

# ÉCOLE CENTRALE DE LILLE

THE ● STARTING POINT TO BECOME  
**A GENERAL ENGINEER**



This is where ● starting points get under way!  
Whether swift or slow, not quite as expected or completely new, a start is the beginning of a story – your story.

No one knows exactly where it will take you.  
Our task is to show you the possible paths.  
It's up to you to define the routes and detours...

**ÉCOLE CENTRALE DE LILLE,**

**THE ● STARTING POINT OF YOUR STORY**

# Take a stand for tomorrow's society

**Emmanuel DUFLOS**  
Director-General  
of Centrale Lille

**Céline FASULO**  
Deputy Director  
of Ecole Centrale  
de Lille

Our vocation at the École Centrale de Lille is to **train engineers at the highest level in disciplines across the board**, professionals with strong scientific and technical specializations and the ability to find innovative solutions for the widening range of challenges faced.

**Choosing the École Centrale de Lille means accepting daily challenges, sharing, working on projects**, and acquiring experience in the corporate environment. It places strong emphasis on individualization, a search for purpose, adaptation, and a "test-and-learn" approach, through new educational formats, novel learning methods, and alternation between short and long academic periods. We have redesigned activities, revised course content, and redefined links between our programmes in accordance with our main objectives.

**At the École Centrale de Lille, you are challenged to build a career you are passionate about, on your terms.**



## Our values

- **Boldness:** Dare fearlessly and advance through exploration.
- **Excellence:** Transcend your limits, giving your best.
- **Respect:** Be conscientious and considerate.

## Our mission

**To train multidisciplinary engineers and doctors who drive progress through innovation and integration with the global community.**

## Our vision

To serve the future by developing new talent; to contribute to true well-being while upholding social responsibility, for a better world; and to pass on tools to help resolve life's problems.

- School status: public
- Tuition set by French government: €2,500
- Accredited by French Commission of Engineering Qualifications
- Diploma "*Ingénieur diplômé de l'École Centrale de Lille, de Centrale Lille Institut*"



## The Écoles Centrale group

All five Écoles Centrale (in Lille, Lyon, Marseille, Nantes, and Paris) share the same values, broad curricula, and mission to cultivate excellence in academics and research.

Centrale Lille is fully engaged in the efforts of all GEC member schools to strengthen their alliance through a new phase of development and consolidation of joint activities.

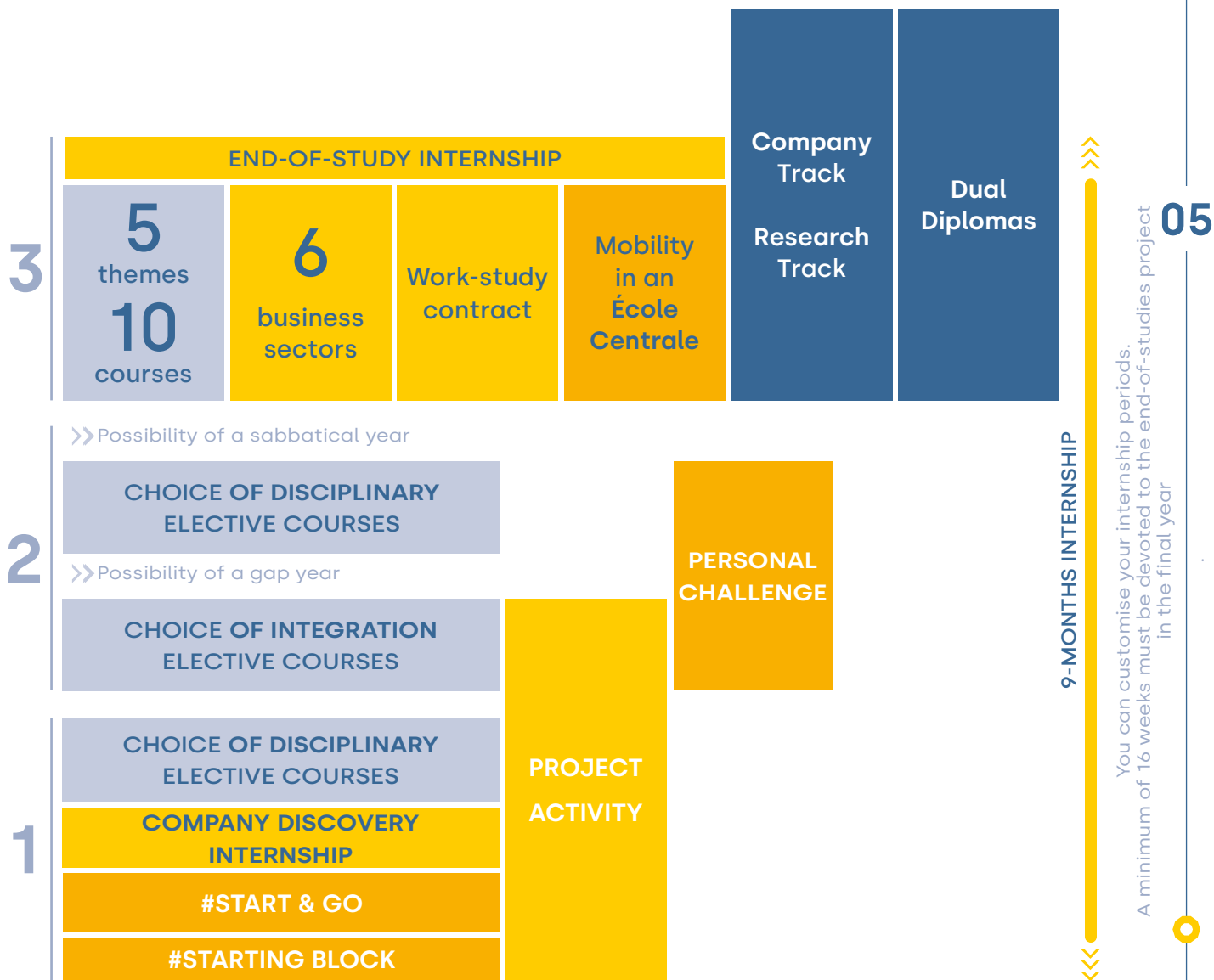
GEC preserves the value of our identity and the vitality of our brand, is a significant source of added value for member schools, and provides them with the operational wherewithal for international growth.



# Chart your own cours starting the first year

You will have the choice **in terms of disciplinary and integration elective courses, challenges, internships, last year options, additional diplomas, dual diplomas, etc.**

**The aim is to further your independence and give you greater choice for your courses, thereby boosting your motivation and ambition.** As engineering students, we see you as future professionals from the very start of your university course, not just students.



# Your first steps as an engineering student

When classes commence, **an eight-week orientation period** gives you the time to clarify your motives in embarking on your engineering studies and **helps you look ahead to your future as a professional, through two novel activities.**

## #starting block

This exploratory period marks a break from your preparatory studies. You will make your own plans, discover occupational specialities in the corporate and research environments, develop your unique vision of the engineering profession, and **learn about the attitudes expected of an engineer on the job.**

## #start & go

During this six-week team project focused on one of five multidisciplinary themes (energy; data science; design and environment; robotics; and arts and science) you and three others will **be exposed to new research fields and discover all the opportunities you will offered during your time at Centrale Lille.**





## Electives first and second years

**Core courses give you scientific foundations that will serve you when taking specialized and multidisciplinary elective courses in fields that interest you. Electives let you personalize your curriculum and gradually refine your professional plans.**

### 56 disciplinary electives

During **semester 6**, you will take **six disciplinary elective courses**. You must select one elective from each of the five academic areas. The sixth elective may be chosen from any of the five areas.

During **semester 8**, you will choose **another six electives**, from any area you like, to broaden your knowledge and build up your profile as a multidisciplinary, or delve deeper into a particular area. First- and second-year students are offered the same range of electives, and some are taught in English.

### 19 integration electives

For **semester 7**, you will select **two integration electives** that will expose you to the complexity of interactions between multiple subject areas. Faculty from several departments jointly contribute to the syllabi for these elective courses.

**Every four weeks, course work alternates with intense challenges** completed under the guidance of teaching staff: Imagine&Make projects, business-focused serious games, and activities building leadership in extreme situations...



### Project activity

**Right from the onset of your training and for a period of 18 months, you will work in groups of 12 to 15 in the style of a small business.**

Your team carries out a project directly related to a client (company or laboratory) on topics as diverse as 3D printing or metal recycling.

**An innovative approach**

**to collective work**

**that represents high added value**

**in the eyes of your future employers.**

#### MORE ON ELECTIVES



### Bachelor's degree ("licence") in mathematics

In addition to your first-year courses, you can register at the University of Lille, located on the same campus as the École Centrale de Lille, to take a bachelor's degree in mathematics. A specific course arrangement allows you to follow this degree for two semesters (corresponding to S5 and S6).

# Opportunities to be seized for learning

## Challenging yourself

Challenges provide an opportunity to exercise your freedom and assert your personality! **During your second year, you will participate in a challenge, and set your own objectives for it.** Completed in parallel with your course work and other projects, this personal challenge will develop your willpower and talent. The aim is to encourage you to be ambitious, leave your comfort zone, and exceed your limits.

The keywords here are passion, desire, commitment, effort, energy, ambition, and pride. You will select a challenge linked to a theme of your choice.



## A gap year or sabbatical

You have the opportunity to take a gap year or sabbatical to get prolonged work experience, clarify an idea for study or work, or pursue a personal project.

During such a gap year or sabbatical, you'll have to adopt a reflective approach: you should think about the different experiences you undertake, how you feel about them, how you assess them, and how all this guides the rest of your studies more clearly..

**The gap year can be taken between semesters 7 and 8, and the sabbatical between semesters 8 and 9, or by spending two years to complete your third year of study.** A school tutor will accompany you throughout this experience.

## Semester 8 abroad

You have the opportunity to apply for international mobility with one of our international partners in Semester 8.

## Languages: develop your potential!

**Student must take classes in English and a second modern language throughout their studies. They may additionally study a third modern language, such as Chinese, German, Italian, Japanese, Portuguese, or Spanish.**

All students have access to the GoFluent platform, which allows them to improve their skills in a language of study, or discover a new one. Engage in fun learning activities, from any location.



# 5 themes 10 courses to address current challenges

In your third year of study, you'll select a pathway to deepen your knowledge. You choose it from the ten courses offered, in one of the five themes presented. The aim of this programme is to steer you towards a field you're interested in. This makes it easier for you to get into the job market in a sector you love.

## Theme: from strategy to data management



### Course Data Science & artificial intelligence

This sequence will make you a data specialist able to apply mathematical models and algorithms produced through scientific research to transform raw data into valuable knowledge. Your goal will be to tap into the economic potential of data to create added value.

### Course Modelling & enterprise architecture

The role of the enterprise architect is to master the complexity of a company's information system and make it more agile. This sequence will teach you methods, tools, and best practice in modelling to align such a system with corporate strategy.

## Theme: smart systems

### and smart environments



#### Course Intelligent systems & advanced communication networks

In addition to simultaneous high speed transmission of voice, image, and other data over landline or mobile networks, we will be seeing the rise of miniature, autonomous, distributed and communicating sensors. You will implement solutions for onboard and mobile systems, and both digital and wireless communications.

#### Course Networks for the futur & ambient intelligences

The increasing integration of information exchange and processing technology offers not only control capabilities but the possibility of creating automated systems that are more and more efficient, in terms of both time and energy, and autonomous—or alternatively, able to function in a network to accomplish certain tasks.



## Theme: sustainable



### construction and energy



#### Course Construction & sustainable materials

From the drawing board to the work site, you will be balancing technical, financial, and human variables as you apply best practice in the field of construction, where each site is unique and each building a prototype. You will learn to factor in all risks, ensuring people's safety, applying semiprobabilistic techniques for the design of structures offering protection from accidents and harsh weather conditions, and assessing socioeconomic aspects.

#### Course Energy, electric mobility & smart networks

By presenting a bottom-up approach to energy management that begins on the lowest habitat level and works up to the scale of large urban centres and vast regions, this sequence will give you an appreciation of the challenges you must overcome in this field and of the wide range of solutions available - including renewable energy applications, new means of producing electricity, AC/DC network coupling, storage systems, and smart grids.

## Theme: The industry

### of the future



#### Course Sustainable design products and production

Apply the model of the circular economy to design environmentally friendly products that are sustainable and socially responsible. You will be attentive to how renewable, repairable, and reusable each product is.

#### Course Industry 4.0

Become an engineer proficient at adopting new technologies for industry, logistics, and supply chain management. Your goal is to ensure the eco-friendly and sustainable manufacture of a product that meets customer expectations, while guaranteeing an open yet secure production system.



## Theme: engineering

### & health



#### Course Patient Care Organisation

This course is focused on health care organisations. You learn to meet the new needs of the patient-centric medical world (patient circuit, funding, pharmacy 4.0, medical robotics, digital twins, remote surveillance, medical IoT, etc.).

#### Course Product Care Design

This course focuses on the design of care tools. You learn to meet the medical world's new needs on subjects such as: artificial intelligence and omics approaches, medical imaging, biomaterials, biomolecules, drug design, access to the medical products market, etc. within the companies that design these tools.



# Complete your course with one of our 6 business sectors...

Led by professionals, these occupational courses reflect the principal occupations of Centrale graduate engineers and apply to all business sectors. 150 hours are dedicated to the professional paths.

## Business sector Entrepreneur

...to go into the field and confront reality (the reality of customers, suppliers, and partners) **to refine and develop your plans** in accordance with real feedback, not theory. You are to apply an interactive approach reflecting an empirical perspective of learning through action.

## Business sector Consultant Auditor

This professional path will **expose you to the various aspects of the consulting and auditing professions** as determined by types of activities and end clients. You will benefit from the experience of corporate professionals and familiarize yourself with their work and project management methods.

## Business sector Researcher

“Contrary to what I once thought, scientific progress did not consist simply in observing, in accumulating experimental facts and drawing up a theory from them. It began with the invention of a possible world, or a fragment thereof, which was then compared by experimentation with the real world. And it was **this constant dialogue between imagination and experiment** that allowed one to form an increasingly fine-grained conception of what is called reality.”

François Jacob, Biologist, physician,  
Winner of the Nobel Prize in Medicine  
and Physiology

## Business sector Production and operations manager

To enhance the performance of companies in any sector, you will be trained in production planning and monitoring, as well as the design and optimization of production processes, without neglecting the human element.

Today's **supply chain professionals are decision-makers of a new breed who are equally involved with strategy and operations**, have a comprehensive vision and sense of leadership, and are no longer simply focused on cost-cutting but must also be sources of value creation and innovation.

## Business sector International project manager

To be competitive and innovative, small and large companies alike must demonstrate operational agility. Learn to apply **a project engineering approach in any organization and business sector**.

## Business sector Innovation and development manager

Through this professional path you will learn **techniques to inspire creativity and create value** through innovative technology, processes, and business models—and thereby fulfil user expectations.





## ... or opt for a work-study format

You can choose to spend your third year off campus as a company employee, for 12 to 14 months, using time otherwise reserved for professional path course work.

**36**  
weeks  
on the job

**18**  
weeks  
on campus

+ During that period, no tuition is due and the company pays you a monthly salary (at least 80% of the minimum salary in France).



## ... or opt for a one-year mobility

### Within the Écoles Centrale group

You can spend your last year at another École Centrale— in Lyon, Marseille, Nantes, Paris, or Casablanca (Morocco).



CENTRALE  
NANTES

Centrale  
Méditerranée



# Dual diplomas

a way to stand out from the crowd  
in the eyes of recruiters

The École Centrale de Lille relies on academic, research, and business partners to offer you further structured curricular options, including two **special tracks** as well as **dual diplomas**, completed **in France or abroad**.

## **Engineering and Management**

With our partner **EDHEC Business School**, you can choose from three specializations: Business Management, Financial Economics, or Global Economic Transformation Technology.



## **Master in Digital Societies**

Jointly with **Sciences Po Lille**, this programme is based on a multidisciplinary education in both the engineering sciences and the social sciences (e.g., law, economics, and political science), to tackle the greatest issues raised by the digital revolution.

## **Engineering and Architecture**

Combining studies in engineering and architecture helps you to provide such solutions. After two years at the École Centrale de Lille, you spend another two at **Mons University (Belgium)** or **Milan Polytechnic (Italy)**.

## **Master Aeronautic & Space major turbulence**

This two-year programme aims to equip engineers, physicists, and mathematicians with the theoretical and experimental expertise in turbulence to work in any industrial or research environment.

## **Master data science**

Data science adopts a multidisciplinary approach and spans an extremely diverse array of sectors, including transport, health, banking and insurance, marketing, civil engineering, and hi-tech industry ('industry 4.0'), as well as a firm grasp of machine learning and its applications.

## **Master biomedical engineering**

Double-degree holders lead the pack in the fields of biomedical imaging, surgical devices and implants, exoskeleton design, and information processing (general or patient-specific).



## **Erasmus +**

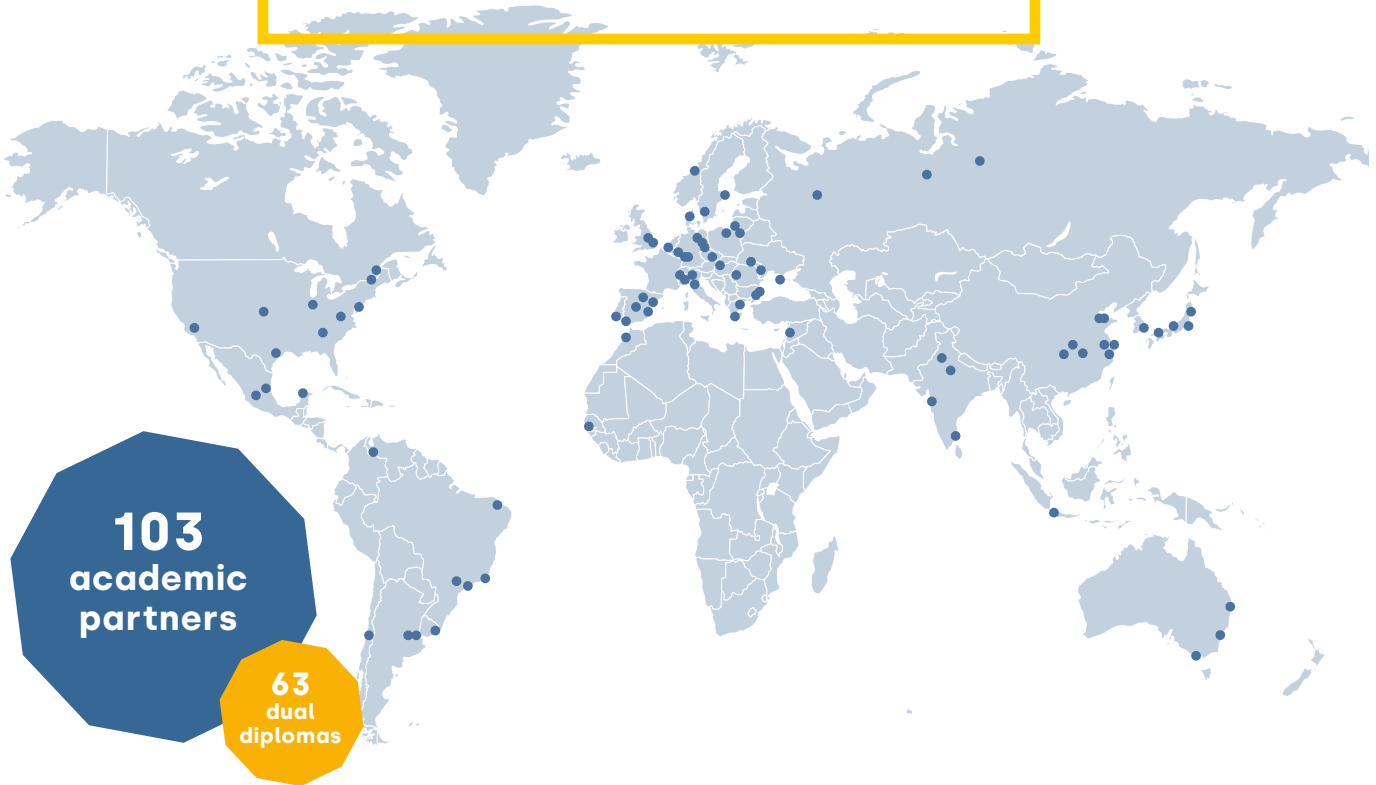
The École Centrale de Lille is a signatory of the European Union's Erasmus+ charter and is part of this mobility programme



# International dimension

100 % of our graduates have spent at least a semester abroad

**32 destinations**



**Dual diplomas abroad: Engineer - International Master's degree from one of our academic partners**

- #RENEWABLE ENERGY
- #AERONAUTICS
- #BIOMEDICAL
- #FINANCE
- #AEROSPACE
- #BIOTECH
- #NANOELECTRONICS
- #PHARMACEUTICAL
- #DATA SCIENCE
- #CYBERSECURITY
- #WIND ENERGY
- #AUTOMOTIVE
- #BIOINFORMATICS
- #PHYSICS
- #ARTIFICIAL INTELLIGENCE
- #ROBOTICS

- |  |           |  |                |  |         |  |          |  |                |
|--|-----------|--|----------------|--|---------|--|----------|--|----------------|
|  | Argentina |  | China          |  | Hungary |  | Norway   |  | Sweden         |
|  | Australia |  | Colombia       |  | India   |  | Poland   |  | Switzerland    |
|  | Austria   |  | Czech Republic |  | Italy   |  | Portugal |  | United Kingdom |
|  | Belgium   |  | Denmark        |  | Japan   |  | Romania  |  | United States  |
|  | Brazil    |  | Finland        |  | Lebanon |  | Russia   |  |                |
|  | Canada    |  | Germany        |  | Mexico  |  | Slovakia |  |                |
|  | Chile     |  | Greece         |  | Morocco |  | Spain    |  |                |

# A different take on international experience

## International research track

This track is **ideally suited for an easier transition** to later doctoral studies. You spend at least **one semester being introduced to research in an international partner laboratory**. Then you will cap your studies with a thematic course sequence during your third year, all the while pursuing your research work on a part-time (and later full-time) basis in a laboratory. Those who decide to carry out this research on the topic of their third-year studies may opt for the PhD fast track, to advance their dissertation date.

## Company track

The company track puts you in the thick of the action, **within a partner company, complementing your professional path course work with real experience on the job**. You can discover two or three different professions inside the company. At least one of these professions must have **an international component**. Upon finishing this one-year initiation into corporate life and professions, you will have a clearer vision of your own skills. During your last year, you may follow a sequence of advanced studies and complete a capstone project, or opt for a work-study arrangement.



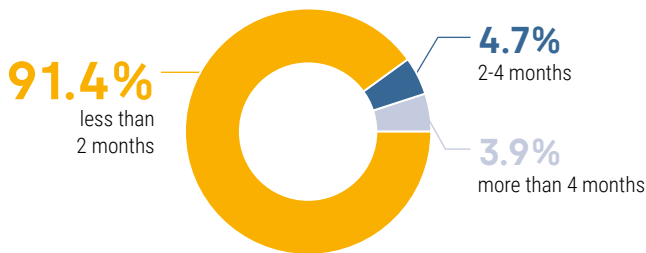
### Advancing professionally together: tribe spirit!

Centrale Lille Alumni organizes 150 events each year and helps you transition to the professional world through mentorship programmes and career workshops. It constitutes a network for mutual assistance and encouragement, and it promotes the personal and professional development of all member alumni, who hail from 80 countries.

# Jobs and careers in 2021



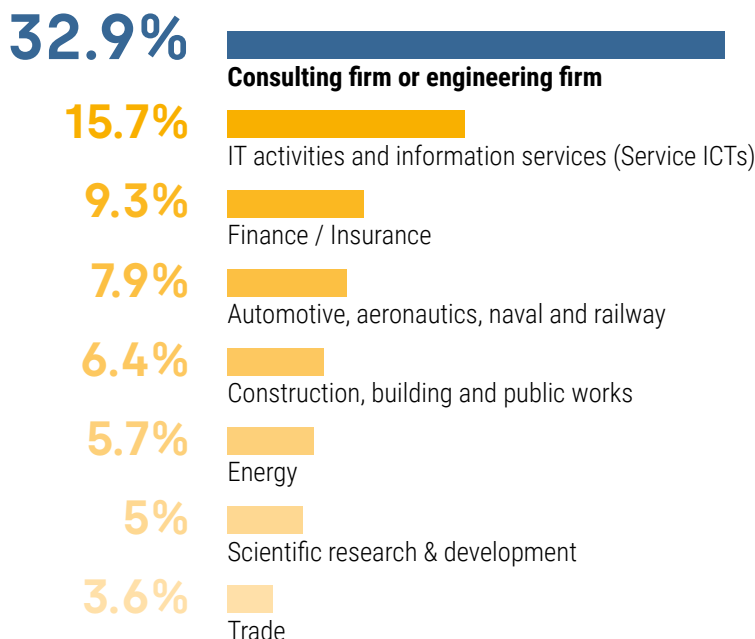
**43 k€ gross/year**  
Median salary upon hiring



**52.5%**  
Île-de-France

**24.9%**  
Other regions

**22.6%**  
Abroad



- Research & Development Engineer
- Mechanical Design Engineer
- Works Engineer
- Business Analyst
- Design Engineer
- Data Scientist
- Product Manager
- Technical and Quality Manager
- Performance Improvement Consultant
- Software Engineer
- Engineering Project Manager

# Un environnement de qualité et d'excellence

Training and research are the foundation of all Centrale Lille's missions. They contribute to the establishment's international recognition **in four fields.**



## Digital

- Transformation of the energy system
- Low-carbon energies
- Improving energy efficiency
- Sustainability and energy security



## Energy

- Digital technology for the benefit of people
- Energy transition
- Cities of the future: mobility & transport
- Industry 4.0



## Environment

- Focus on alternative resources
- Development of cleaner and more efficient processes and machines
- Human environment



## Health

- Medical devices for early and predictive diagnosis
- Minimally invasive precision implants and therapies
- Optimisation of hospital logistics

## Research laboratories

Fundamental and applied research strengthen the school's reputation at home and abroad, making it a prominent actor in research at the service of the economy..

### Centrale Lille research professors contribute to research conducted at 9 Lille based laboratories:

- **CRISTAL**, UMR 9189, Lille computer science, signal processing, and automation research centre
- **IEMN**, UMR 8520, Institute for electronics, microelectronics, and nanotechnology
- **Institut Pasteur de Lille**
- **LMFL**, UMR 9014, Lille Kampé de Fériet fluid mechanics laborator
- **L2EP**, EA 2697, Lille power electronics and electrical engineering laboratory
- **LaMCUBE**, UMR 9013, Multiphysics and multiscale mechanics laboratory
- **PAUL PAINLEVÉ**, UMR 8524, Mathematics laboratory
- **UCCS**, UMR 8181, Solid-state chemistry and catalysis research unit
- **UMET**, UMR 8207, Materials and Transformation Unit



### Our research and services provided to industrial firms rely on:

- **6 EQUIPEX and EQUIPEX+:** facilities funded through the French government's **Investissements d'Avenir R&D programme**—namely, REALCAT (high-throughput catalyst screening), Leaf (flexible electronics), Excelsior (nanocharacterization), and IrDIVE (interactive digital visual environments).
- **10 experimental platforms :** MEMS and HF Characterization, Distributed Energy, FIRE-RESIST, Casting, HT-SMARTFORMU, Health Engineering, PPTS, Optical Metrology (MEOL), Micro-Nano Fabrication, Electric Mobility and Electricity Generation, UPCAT, Wind Tunnel Experimentation and Microfluidics (CONTRAERO), and X-Ray Microtomography (ISIS 4D).

## Training for research and by research

Centrale Lille offers **several master's degrees, including international degrees**. You can also choose the **international research track** for valuable experience in the field of research. This set you on the path **for later doctoral studies**, should you desire to pursue them.

### 3 doctoral schools

- SPI-ENGSYS 632, Engineering and Systems Sciences
- SPI-MADIS 631, Mathematics-Digital sciences and their interactions
- SMRE 104, Material, Radiation and Environmental Sciences

### 16 master's programmes in 10 specialities

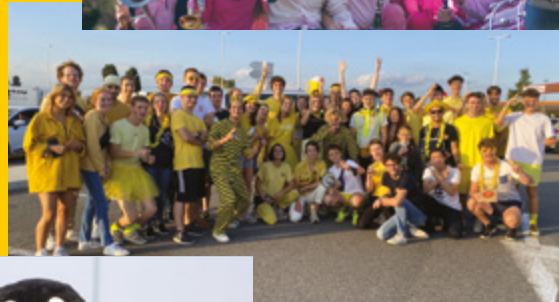
- Health Engineering • Mechanical Engineering • Nanosciences and nanotechnologies • Networks and Telecommunications • Data science • Aeronautic & space • Automation and Robotics • Automation and Electrical Systems • Chemistry • Civil Engineering

# A diverse and vibrant student life



## Clubs and associations

École Centrale de Lille warmly encourages students to join any of **the 70+ clubs that enliven** extracurricular life on campus. The sports and musical groups, cultural and culinary happenings, and Junior Enterprise activities on offer are an invitation for students to apply their talents or discover new passions. At the start of the academic year there is a wide range of clubs to choose from.





# Campus

## Around the school

You can take advantage of many services on campus: **a learning centre, four dining halls, sports facilities, and a health centre.** Nearby off-campus you'll find a swimming pool, shopping centre, restaurants, and cinemas.

## Getting here

The École Centrale de Lille is on the Villeneuve d'Ascq science campu, 15 minutes from the centre of Lille, just opposite the 4 Cantons-Stade Pierre Mauroy metro station (Line 1 terminus).

## Student residence

**The Léonard de Vinci residence is reserved for École Centrale de Lille students, ten minutes away from campus by foot.** Two types of accommodation are offered at the 'Rez': 18-20 m2 apartments for individual students, including a bedroom, a kitchenette, and a bathroom with a shower and toilet; and 40-m2 apartments each housing two students, including two bedrooms, a kitchenette, a separate toilet, and a bathroom with a shower.

**The Rez is a friendly environment** where residents treat each other like family. Many events are organized there to bring students together!



- € **From €413** including service charges (€301 with french APL, €257 if you're a grant-holder)\*
- @ Internet access
- 🧺 Launderette
- 🏋️ Gym
- 🔒 Safe accommodation
- P Private car park
- 👤 Student common room
- ⚽ Football pitch

\*in 2021

## Life in Lille

The city of Lille is part of the larger Lille European Metropolis (MEL) and centrally located between Belgium, Germany, Luxembourg, the Netherlands, and the United Kingdom.

**It is a major economic and cultural hub of northern Europe.**

Hauts-de-France ranks third among French regions in terms of number of businesses, size of workforce, and investments, and second for the number of corporate head offices. It is home to 50 companies that are world leaders in their respective fields



Lille is a dynamic metropolis with a young population, **including over 110,000 students.** Over 35% of the population is under 25, making Lille the youngest city in France!

Lille is a festive and welcoming city offering its residents a flourishing cultural scene. You will find everything you need to **enjoy an unforgettable student experience.**



# How to apply to École Centrale de Lille ?



## Concours

### **Concours Centrale-Supélec** for post secondary preparatory studies

Enrolment to take the competitive examination is possible from the start of December to the start of January. The written examinations take place in May. The oral examinations for eligible candidates take place from the end of June to the end of July. Admission results are available on the SCEI website (French online service for competitive examinations for engineering schools).

More information: [www.scei-concours.fr](http://www.scei-concours.fr)

### **Concours "Banque PT"** in physics and technology

This competitive examination based on common tests is open to students on intensive foundation courses in physics and technology (PT) taken in preparation for admission to France's top engineering schools. Enrolment takes place from the start of December to the start of January. The written examinations take place in May.

More information: [www.scei-concours.fr](http://www.scei-concours.fr)

### **Concours ATS**

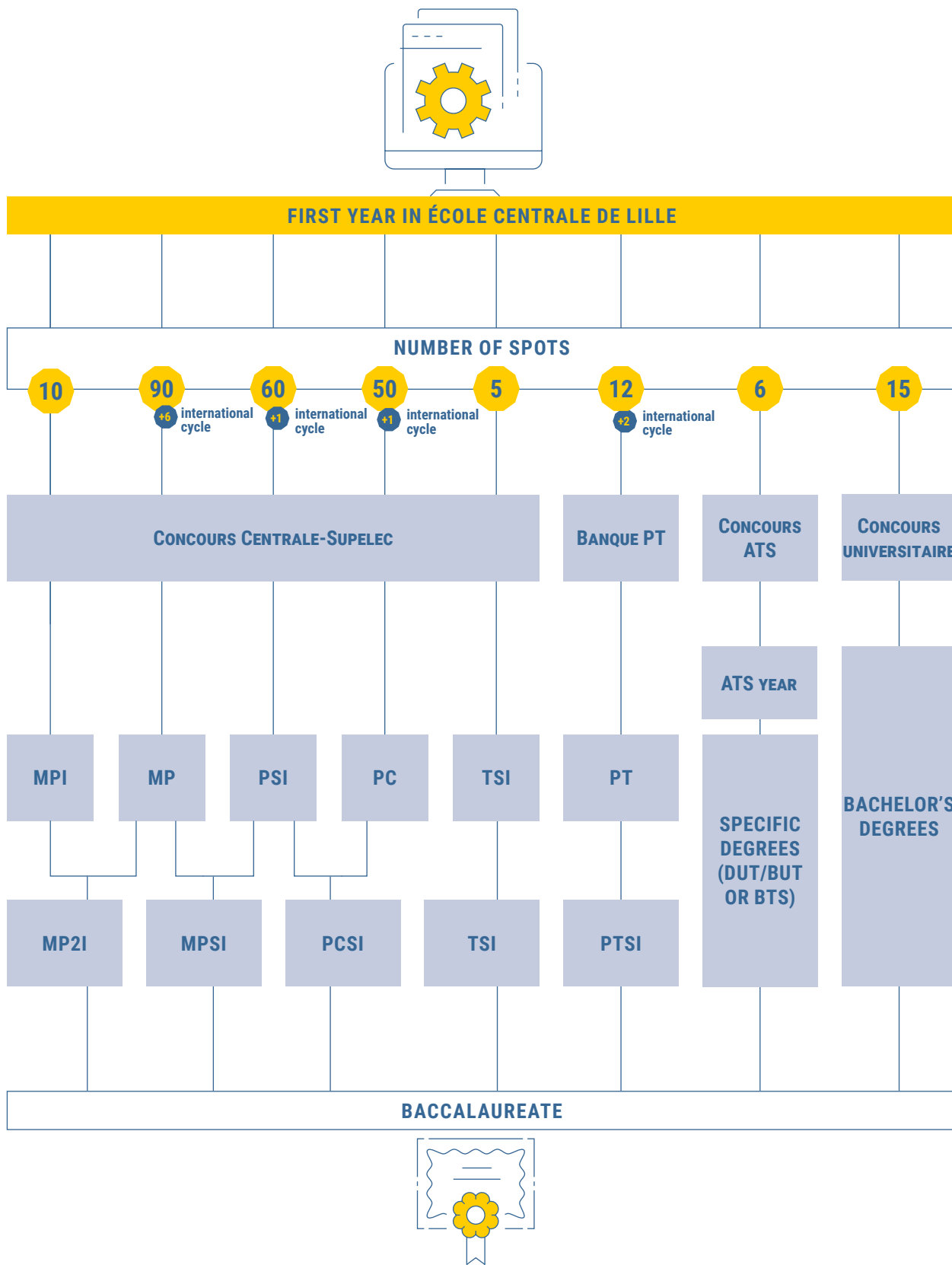
This competitive examination is open to students who hold a specific degree (DUT/BUT or BTS) and who have completed one 'ATS' year on the specialised French preparatory course for engineering schools. Enrolment takes place from the start of January to the start of March.

More information: [concours.ensea.fr](http://concours.ensea.fr)

### **Concours "universitaire"** for scientific bachelor's degrees

This competition is aimed at students in the final year of a Bachelor's degree ("Licence"). The admission procedure comprises two stages: a pre-selection based on the applicant's file, and a written test.

More information: [www.scei-concours.fr](http://www.scei-concours.fr)





FOR STUDENT FAIRS,  
MORE INFORMATION:  
[ECOLE.CENTRALELILLE.FR](http://ECOLE.CENTRALELILLE.FR)



**Cité Scientifique - CS 20048**  
**59651 Villeneuve d'Ascq Cedex - France**  
**[contact.ecole@centralelille.fr](mailto:contact.ecole@centralelille.fr)**

**[ecole.centralelille.fr](http://ecole.centralelille.fr)**