their knowledge through presentations by experts from the corporate world (including heads of small and medium-sized firms).

*Non-contractual program, subject to change. A minimum of 10 students is required.*

Duration

**3 WEEKS**



Location

**MONTPELLIER**

**PERIOD:** June, July

French ⊕ Sciences & University housing

**€2,000**

French ⊕ Sciences & Host family

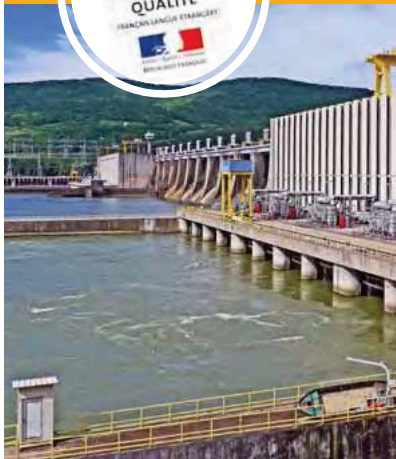
**€2,100**

French ⊕ Sciences & Private apartment

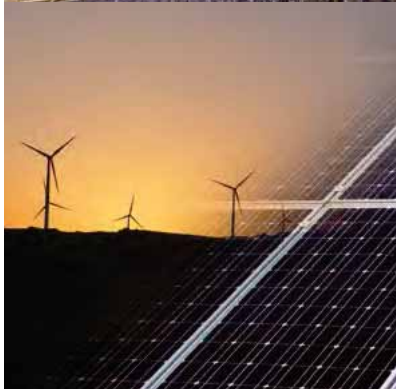
**€2,200**



# 3 WEEKS AT ACCENT FRANÇAIS MONTPELLIER



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## WEEK

# 1

### MONDAY

- > **Morning French course**
- > **Afternoon Montpellier tour**  
Montpellier is voted #1 city in France for its quality of life with 300 days of sunshine per year! This is the place to be to discover historical treasures of the Occitanie.



© Pixabay, Ernelise

### TUESDAY

- > **Morning French course**
- > **Afternoon Visit**  
Generation of electricity from renewable sources: visit to a wind farm (Port la Nouvelle, Aude) or hydroelectric plant (near Vigan, Gard).



© Pixabay, PeterDargatz

### WEDNESDAY

- > **Morning French course**
- > **Afternoon Interactive conference and workshop: Renewable energy**  
**Presenter: Guillaume Marcenac, founder, Enercoop.** Mr. Marcenac is a specialized engineer and director of production for Enercoop, a provider of electricity generated entirely from renewable sources.

**Content:** Theoretical and scientific basics of energy; uses of energy; French electricity networks, markets, and providers; other energy networks; energy transition forecasts and scenarios.

### THURSDAY

- > **Morning French course**
- > **Afternoon Visit Ecological engineering:** visit to Biotope, where ecology is a key part of the environmental approach to land management (Méze).



© Pixabay, Ercosis

### FRIDAY

- > **Morning French course**
- > **Afternoon Drafting of the weekly**  
Logbook of the student, followed by a progress report with a teacher-tutor of the school.

### SATURDAY

- > **All day Excursion to Saint-Guilhem-le-Désert and Lac du Salagou**  
Visit of one of the most beautiful villages of France! Stroll through the narrow streets of the village and discovery of the abbey.  
Let yourself be amazed by the Salagou lake, known for its special red lands!



© Pixabay, tamal66



WEEK

2

MONDAY

> Morning **French course**  
 > Afternoon **Visit**  
**Climate change and ecosystems:** visit to **ECOTRON** experimental facility for the study of the effect of climate change on ecosystems with Jacques Roy, a CNRS research director.



© Pixabay, Bernhard Sierock

TUESDAY

> Morning **French course**  
 > Afternoon **Conference**  
 How do I actually affect the environment?  
**Presenter: Carole Sinfort, research professor at**

**Montpellier SupAgro** and a specialist in pesticides and life-cycle analysis.  
**Content:** Methods of environmental evaluation; the principle behind the ACV method; examples; discussion.

WEDNESDAY

> Morning **French course**  
 > Afternoon **Ideas Debate**  
 The students, guided by their teacher-tutor, will develop their personal reflection and argue their point of view.

THURSDAY

> Morning **French course**  
 > Afternoon **Visit Pesticide research**  
 Visit to a pesticide research center in Agropolis with **Carole Sinfort, research professor at Montpellier SupAgro** and

a specialist in pesticides and life-cycle analysis. [www.irstea.fr/linnovation/equipements-et-plateformes/plateau-reducopol-montpellier](http://www.irstea.fr/linnovation/equipements-et-plateformes/plateau-reducopol-montpellier)



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FRIDAY

> Morning **French course**  
 > Afternoon **Drafting of the weekly**  
 Logbook of the student, followed by a progress report with a teacher-tutor of the school.

SATURDAY

> **All day Excursion to Arles and Saintes-Maries-de-la-Mer**  
 Discovery of this beautiful city listed as UNESCO World Heritage! You will appreciate the old streets and architectures of this city of Ancient Rome. Discover the village of Saintes Maries de la Mer and its legendary church, built between sky and sea and the territory of the Camargue.



© Pixabay, Heins

WEEK

3

MONDAY

> Morning **French course**  
 > Afternoon **Biodiversity**  
 Visit to Villeneuve saltmarsh. [www.cenlr.org/gerer/sites/salines](http://www.cenlr.org/gerer/sites/salines)



© Pixabay, Monicz30

TUESDAY

> Morning **French course**  
 > Afternoon **Conference**  
 Water, the new ecological challenge: combatting pollution and protecting aquatic environments.

**Presenter: Jean-Luc Rivière, coordinator of community relations, Agence de l'Eau Rhône Méditerranée Corse.**

**Content:** Adaptation to climate change; the "de-waterproofing" of soils; conserving water; preserving wetlands etc. Introduction to professional competencies in water and energy; critical analysis of policies in these areas and prospects for the future.

WEDNESDAY

> Morning **French course**  
 > Afternoon **Conference**  
 At the crossroads of nature and advanced technology.

**Presenter: Emmanuel Petiot, managing director, DEINOVE, Grabels.**

**Content:** Reconciling biology and technology in health (new antibiotics) and food(replacing petrosourced with biosourced substances, natural colorants, nutritional supplements, etc.).

THURSDAY

> Morning **French course**  
 > Afternoon **Visit Waste recycling**  
 Visit to the MAERA purification plant in Lattes or the AMETYST methanation site in Baillargues.



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FRIDAY

> Morning **French course**  
 > Afternoon  
 Finalization of the weekly logbook of the student. End-of-course report with a teacher-tutor from the school.

SATURDAY

> **Departure**





3 WEEKS  
AT  
CIEL  
BRETAGNE  
BREST



BRETAGNE 

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# Science & technology OF THE SEA

Ciel Bretagne, in association with Campus France, Technopôle Brest Iroise, and *Campus Mondial de la Mer*, offers English-speaking students with beginner-level French a 3-week program of visits to companies and state-of-the-art laboratories (conducted in English), conferences on current and future challenges facing the engineering professions, and courses in French as a foreign language. The program also includes a wide selection of excursions and cultural visits centered on the theme of “Science and technology of the sea”.

**Ciel Bretagne**

Ecole de français langue étrangère

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Ciel Bretagne is affiliated with the Bretagne Ouest chamber of commerce and industry and has been teaching **French as a foreign language** for 30 years. Each year it welcomes between 700 and 1,000 students from all over the world.

International groups enable all participants to increase their knowledge of French, while excursions allow them to discover the natural and cultural heritage of beautiful Brittany.

**Research efforts in science, information, and digital technology** are particularly intense in and around Brest, which, combined with Brittany's maritime heritage and focus, makes the theme of marine science and technology an obvious choice. The Brest area is **Europe's leading marine research** center in terms of the number of people, institutions, and companies involved in marine science and technology.







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PROGRAM



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The concentration of activity makes Brest one of the world's leading marine research areas. Brest has invested massively in the development of marine resources, for example, through an investment of more than €200 million to attract and support companies active in the field of sea-based renewable energies.

The city's university campus is also focused on the sea, with the European Institute for Marine Studies, a maritime law track in the law school, and ocean-oriented schools of engineering.

Other important actors in the sector - such as Ifremer, the Ecole Navale, Shom, and Cedre - also operate in and around Brest.

It is in this context that Ciel Bretagne has developed a program that enables students to improve their French while exploring one of the **most beautiful regions of France** and advancing their knowledge of one of the most promising fields for the future of our planet.



COURSE CONTENT

30  
HOURS  
PER WEEK

■ **French-language instruction and thematic activities cover 30 hours a week over 3 or 4 weeks:**

- > 15 hours of instruction each week in French as a foreign language, enabling students to acquire or improve their oral and written

communication skills;

- > A program of visits to companies and institutes specialized in the field of marine resources;
- > A program of cultural visits to discover the attractions of the Brittany region.

*Non-contractual program, subject to change. A minimum of 10 students is required.*

Duration

**3 WEEKS**



Location

**BREST**

PERIOD: January, July

French ⊕ Sciences & University housing

**€2,140**

French ⊕ Sciences & Host family

**€2,412**

French ⊕ Sciences & Private apartment

**€2,740**



# 3 WEEKS AT CIEL BRETAGNE BREST



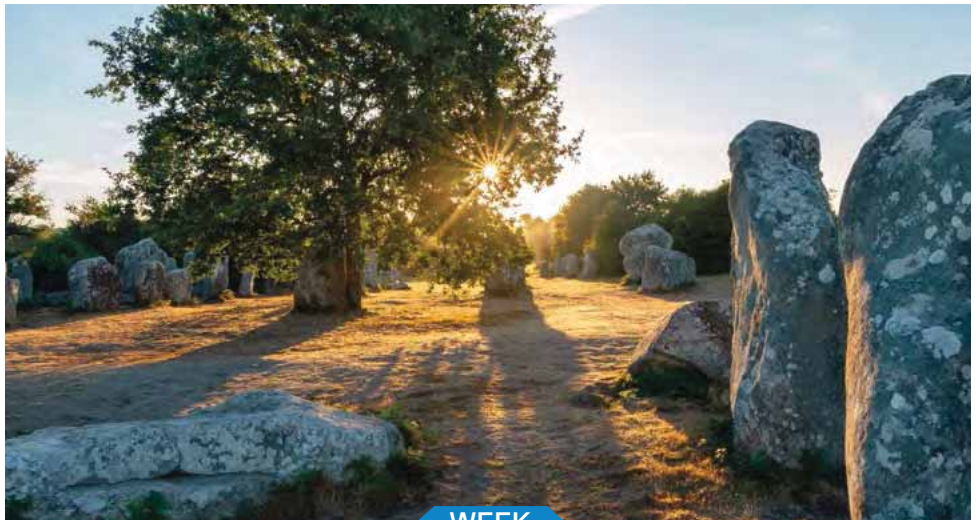
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WEEK

1



## MONDAY

- > **Morning French language study**
- > **Afternoon Visit to Brest: the history of the city viewed through its maritime past**

Brest has always been marked by its proximity to the sea, and that remains true today. Students discover the multiple facets of the city: its ports; the Rade, a sheltered bay of 180 km<sup>2</sup> that provides ideal conditions for water sports all year; its castle; and the famous Rue de Siam.

**Welcome reception at Brest city hall.**



© Pixabay, B. Heschung

## TUESDAY

- > **Morning French language study**
- > **Afternoon Visit to Technopôle Brest Iroise**

A presentation on the region's vibrant maritime culture provides a good view of scientific activity in and around Brest, where 60% of French research linked to the sea is conducted. Brest is home to the highest

concentrations of research and development in Europe in fields such as marine safety and security, development of sea-based renewable energy, and exploitation of marine biological resources.

## WEDNESDAY

- > **Morning French language study**
- > **Afternoon Energy from the sea**

The scarcity and rising cost of resources has focused attention on the diversification of global energy production. This was the challenge that Sabella accepted in 2008 when the company deployed Sabella D03, the first French marine turbine. The experimental marine turbine, 3 meters in diameter, was successfully tested for a year in Brittany off the island of Ouessant. DCNS, another firm involved in marine turbine projects, is planning to deploy seven turbines in the Raz Blanchard, in Normandy, in 2018.

## THURSDAY

- > **Morning French language study**
- > **Afternoon Visit to the University**

In the course of a visit to the **Université de Bretagne Occidentale** students will have an opportunity to meet science students and discuss their projects.

## FRIDAY

- > **Morning French language study**
- > **Afternoon Free**

## SATURDAY

- > **Morning Free**
  - > **Afternoon A Brittany Tour**
- Excursion to **Quimper**, capital of the Cornouaille region and a town of historical and artistic interest. The group will walk through the town's narrow streets, with their distinctive half-timbered houses, stopping to visit the cathedral and the museum of Breton culture.
- Leaving Quimper, the group will stop in **Concarneau** to visit a fish cannery and explore the ramparts and tower of the old town.



© Pixabay



WEEK

2

MONDAY

> **Morning French language study**  
 > **Afternoon Shellfish aquaculture: visit to the hatchery of Tinduff**  
 The hatchery was created in 1983, after fishermen realized that the sea's natural resources were not infinite. The hatchery reseeds the Rade of Brest and works closely with other fisheries. From Granville to La Rochelle, the fisheries buy spat to reseed their beds. The hatchery is currently working on another species: the scallop *Chlamys varia*, in response to the need to diversify the fishery.



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TUESDAY

> **Morning French language study**  
 > **Afternoon Visit to an engineering school**  
 Overview of engineering education in France; encounters with students.



© Pixabay, Jarmouk

WEDNESDAY

> **Morning French language study**  
 > **Afternoon Cedre is a nonprofit set up after the spill from the tanker Amoco Cadiz**  
 Its goal is to improve France's capacity to respond to pollution from accidents.

**Cedre** is responsible for the documentation, research, and experimentation on pollutants, their effects, and how to deal with them.

THURSDAY

> **Morning French language study**  
 > **Afternoon Visit to Océanopolis**  
 An aquarium with European dimensions and a recreational center focused on the oceans. With three pavilions - tropical, polar, and temperate (around Brittany) - there is a vast amount to see! The otter trail is exceptional.



© Pixabay, Visavetrant

FRIDAY

> **Morning French language study**  
 > **Afternoon Free**

SATURDAY

> **Morning Free**  
 > **Afternoon "The Wonder of the West"**  
**Mont-Saint-Michel** stands in the middle of a vast bay surrounded by Europe's most extreme tides.



© Pixabay

WEEK

3

MONDAY

> **Morning French language study**  
 > **Afternoon TechNature Laboratories**  
 Founded in 1986 by Christine Bodeau, a biochemist fascinated with algae, is today France's leader in the design of marine health care products for spas and thalassotherapy centers.



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TUESDAY

> **Morning French language study**  
 > **Afternoon Workshop/role play**  
 On the interaction between nature and human societies in coastal zones.

WEDNESDAY

> **Morning French language study**  
 > **Afternoon The Roscoff laboratory** is a research and teaching institute for marine biology and oceanography. Research areas include the cell cycle of the sea urchin; the biochemistry and development of brown and red algae; the ecophysiology of hydrothermal fauna and their adaptation

to extreme environments; the diversity of phytoplankton and zooplankton; evolution and population genetics; and benthic ecology. Research is being conducted on chemical tracers to understand the circulation of masses of ocean water.



© Pixabay

THURSDAY

> **Morning French language study**  
 > **Afternoon Meeting with a chef**  
 The art of algae in Breton cooking.



© Pixabay, Willwonder

FRIDAY

> **Morning French language study**  
 > **Afternoon Free**

SATURDAY

> **Departure**



**4 WEEKS**  
AT CLA  
UNIVERSITÉ  
DE FRANCHE-  
COMTÉ  
**BESANÇON**  
**DIJON - BELFORT**



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# MICRO, NANO & SMART TECHNOLOGY

## For industrial applications

The Center for Applied Linguistics (CLA) of the University of Franche-Comté in Besançon has partnered with Campus France and the Graduate School EIPHI of the Federal University of Bourgogne Franche-Comté to provide a new program of the French + Sciences in Besançon, Dijon and Belfort. The program will be offering language, cultural and scientific immersion focus on micro and nanotechnology for industrial applications.

UNIVERSITÉ DE  
FRANCHE-COMTÉ

EIPHI-BFC  
GRADUATE SCHOOL  
CROSS DISCIPLINARY SCIENCE  
AND TECHNOLOGY



CENTRE DE LINGUISTIQUE APPLIQUÉE  
UNIVERSITÉ DE FRANCHE-COMTÉ

Designed for English-speaking students, the program includes classes in French as foreign language (FLE) from A1 to B2 level, meetings with researchers, visit of laboratories such as FEMTO-ST, ICB and IMB organized by Phd students and a wide range of excursions and cultural

activities. CLA, founded in 1958, was one of the first university language centers to develop a program of practical foreign language courses based on linguistics research applied to the science of education and active learning methods.

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PROGRAM



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With 4,000 international Student every year, CLA is the biggest university center in France and has been recognized with the highest grade of the label Quality FLE delivered by the french government.

Bourgogne-Franche-Comté is a french tech labeled region through three centers of excellence: Health-Tech network, in Besançon, the Châlon-sur-Saône eco-system, which has joined the IoT and manufacturing network and the FoodTech network, in Dijon.

The Graduate School EIPHI standing for "Engineering and Innovation through Physical Sciences, High-technologies, and cross-disciplinary research" provides the training of the scientific part. EIPHI relies on three internationally renowned laboratories, FEMTO-ST, ICB and IMB covering thematic field such as mathematics, physics, micro nanosciences and systems, computer science, mechatronics, as well as materials and energy. Their research activities can be fundamental or applied, and regularly produce a socio-economic impact. The institutes can rely on high-level technology, equipment and technological platforms.



**COURSE CONTENT**

**30 HOURS PER WEEK**

■ **French as a foreign language: 15 hours per week**

> Acquisition of oral and written communication skills;

> Development of intercultural competence.

■ **Micro, Nano and Smart technology: 15 hours per week**

> Introduction to 12 topics of scientific research at University of Bourgogne Franche-Comté;

> Participation in tutorials and lab works;

> Visits to state-of-the-art laboratories and meeting with researchers;

> Cultural tours.

■ **Student performance will depend on 3 points:**

> Quality of the student's weekly journal and subsequent progress report;

> Degree of participation in program activities;

> Progress in French as a foreign language.

*Non-contractual program, subject to change. A minimum of 10 students is required.*

Duration

**4 WEEKS**



Location

**BESANÇON BELFORT DIJON**

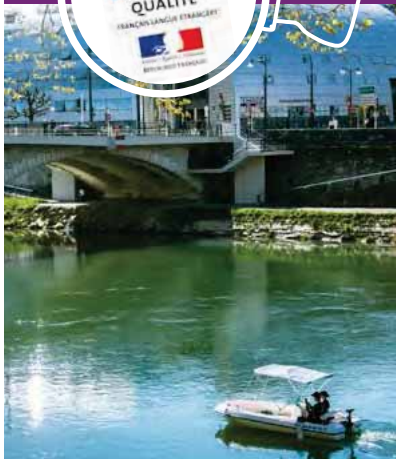
**PERIOD:** January, June

French ⊕ Sciences & University housing

**€1,960**



# 4 WEEKS AT CLA UNIVERSITÉ DE FRANCHE- COMTÉ BESANÇON DIJON - BELFORT



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UNIVERSITÉ DE  
FRANCHE-COMTÉ

EIPHI-BFC  
GRADUATE SCHOOL  
CROSS DISCIPLINARY SCIENCE  
AND TECHNOLOGY



CENTRE DE LINGUISTIQUE APPLIQUÉE  
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## WEEK

# 1

### MONDAY & TUESDAY

#### > Morning French class

#### > Afternoon Smart & Green Mechanics

This course will address the design of innovative solutions for applications such as vibroacoustic control (NVH), Structural Health Monitoring (SHM), Shape Control, or Energy Harvesting for instance. Different subjects such as smart materials with multiphysic behaviors or embedded sensors and actuators in the field of acoustics, heat transfer, or electromagnetics will be covered through lecture, labwork and visit of SMART technological platform.

### WEDNESDAY & THURSDAY

#### > Morning French class

#### > Afternoon Challenges of Micro & Nano Systems

The challenges of the miniaturisation of more and more complex and powerful systems are the subject of this course. From the concept of nano robots

able to perform noninvasive surgeries, to smart Mechatronic systems which invade our daily life, nano and micro structures have a key role in the coming industrial revolutions. The challenges of understanding and mastering the manufacturing at such scales will be addressed. A visit of the Mimento technological platform will be proposed.

### FRIDAY

#### > Morning French class

#### > Afternoon Nano-optics

Photonics permits data communication with large bandwidth, leading to the concept of fiber to the home (FTTH) but is difficult to integrate on a chip because of the diffraction limit. Nano-optics is the study of optical phenomena near or beyond the diffraction limit. This notably includes nanophotonics and plasmonics (also called optics of metals). The objective of this course is to present principles

and applications of nano-optics. We will first discuss fundamentals of nano-photonics and implications to control light matter interaction at the nanoscale with examples ranging from the colors of chameleons to cavity quantum electrodynamics, and perspectives for quantum technologies. Last part will be devoted to plasmonics to overcome the diffraction limit. Visits of FEMTO-ST and ICB research labs will be organised.

### SATURDAY & SUNDAY

#### > Saturday Lausanne

#### > Sunday Excursion to Haut-Doubs

Guided Tour of the Château de Joux, lunch at the typical Franche-Comté inn, boat trip on the Doubs river, and discovery the Saut-du-Doubs waterfall near the Swiss Border.

## WEEK

# 2



### MONDAY

#### > Morning French class

#### > Afternoon Non linear fiber optics

Non linear fiber optics is a very active research area motivated by a wide range of applications, ranging from high-bit-rate telecommunications to novel optical source development for material processing, environmental sensing and medicine. This short course will cover recent advances in modern non linear fiber optics, with a focus on novel optical frequency combs with a wide spectral range

that can be extended to the mid-infrared. These disruptive fiber optic instrumentations enable remote detection of volatile compounds and diagnosis of health pathologies. Visits of FEMTO-ST research facilities will be proposed.

reaching its performance maximum. Unfortunately, this is the consequence of fundamental physical hardware limitations and the restrictions of Turing computing. These limits become particularly relevant when simulating quantum systems and emulating neural networks. In this course we will introduce quantum information processing and neural networks and show that the two concepts share common denominators which are relevant for future hardware implementations.

### TUESDAY & WEDNESDAY

#### > Morning French class

#### > Afternoon Neural Networks & Quantum Computing

The digital electronic computer we got so used to in the past decades is



**THURSDAY & FRIDAY**

> **Morning French class**  
 > **Afternoon Artificial Intelligence & Complex System**  
 Manipulating medical data to infer relevant knowledge while

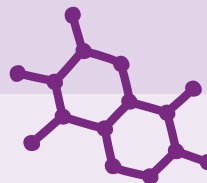
protecting the privacy of the owner patients is at the heart of the Graduate School EIPHI Laboratory FEMTO-ST in collaboration with the Hôpital Nord Franche-Comté. This course will present sufficient components for

the implementation of a privacy protection approach adapted to machine learning, all in a medical context. This short course will propose lab activities.

**SATURDAY**

> **Excursion to Strasbourg**  
 European Capital, headquarter of the European Parliament. Guided tour of the city center (a UNESCO World Heritage site).

WEEK  
**3**



**MONDAY**

> **Morning & Afternoon Green Energy for Mobility**  
 To achieve the reduction of greenhouse gas emissions new technological developments has to be made to succeed in the energy transition. Fuel cells and storage batteries are today very promising alternatives to carbon-based energy sources. Increasing their competitiveness on the economic market is today a priority issue. It should make it possible to respond very quickly to the large-scale use and recycling of electric power sources, both in the context of the expansion of the electric vehicle fleet and in that of stationary applications. This course will introduce the concept of smart grids and focus on the design complex multiphysics systems integrating hybrid electrochemical sources. A visit of FC-Lab will be proposed.

**TUESDAY**

> **Morning & Afternoon French class**  
 .....

**WEDNESDAY**

> **Morning & Afternoon New Material for a Green Planet**  
 Pollution by volatile organic compounds (VOCs) is one of the most important factors of morbidity (6 to 7 million deaths per year according to the UN). There are multiple sources of VOCs (exhaust gas, evaporation of solvents, degassing of plastics, fire smoke, etc.) and, since they cannot be eradicated, there is an urgent need to design efficient and controlled air purification systems, especially in indoor living spaces (schools, workshops, vehicle interiors, etc.). The course will present how new materials can be used to trap by adsorption the VOCs present in the air and ICB research facilities.

**THURSDAY**

> **Morning & Afternoon Quantum Physics & Technologies**  
 One of the main challenges in Quantum Physics is the control of quantum dynamics by external electromagnetic fields. The objective of the course is to present a geometric approach based on the Tennis Racket Effect to manipulate the state of a qubit. It can be shown that the robustness of the classical geometric effect can be transposed to some extent in the quantum world. The fields covered will be the classical rotation of a rigid body, the description of integrable systems by complex geometry and the robust control of qubits.  
 .....

**FRIDAY**

> **Afternoon Mathematics for Applied Physics in Health Science: an application in Health Science**  
 This course aims at describing

how various domains of pure and applied Mathematics and informatics can come together to provide methods and tools for modern medical imaging applications. We will explain the mathematical side of Electric Impedance Tomography, a promising technique for medical imaging which neither exposes the patient to radiation like CT nor requires large, expensive devices as MRI. We will present the necessary mathematical notions from generally disconnected parts of mathematics as geometry, partial differential equations and scientific computing.  
 .....

**SATURDAY & SUNDAY**

> **Excursion to Lyon**  
 > **Dijon & Beaune**



WEEK  
**4**

**MONDAY**

> **Morning & Afternoon Innovative Drugs & Nanotechnologies**  
 Recent years have witnessed unprecedented growth of research and applications in the area of Nanoscience and Nanotechnology. There is increasing optimism that nanotechnology, as applied to medicine, will bring significant advances in the diagnosis

and treatment of disease. Anticipated applications in medicine include drug delivery, diagnostics, cell therapy and production of biocompatible materials. This course present the state of the art of this domain and the research performed locally. A visit of ICB research facilities related to this topic will be proposed.

**TUESDAY & WEDNESDAY**

> **Morning French class**  
 > **Afternoon Time-Frequency Metrology & Quantum Physics**  
 France has always played a key role in the field of time-frequency metrology. In this course we will present the basic tools, the state of the art and the main applications of this domain. Subjects such as oscillators and atomic clocks (in the microwave and optics

domains), quantum phenomena and superradiance will be covered.  
 .....

**THURSDAY & FRIDAY**

> **Morning & Afternoon French class**  
 .....

**SATURDAY**

> **Departure**

3 WEEKS  
AT  
FRENCH IN  
NORMANDY  
ESIGELEC



# Focus on TRANSPORT AND ENERGY

Normandy is an historic region, cradle of Impressionism and famous for cheese, whose historic capital city Rouen, “City of a hundred steeples”, boasts a superb architectural and cultural heritage. Yet it is also a region that is resolutely modern. As a major actor in industrial research, Normandy is recognised throughout Europe as a world-class player in the following sectors, pharmaceuticals, transports, energy and digital applications.



In collaboration with:



Within this context of technical excellence, French in Normandy has partnered with ESIGELEC and Campus France to bring you a 3 week program that combines French language tuition with opportunities to enjoy French culture as well as a series of exciting workshops presenting the latest technological developments taught by experts and specialised speakers from the world of scientific research.

**Did you know that the first ever bank payment made with a card**

**fitted with an electronic chip or the first ever transaction by mobile phone fitted with an NFC chip took place in Normandy?**

Normandy is home to over a hundred companies who are all leaders in the field of aeronautics and spatial technology which together form a cluster called “NORMANDIE AEROSPACE”. Here you will find companies like SNECMA, which builds the Ariane rocket engines, or AIRCELLE, which produces engine blades

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PROGRAM

and the reverse thrust technology used by AIRBUS. Normandy is also the region that represents over 70% of the companies working in R&D in the automobile industry working together here in the world famous MOV'EO cluster. Last but not least RENAULT's first electric motors were designed in the company's Normandy factory at Cléon just south of Rouen!

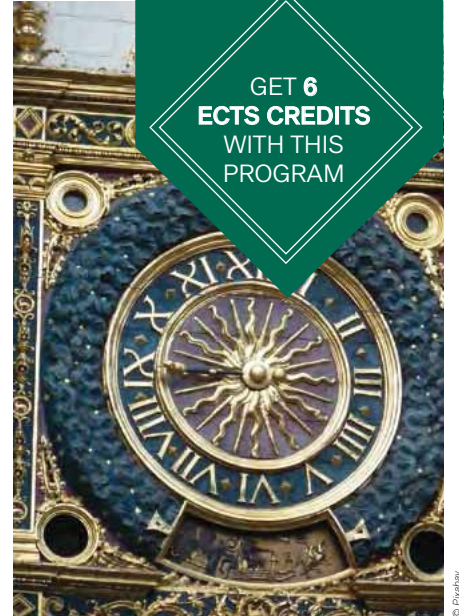
**ESIGELEC engineering school is one of France's most renowned "Grande École"** and is specialized in embedded systems and artificial intelligence, offering courses at first degree, Masters and PhD levels in both French and English.



© French in Normandy



© French in Normandy



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The school has a special research section in embedded systems (IRSEEM) and develops industrial applications using the latest and most innovative technologies for solutions adapted to the automobile, aeronautic and electro-telecommunications sectors.

**French in Normandy**, an award winning French language school, recognized by the French Government Quality label and member of Groupement Fle, International House and IALC, welcomes over 1,500 students every year from more than 60 different countries for both long and short term language courses.



COURSE CONTENT

40  
HOURS  
PER WEEK

- **French as a foreign language: 15 hours per week**
- > Acquisition or enhanced language;

- communication and intercultural skills;
- > Improve grammar and syntax;
- > Improve written and oral expression.

- **Science and technology: 15 hours per week**
- > Hands on sessions in the lab;
- > Build your own smart robot;
- > Be part of a winning team in

competition with French students.

- **Interactive visits and thematic conferences: 10 hours per week**
- > Visit innovative research labs!
- > Meet with experts from the industrial world!
- > Discover Normandy's world leading companies!

*Non-contractual program, subject to change. A minimum of 10 students is required.*



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Duration

**3 WEEKS**



Location

**ROUEN**

PERIOD: March, June

French ⊕ Sciences & University housing

**€2,088**

French ⊕ Sciences & Host family

**€2,165**

French ⊕ Sciences & Private apartment

**€2,238**



# 3 WEEKS AT FRENCH IN NORMANDY ESIGELEC



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In collaboration with:



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WEEK

1

## MONDAY

> **Morning French language course at French In Normandy**

> **Afternoon Interactive conference at ESIGELEC Graduate School of Engineering: New world challenges in Aeronautics & Space**

Main actors, new technologies, strategic issues and job opportunities



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## TUESDAY

> **Morning French language course at French In Normandy**

> **Afternoon Visit ESIGELEC Graduate School of Engineering and make your own smart robot**

Under the supervision of a professor from ESIGELEC, within 6 practical sessions, you will be offered the opportunity to build and develop a smart embedded system, responding to specifications.

**Session 1:** Specifications and assembly of your smart little robot.

## WEDNESDAY

> **Morning French language course at French In Normandy**

> **Afternoon Visit a nuclear power plant in Normandy**  
Discover Nuclear Energy (which is the main source of energy in France) through a conference and the visit of some parts of the installations of a nuclear power plant.



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## THURSDAY

> **Morning French language course at French In Normandy**

> **Afternoon Make your own smart robot at ESIGELEC Graduate School of Engineering**  
**Session 2:** Presentation of the software tools used to develop the programs which will be implemented in the robot, and brainstorming on strategies to be used to respond to the specifications.



© ESIGELEC

## FRIDAY

> **Morning French language course at French In Normandy**

> **Afternoon Visit one of the biggest industrial plant of a famous French car manufacturer**  
Automobile industry is one of the domains of expertise of France. Let's visit and discover a huge industrial plant for engine assembly.



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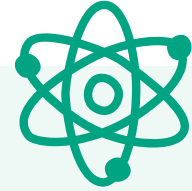
## SATURDAY

> **All day Excursion to Bayeux and to D-Day beaches**



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WEEK

2

MONDAY

- > Morning French language course
- > Afternoon Make your own smart robot at ESIGELEC Graduate School of Engineering

Session 3: Development of the program in C language to be implemented in the robot.



Research and Control of Nuclear, Aeronautic, Automobile, Electronic materials at the atomic scale.



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THURSDAY

- > Morning French language course
- > Afternoon Visit a research lab for Embedded and Electronics Systems at ESIGELEC

4 research platforms in close interaction with the aeronautic, automobile and electronic sectors. Expertise: EMC, Autonomous Navigation, Hybrid Vehicules, etc.



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Session 5: Development of the program in C language to be implemented in the robot.



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SATURDAY

- > All day Excursion by train to Paris to visit "La Cité des Sciences" (La Villette) and free afternoon in the capital of France.



TUESDAY

- > Morning French language course
- > Afternoon Visit of the GPM laboratory (Materials Physic Group) of the University of Rouen Normandie

WEDNESDAY

- > Morning French language class
- > Afternoon Make your own smart robot at ESIGELEC Graduate School of Engineering

Session 4: Development of the program in C language to be implemented in the robot.

FRIDAY

- > Morning French language courses
- > Afternoon Make your own smart robot at ESIGELEC Graduate School of Engineering



WEEK

3

MONDAY

- > Morning French language course
  - > Afternoon Visit of LINEACT Industry of the Future research lab of CESI
- Learn how transport is optimised in factory workshops with the help of robot behaviour simulation and by using Autonomous Guided Vehicles.

Expertise: AGV, Transitec Activities, Game theory, Smart Transport.



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- > Afternoon Make your own smart robot at ESIGELEC Graduate School of Engineering

Session 6: Development of the program in C language to be implemented in the robot.

- > Evening Reception at "Normandy Attractivité" or "Région Normandie" or "Rouen Town Hall"

WEDNESDAY

- > Morning French language course
  - > Afternoon Workshop for Active Learning at CESI.
- Experience Project/Problem Based Learning through a real life case on power generation. Observe and exchange with experts. Present your group's innovative finding at the end of the workshop.

Expertise: PBL, Power Generation...



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THURSDAY

- > Morning French language course
- > Afternoon Visit INSA Rouen Normandie and a research lab CORIA / [www.coria.fr](http://www.coria.fr)



CORIA's research areas cover fundamental and applied studies on reactive and non-reactive flows: two-phase flows, turbulent mixing phenomena,

combustion, plasmas, etc. This research has applications in the fields of energy and transport.

FRIDAY

- > Morning French language course
- > Afternoon Make your own smart robot at ESIGELEC Graduate School of Engineering



Session 7: Tests and competition involving all the robots. A prize will be awarded to the winner team.

SATURDAY

- > Departure

# FRENCH SCIENCES PROGRAMS

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