Université de Lille

Énergie électrique et développement durable / Electrical engineering for sustainable development (M2)

Master Automatique et systèmes électriques

Durée
1 an

Composante
Faculté des sciences et technologies

Langue(s) d'enseignement
Anglais

Présentation

The **Master E2SD** is a degree co-authorized by the University of Lille, Arts et Métiers ParisTech Lille Center, and Centrale Lille. Additionally, the program offers double-degree opportunities with the Harbin Institute of Technology (HIT, China) and Ghent University (Belgium) .

This master's program provides specialized knowledge in electrical engineering applied to environmental challenges. It serves as an effective preparation for PhD studies in areas such as:

- Power conversion,
- Design of high-performance electromechanical actuators,
- Sustainable transportation,
- Integration of renewable energy sources into the grid.

Objective of the Master "Electrical Engineering for Sustainable Development" (E2SD) : To train students in advanced methods for designing and controlling electrical systems, aiming to:

- Increase the contribution of renewable energies in electricity generation and transportation,
- Improve the performance and energy efficiency of electrical systems,
- Promote a more rational use of natural resources,
- Foster greater respect for environmental heritage.

Savoir-faire et compétences

At the end of the training, students are able to address scientific problems in electrical engineering with a sustainable development focus. They can implement appropriate tools to provide solutions, including:

- Definition of advanced power electronic systems for sustainable applications and analysis of complex energy conversion systems for control purposes,
- Application of energy modeling skills and their use in eco-design concepts,
- Analysis of low-frequency electromechanical conversion and implementation of methods for optimal design,
- Study of new energy storage systems for future transportation,
- Development of future traction systems using systemic optimization and multiphysical modeling,
- Exploration of solutions for integrating renewable energies into the electricity system and designing subsystems for renewable energy systems.

Les + de la formation

The strengths of the **M2 E2SD** program include:

- International character: The program attracts students from diverse nationalities, fostering cultural exchange and exposure to different perspectives and approaches.
- Cutting-edge curriculum: Courses are taught by active teacher-researchers, ensuring that students receive up-to-date knowledge based on the latest research.
- Research environment: Students benefit from being part of a recognized research laboratory with a strong network of national and international industrial and academic partners.
- Strong career prospects: The program boasts high rates of professional integration and doctoral pursuit, indicating its strong reputation in both industry and research sectors. This recognition highlights the program's ability to produce well-qualified candidates for careers in research and industry.

Organisation

Organisation

Within the **Master "Electrical Engineering for Sustainable Development" (E2SD)**, professional training (internship) is a key component and takes place during the last semester for a minimum of 4 months.
The master's student works under the supervision of a scientist on an innovative topic. At the end of the training period, the student presents their results through a written report and an oral defense.
Professional training can be conducted either in a research lab or in an industrial context, with the following objectives:

- Application of concepts studied in the previous semester,
- Developing autonomy to work on a new scientific project,
- Enhancing initiative capabilities and applying research methodology,
- Conducting a state-of-the-art review and synthesizing scientific results for oral and written presentations.

The program units include both fundamental and practical courses, organized around fields of skills, know-how, and knowledge (referred to as BCC):

BCC – Mastering concepts and tools for designing energy conversion systems
BCC – Building your personal and professional project
BCC – Applying methods and tools in automation and electrical systems
BCC – Mastering concepts and tools for controlling and supervising automated systems
BCC - Mastering in-depth modelling of complex systems
BCC - Innovating in electrical engineering with tailored methods and tools
BCC - Transferring methods to real-world applications

Stages

Stage : Obligatoire

Stage obligatoire au S4

Admission

Conditions d'admission

For European students an no EEF students: Application: Submit your application by following this link: https://www.univ-lille.fr/formation/candidater-sinscrire/ecandidat

For EEF students: Etudes en France : https://www.campusfrance.org/fr/candidature-procedure-etudes-en-france

Et après

Poursuite d'études

The doctoral pursuit rate is about 35% (average value since 2008) and increases to more than 50% for students in single registration (who follow only the master degree). Other students find work in industry in France or in their home country.

Insertion professionnelle

Since this **M2 is taught entirely in English**, over **40% of the enrolled students are international**, coming from diverse countries such as China, Vietnam, Morocco, Russia, Iran, Argentina, Spain, Algeria, and more. This international representation continues to grow, thanks to increased promotion of the program on specialized platforms.
After completing a **PhD**, graduates pursue careers in **research and higher education**, both in public and private sectors, including:

- **Associate Professor** (Universities, Engineering Schools),
- **Researcher** in public laboratories (CNRS, IFSTTAR, etc.) or industrial laboratories (EDF, etc.) ,
- **Project Manager/Engineer** in multinational corporations, SMEs/SMIs (Siemens, Alstom, Valeo, etc.) , and public institutions (Regional authorities, etc.) .

For more information on the professional integration of graduates, visit the **ODiF (Observatoire de la Direction de la Formation)** studies and surveys: https://odif.univ-lille.fr/repertoires-demplois/

Les fiches emploi/métier du Répertoire Opérationnel des Métiers et des Emplois (ROME) permettent de mieux connaître les métiers et les compétences qui y sont associées.

Infos pratiques

Autres contacts

Contact administratif et pédagogique :
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Lieu(x)

Villeneuve d'Ascq

Campus

Campus Cité scientifique

En savoir plus

Faculté des Sciences et Technologies
https://sciences-technologies.univ-lille.fr/