

DOMAINE SCIENCES, TECHNOLOGIES, SANTE PROGRAMME PEDAGOGIQUE MASTER 2

MASTER AUTOMATIC CONTROL AND ELECTRICAL SYSTEMS

“Electrical Energy for Sustainable Development” Path - (E2SD)



The E2SD Master's degree is co-accredited by Centrale Lille, University of Lille and Arts et Métiers Lille Center.

Contact

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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
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PROGRAM

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

Master 2 Semester 3

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

Master 2 Semester 4

BKS4 - <i>Implantation of methods and tools in the EE disciplinary field</i>	Scientific project Research Internship
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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)