Explore Centrale Lille: Double Degrees and Exchange Opportunities

Mathieu Thomas de la Pintière — Sept. 2022
Living in Lille:
Choose the Beating Heart of Europe
Lille – A central location in Europe

- 38 min. from Brussels
- 1 hr from Paris
- 2 hrs from London
- 3 hrs from Amsterdam
- 50 min. from CDG Airport
Live in Lille, Discover France & Europe
Lille – A young and vibrant city

- Capital of Hauts-de-France Region
- 1.2 million inhabitants
- Rich historical heritage
- 120,000 students (3rd city in France)
Lille – A Business and Innovation Hub

- **1st region in France for Industrial Investments**
- **2nd region in France for Foreign Investments**
- **5 Centres of Excellence & Innovation**
- **EuraTechnologies: 1st Start-Up Incubator in France, 3rd in Europe**
- **Major actors of French Research & Innovation:** Institut Pasteur, CNRS, ONERA, INRIA, INRA, Ifremer…
Centrale Lille:
Pioneers of Engineering for 170 years
Écoles Centrale Student Recruitment

- 715 000 High School Graduates
- Two-year intensive Prep Course (Top 12.2% stud.)
- National-wide Competitive Exam
- Top 5%

Diagram of higher education in France:

- Years after Baccalauréat
  - European degree and credits (ECTS)
  - Doctorate
  - Master’s degree
  - Bachelor’s degree
  - Baccalauréat

Non-selective university curriculum
Top-level Engineering Schools
Public Higher Education & Research Institution
Tuition Fees fixed by the Ministry
(EUR 2500 per year)

Diplomas Accredited by the Engineering Degrees Accreditation Committee (CTI)
Graduate Engineer from Centrale Lille Institut
# Centrale Lille Departments & Programmes

<table>
<thead>
<tr>
<th>ÉCOLE CENTRALE DE LILLE</th>
<th>ENSCL</th>
<th>IG2I</th>
<th>ITEEM</th>
<th>MASTERS/DOCTORAT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student</strong></td>
<td>Student/Apprentice</td>
<td>Student</td>
<td>Student</td>
<td>Student</td>
</tr>
<tr>
<td>Following a Grandes Écoles preparatory course</td>
<td>Post-baccalaureate, or post-baccalaureate with two years in higher education</td>
<td>Post-baccalaureate</td>
<td>Engineer manager entrepreneur</td>
<td>Bachelor’s degree / Master’s degree</td>
</tr>
<tr>
<td>General training</td>
<td>Chemical Engineer</td>
<td>Engineer for intelligent and interconnected systems</td>
<td>In partnership with SKEMA Business School</td>
<td>16 masters courses, 6 of which are taught in English</td>
</tr>
<tr>
<td>The school is part of the Écoles Centrale group</td>
<td>Member of the Gay-Lussac Federation</td>
<td></td>
<td></td>
<td>3 doctoral schools.</td>
</tr>
<tr>
<td></td>
<td><a href="http://ecole.centralelille.fr">ecole.centralelille.fr</a></td>
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</tbody>
</table>

## Research

- [CRiStAL](http://cristal.centralelille.fr)
- [iEMN](http://iemn.univ-lille1.fr)
- [L2EP](http://www.l2ep.univ-lille1.fr)
- [LaM CubE](http://lam.cubе.univ-lille1.fr)
- [UCCS](http://www.uccsENCES.fr)
- [UMET](http://www.umet.fr)

7 research centers
Centrale Lille’s Facts and Figures

380 permanent staff
Of which 228 faculty-researchers

+2200 students
Of which 2000 engineering students

417 graduates

100+ international partners

45 patents
since 2010

2 International Research Project

* Key figures 2021
Centrale Lille, a proud member of the T.I.M.E Association

Top International Managers in Engineering

- **T.I.M.E. (Top International Managers in Engineering) association:** 59 Engineering Schools & Technological universities in 25 countries
- **Oldest European engineering network** => created in 1989 at Ecole Centrale Paris by 16 founding members (each a leading engineering institution in its own country)
- Now includes members from Australia / China / Japan / North + South America, etc.
- A « Network of Excellence » for graduate student exchanges and Double Master (and PhD) Degrees
- Summer schools / EU projects / ...
Campus Facilities and Equipment
Student Clubs and Activities at Centrale Lille

70 CLUBS AND ASSOCIATIONS BY CENTRALE LILLE

Focus on Research at Centrale Lille
Research Flagships

**Environment**

→ alternative resources (bioeconomy, circular economy, recycling)
→ cleaner and more economical processes and machines (hybrid catalysis, electric machines)
→ the human environment (air quality, noise reduction, fire safety)

**Energy**

→ low-carbon energy sources
→ improving energy efficiency
  → taking into account sustainability constraints
  → taking into account energy security constraints

**Health**

→ medical devices and implants
→ early, predictive diagnosis, accessible to the greatest number of people
→ low-invasive personalized precision therapies
→ optimization of hospital logistics and the care pathway to the home

**Digital**

→ towards the future of information and communication sciences and technologies
  → at the service of people
→ at the heart of the other challenges
  → climate change, energy transition, health, cities of the future, mobility - transport, industry 4.0
→ micro-nanotechnologies, computing and AI, automation, signal and image processing, robotics
Major Fields of Research

- Fundamental informatics, Computer Eng.
- Automatic Control
- Signals
- Micro-Nano-Technologies
- Functional Electronics
- Acoustics & Optoelectronics
- Microfluidics
- Electrotechnics
- Power Electronics
- Fluid Mechanics
- Civil Engineering Mechanics
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Equipments of Excellence

REALCAT (High-throughput catalysis)

NANOFUTUR (Nanotechnologies)

LEAF (Laser processing for flexible electronics)

EXCESLSIOR (Nanoscience charac.)

TIRREX / PRETIL (Robotics)

IRDIVE (Immersive Tech)
LamCube Experimental Facilities

- Study of the turbulent boundary layer with large Reynolds number
- Flow control on 2D models
- Test Vein: 1 m x 2 m, length 20 m
- Max Velocity: 10 m/s
LamCube Experimental Facilities

- **ISIS4D RX μtomography**
- **Tribology - braking**
- **Multiaxial tests**
- **Foundry**
Centrale Lille Research and Innovation Day

- Presentation of our labs to students & partners
- Next edition: 2022 October 18
École Centrale de Lille
Curriculum
Specifics of the 3-year General Engineering curriculum

Create a meaningful journey!

- **Highly selective & demanding**
  Students recruited from the best prep schools in France and abroad

- **Strongly individualised**
  Exhaustive course offer, various possible tracks & double degrees

- **In close contact with the industry**
  Minimum 36 weeks of internships, 200+ partnerships with industry leaders

- **Deeply International**
  25% international students. 6-month mandatory period abroad.
A new curriculum design

**Acquiring solid foundations**
- #Starting Block
- #Start & Go (multidisciplinary team work)
- Common Core Courses
- Internship (4 weeks)

**Broadening knowledge & skills & Combining several disciplines**
- Discipline Elective Courses (Semester 2, Y1 & Y2)
- Integration Electives (Year 2 Semester 1)

Exhaustive course offer: more than 85 possible choices
A new curriculum design

Year 1
Semester 1

Year 1
Semester 2

Year 2
Semester 1

Year 2
Semester 2

Year 3
Semester 1

Year 3
Semester 2

Exploration of a professional function & Expert Courses

- Professional Pathways
- 4 Themes & Tracks:
  - Industry of the Future
  - Sustainable Construction and Energy
  - Smart Systems & Environments
  - From Data Strategy to Data Control

Transitionning to a professional capacity (End-of-Course Internship)

- Full semester
- In a company or a university lab
- End-of-course Thesis
### Tailor your study programme: Discipline Electives

<table>
<thead>
<tr>
<th><strong>ELECTRICAL ENGINEERING, ELECTRONICS, AUTOMATICS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Architecture of embedded systems for control and supervision</td>
</tr>
<tr>
<td>- Design and control of a robotized production line</td>
</tr>
<tr>
<td>- Electric and renewable energy</td>
</tr>
<tr>
<td>- Electricity for sustainable housing</td>
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<tr>
<td>- System modeling and control: application to robotics</td>
</tr>
<tr>
<td>- Electric mobility</td>
</tr>
<tr>
<td>- Electronic systems for sensors</td>
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<tr>
<td>- Electronic systems for telecoms</td>
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<td>- ...</td>
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<tr>
<th><strong>MATHEMATICS - COMPUTER SCIENCE</strong></th>
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<tbody>
<tr>
<td>- Random modeling and scientific calculation</td>
</tr>
<tr>
<td>- Object oriented programming</td>
</tr>
<tr>
<td>- Information systems</td>
</tr>
<tr>
<td>- System and network</td>
</tr>
<tr>
<td>- Web 2.0 technologies</td>
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<tr>
<th><strong>MECHANISMS AND STRUCTURES</strong></th>
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<tr>
<td>- CAD of mechanical systems</td>
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<tr>
<td>- Characterization and modelling of material behavior</td>
</tr>
<tr>
<td>- Calculation of civil engineering structures</td>
</tr>
<tr>
<td>- Structural dynamics and vibrations</td>
</tr>
<tr>
<td>- Continuous media mechanics and numerical simulation</td>
</tr>
<tr>
<td>- Mechanics at the service of living organisms</td>
</tr>
<tr>
<td>- Rapid prototyping and additive manufacturing</td>
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<tr>
<td>- Product specification and manufacturing</td>
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<td>- ...</td>
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<th><strong>ENTERPRISE AND SOCIETY</strong></th>
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<tr>
<td>- Self-knowledge (3 variants)</td>
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<td>- ...</td>
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<th><strong>SCIENCE OF MATTER</strong></th>
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<tr>
<td>- Biorefinery</td>
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<td>- Solid state physics</td>
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<tr>
<td>- Materials Science</td>
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<tr>
<td>- Heat and material transfers</td>
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<tr>
<td>- Transport for fluids</td>
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<td>- ...</td>
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</tbody>
</table>

**Full list of classes:** [http://syllabus.centralelille.fr](http://syllabus.centralelille.fr)
Tailor your study programme: *Integration Electives*

*Combining several disciplines from different departments*

Integration Elective 1 ➔ Integration Elective 1 ➔ Integration Elective 2 ➔ Integration Elective 2

**Integration Electives 1 (1 out of 9)**
- Sports & Science
- Biomedical Engineering
- Imaging & Instrumentation Sciences & Technology
- Autonomous Transport Systems
- The Sound of Science
- Modelling for Organisational Management
- Creation of High-Tech Start-ups
- Artificial Intelligence & Health
- Architectural Design and Sustainable Dev.

**Integration Electives 2 (1 out of 10)**
- Learning by Sinking / Shipwreck Training
- Biomimetic Flow Control
- DEcLICK: 2 Liters per 100km
- Eco-Design for Positive Energy Habitat
- Reverse Engineering and Redesign
- Construction 4.0
- Approaches to Energy & Power Transmission
- Energy Transition and Power Grid
- Preliminary Design of a Railway Line
- Bioeconomy

**Challenges**
(group work, 1 week each + debrief)
- Imagine & Make
- Business Game
- Leadership in Extreme Situation

**Other Courses and Activities**
- Long-term Group Project
- Modern Foreign Languages
- Personal Challenge
Mixing the exploration of a professional function with theme-based expert courses

Industry of the Future

- Industry 4.0
- Sustainable Design and Construction

Design sustainable, eco-friendly and agile products and production systems

Smart Systems & Environments

- Interactive Systems and Advanced Communications
- Embedded Systems and Cyber-physics

Take up the challenge « Smart: Everything and Everywhere »
Year 3 Semester 1: Themes & Tracks

Mixing the exploration of a professional function with theme-based expert courses

Themes & Tracks

Themes & Tracks

Themes & Tracks

Sustainable Construction and Energy

A Smart City connected to Climate Change

• Sustainable Construction and Materials
• Energy and Smart Grids

From Data Strategy to Data Control

Organise, understand and model exponential data to improve decision making

• Data Science and Artificial Intelligence
• Enterprise Architecture and Modelling
Year 3 Semester 1: *Professional Pathways*

*Mixing the exploration of a professional function with theme-based expert courses*

- **Researcher**
- **Production & Operations manager**
- ** Consultant – Auditor**
- **Innovation & Development Manager**
- **Entrepreneur**
- **International Project Manager**
Multi-Year Components

Foreign Languages

Long-term Project

Personal challenge

Internships (36 weeks)
ENSCL Curriculum:
Chemical Engineers for a sustainable future
ENSCL Curriculum

- **CAPSTONE INTERNSHIP** - 6 months
- **F.G.-L EXCHANGE PROGRAMME**
- **SEMESTER ABROAD**
- **WORK-STUDY CONTRACT**
- **DOUBLE DEGREE**

Optional master’s degree in chemistry

**EXTENSION OF MAJOR STUDIES**

**SELECTION OF MAJOR**
Formulation Chemistry, Sustainable Chemistry and Processes for Industry, or Optimization and Reliability of Materials.

**APPLICATIONS OF CHEMISTRY**
Industrial Chemistry

**INTERNSHIP** - 2 to 3 months

**INTERNSHIP** - 6 weeks

**FUNDAMENTAL CHEMISTRY**
ENSCL Curriculum: Year 1

**Year 1**
- Semester 1
- Semester 2

**Year 2**
- Semester 1
- Semester 2

**Year 3**
- Semester 1
- Semester 2

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**Fundamental Chemistry**
- Analytical Chemistry
- Organic Chemistry & Spectroscopy
- Organic & Macromolecular Chemistry
- Physical Chemistry
- Chemical Engineering
- Mineral Chemistry
- Professional Skills & Humanities
  - Project Management
  - Applied Statistics & Data Processing
  - Corporate Finance and Accounting
Application of Chemistry

Industrial Chemistry

- Organic Chemistry
- Formulation
- Materials Science
- Industrial & Sustainable Chemistry
- Professional Skills & Humanities
  - Tools & Methods for Problem-Solving
  - Patents
  - Numerical Modelling
  - Bibliographic Research
  - Oral & Written Communication
One major to choose between:

- Formulation Chemistry
- Optimisation and Reliability of Materials
- Sustainable Chemistry and Processes for the Industry

**Final Year Project Capstone Internship**
- Industry
- University Lab
- 24 weeks minimum

**MAJEURE :**
- Chimie de formulation
- Optimisation et fiabilité des matériaux
- Chimie & Procédés durables pour l'industrie
Multi-Year Components

- **Year 1 Semester 1**
- **Year 1 Semester 2**
- **Year 2 Semester 1**
- **Year 2 Semester 2**
- **Year 3 Semester 1**
- **Year 3 Semester 2**

- **Foreign Languages**
- **Sustainable Development Classes**
- **Humanities & Management**
- **Internships (38 weeks)**
Master’s & PhD Degrees
Develop your expertise at Centrale Lille
Master’s Degrees Offer

French-Taught Master’s Degrees

- Communicating systems
- Management of artificial intelligence in the field of Health
- Mechanics: R&D in Materials Mechanics
- Geomaterials and structures in civil engineering
- Sustainable Industrial Processes (catalysis and processes)
- Chemistry and Formulation Engineering
- Engineering of Polymers and Materials for the Environment

International Master’s Degrees

- Biomedical Engineering (BME)
- Robotics & Transports (MRT)
- Aeronautics & Space — Turbulence

Other English-Taught Master’s Degrees

- Electrical Energy for Sustainable Development
- Biorefinery
- Data science
- Nanosciences and nanotechnologies
- Advanced Solid Mechanics (Erasmus Mundus)
- Integrated Res. for Advanced Chem. & Materials
Graduate School of Engineering and Systems Science

- Mechanical Engineering & Civil Engineering
- Electrical Engineering
- Micro & Nanotechnologies, Acoustic & Telecommunications

Graduate School of Mathematics and Digital Sciences

- Automatic Control & Signal Processing
- Computer Science

Graduate School of Matter, Radiation, and Environmental Sciences

- Molecules & Condensed Matter
International Students: What’s in it for you?
Centrale Lille’s International Partnerships

180 Academic Partnerships
70 Double Diplomas
46 Countries
Incoming Students / Degree or Non Degree Mobility

For students at partners universities only (no free movers)

- **Double Degree (French)**
  Part of the master’s degree at home institution
  + 2 years at Centrale Lille (Y1+Y2 or Y2+Y3) = 2 Degrees

- **Exchange Semester Mobility (French or English)**
  Earn academic credits recognised at your home university

- **Short-term Research Internships**

- **Semester-long Research Internships**
International Students:
English-taught Exchange Programmes
- Mix of Elective Courses (6 to choose) + French Language Classes & a semester-long Research Project in one of our labs

- Course Offer includes:
  - Object-oriented Programming, Biorefinery, Design and Control of an automated production line, Solid-State Physics, Signal Representation and reverse issues, Smart Decision, Wave Imaging, Optimisation and Prescriptive Analysis, Structural Calculus in Civil Engineering,
  - Aerodynamics, Electronic Systems for Sensors, Smart Systems, Physical Principles of Sensing and Actuating (Multiphysics), Smart City Geotechnics et Tunnels, Advanced Physics, Real time estimation for Engineers, Dynamics of Mechanical Systems

- February to July

- 30 ECTS

- [https://ecole.centralelille.fr/semesterinenglish/](https://ecole.centralelille.fr/semesterinenglish/)
Follow one of ENSCL’s Final Year following Majors:
- Formulation Chemistry
- Optimisation & Reliability of Materials

One semester-long Research Project in one of our labs

French Language Classes

Course on French Culture & Society in a Professional Capacity

September to end of January

30 ECTS
International Students: Application process & deadlines
Nomination and Application processes:

- Candidates must apply at their home institution first according to its internal timeline
- Centrale Lille organises face-to-face recruitment for Double Degrees with some partners
- Once nominated, students send their application to Centrale Lille (directly or through International Relations Coordinator)
- An admission letter will be sent to selected students

Language requirements

- French-taught Programmes = B1 for non-degree mobility, B2 for degree-seeking students
- English-taught Programmes = IELTS 6.5 equiv. (B2)
## Application Timeline

<table>
<thead>
<tr>
<th></th>
<th>École Centrale de Lille</th>
<th>ENSCL</th>
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<tbody>
<tr>
<td><strong>For the Autumn Semester (Exchange &amp; Double Degree)</strong></td>
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<tr>
<td>Nomination Deadline</td>
<td>1st of April</td>
<td>1st of April</td>
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<tr>
<td>Application Deadline</td>
<td>15th of April</td>
<td>15th of April</td>
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<td>Confirmation to students</td>
<td>End of May</td>
<td>End of May</td>
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<tr>
<td><strong>For the Spring Semester (Exchange)</strong></td>
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<td>Nomination Deadline</td>
<td>15th of October</td>
<td>15th of October</td>
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<tr>
<td>Application Deadline</td>
<td>31st of October</td>
<td>31st of October</td>
</tr>
<tr>
<td>Confirmation to students</td>
<td>End of November</td>
<td>End of November</td>
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</table>
International Students: Welcoming and Onboarding
Start your mobility on the right foot!

Full support by the Office for International Relations for

- Visa Application
- Grants & Bursaries (Eiffel)
- Pre-Arrival Info Session
- School Residence Housing Solutions
- Pre-sessional French Language Learning
Start your mobility on the right foot!

Before departure

Upon arrival

During mobility

Arrival & Welcome Arrangements

- Buddy system
- Pick-up at train station
- Help you move in
- Meet-and-Greet Week
  - Student-lead activities
  - On-boarding academic activities
  - Arrival Formalities
Start your mobility on the right foot!

Before departure  |  Upon arrival  |  During mobility

All along your time with us

- Dedicated International Students Club
- Administrative support from the Office for International Relations
- Mandatory French Language classes
- Regular Events organised by students
- ...

centralelille
Meet-and-Greet Week - International Students - New AY / September 2021

**Saturday, 28-08**
- **8h - 9h**: International Students Arrival*
- **9h - 10h**: Welcoming & Orientation + Visit*
  - International Office + Student Organizations + Country Coordinators
    - Amphi Cuccaroni
- **10h - 11h**: Lunch
- **11h - 12h**: Health Insurance Info Session
  - Amphi Boda
- **12h - 13h**: Shopping center
- **13h - 14h**: SIM card
- **14h - 15h**: Maths
  - Amphi Boda
- **15h - 16h**: French Lang. Group A
  - E-405
- **16h - 17h**: French Lang. Group B
  - E-405
- **17h - 18h**: Welcome Drink
  - Imagine
- **18h - 19h**: Rezoleo
- **19h - 20h**: Sharing

**Sunday, 29-08**
- **8h - 9h**: Bank
- **9h - 10h**: Picnic in Lille
  - Visit

**Monday, 30-08**
- **8h - 9h**: Bank
- **9h - 10h**: French Lan. Group B
  - E-405
- **10h - 11h**: French Lan. Group A
  - E-405
- **11h - 12h**: French Lan. Group A + B
  - E-502
- **12h - 13h**: Ecole Centrale New students Welcome
  - Visit
- **13h - 14h**: Maths
  - Amphi Boda
- **14h - 15h**: Bank
- **15h - 16h**: French Lan. Group B
  - E-405
- **16h - 17h**: French Lan. Group A
  - E-405
- **17h - 18h**: Volleyball
- **18h - 19h**: Colocathon
- **19h - 20h**: Flam’s restaurant

*École Centrale de Lille & ENSCL Students
September 2022 Cohort of International Students
Videos on Lille & Centrale Lille:

https://youtu.be/UE03imksKY4
https://youtu.be/N6DdU5jesWY
Q&A Session

pole.ria@centralelille.fr
https://centralelille.fr