**Contact**
Bruno François: bruno.francois@centralelille.fr

**Language & Duration**
M2 courses 100% in English - 1 year

**Registration Fee**
243€ in 2021-2022 (or 159€ for second inscription, as students engineer)

**Selection**
Complete application file to be submitted to the establishment

**Intended Audience**
French or international student with an M1 or M2 level

**Prerequisites**
- Good level in initial master and in English
- Good level in applied physics for electrical engineering (electricity, electronics, automation...)

**OBJECTIVES**
The proposed units aim to train future engineers/researchers on electrical systems for sustainable development to become an actor in the energy transition by:
- Innovating in the field of eco-responsible electrical systems
- Integrating renewable energy production and improving its performance
- Improving the energy efficiency of traditional electrical systems

The topics covered are power conversion, design of high performances electromechanical actuators, electric mobility, integration of renewable energy sources into the grid.

The aim of the course is to prepare students for a PhD in Electrical Engineering, which will enable them to acquire the necessary expertise to access R&D positions in the renewable energy sector and its applications.
JOB OPPORTUNITIES

The opportunities concern all application sectors of Electrical Energy for the energy transition:

- R&D in public and private research laboratories
- R&D in companies of the electric energy sector and the energy transition
- R&D in the automotive, railway and avionics sectors
- ....

PROGRAM

According to the French nomenclature, the training is organized around Blocks of Knowledge and Skills (BKS):

<table>
<thead>
<tr>
<th>Master 2 Semester 3</th>
<th>Language and Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>BKS3 - Personal development</td>
<td>Bibliographic research Project</td>
</tr>
<tr>
<td>BKS4 - Implantation of methods and tools in the EE disciplinary field</td>
<td>Energy Conversion Electromagnetic conversion and eco design</td>
</tr>
<tr>
<td>BKS11 – Master methods and tools for innovation in electrical engineering</td>
<td>Sustainable Development Applications Advanced module</td>
</tr>
<tr>
<td>BKS12 – Master the transition from methods to innovative applications</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Master 2 Semester 4</th>
<th>Scientific project</th>
</tr>
</thead>
<tbody>
<tr>
<td>BKS4 - Implantation of methods and tools in the EE disciplinary field</td>
<td>Research Internship</td>
</tr>
</tbody>
</table>

The M2 courses are mainly given by the L2EP research professors.

Program content:

- Language and Communication (50h): Speaking practice (with group level) in French language for English spoken students or in English language for others.
- Energy Conversion (50h):
  - Design of advanced power electronic systems
  - Analyze complex energy conversion system for control purpose
- Electromagnetic conversion and eco design (50h)
- Advanced Module (50h): « Electrical systems and renewable production » or « Electrical systems for future transportation »
- Bibliographic research Project (50h): Perform bibliographic research on various topics and write a scientific literature review
- Sustainable Development Applications (50h): Write a synthetic report in English on a seminar and present a poster on a scientific topic
- Scientific project (100h)
- Research Internship: 4 to 6 months internship in a laboratory or company (In France the minimum legal remuneration is around 550 euros/month for internship)