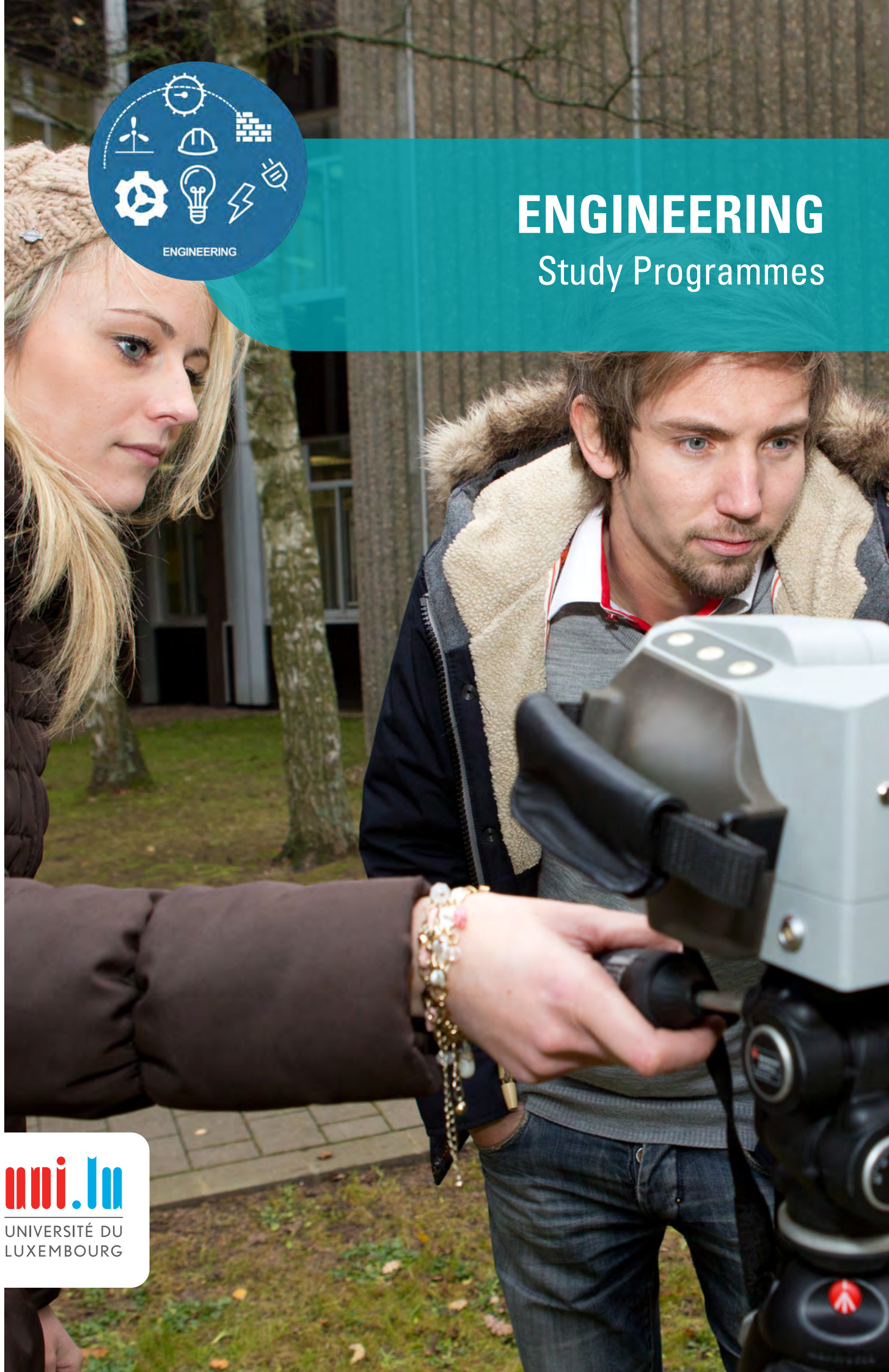




# ENGINEERING

## Study Programmes







“Science is a way of life.  
Science is a perspective.  
Science is the process that  
takes us from confusion to  
understanding...”

Brian  
Greene



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The Faculty of Science, Technology and Medicine (FSTM) **at a glance**

**1**   
faculty

**5**   
departments

**3**   
campus sites


**2000**   
students

from   
**100**  
different  
countries

**60%**   
international  
students

more than **500**   
staff members

**31**   
study programmes

**1**   
doctoral school

more than **500**   
doctoral candidates

**3** official  
languages  
  



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# Engineering?



## Building the future together

Civil engineering, mechanical engineering, electrical engineering, energy and digital engineering play a prominent role in the Luxembourg economy. Engineers are highly sought by the market. Especially in Luxembourg, economy is continuously growing, generating staffing needs in all sectors. Also structural changes like the energy transition, digitalisation, Industry 4.0 require well educated engineers with a good theoretical knowledge and practical application skills. We aim to educate graduates with this background ready for careers in the industry, the construction sector, engineering offices, public administration and research institutions.

In particular, with some 3,700 companies employing 43,000 persons, the building sector is the one with the largest number of companies that employs the most people<sup>1</sup>. It is a firmly established sector, well adapted to local conditions and the Greater Region, which has seen significant growth each year and has achieved a high level of competitiveness. Civil engineering, both as structural engineering as well as infrastructure planning is a key element of the building sector. But also mechanical, electrical and digital engineering is required in that sector, as well as in the development of renewable energy sources and environmental protection technologies<sup>2</sup>.

**Frank Scholzen**  
Study Director

**“What is an engineer ? Bridges, cars, smartphones, solar energy systems... would not be available without engineers. A wide field of applications and a huge range of exciting opportunities characterise the work and the national and international job market of engineers.”**

Luxembourg is a country that embraces innovation, evidenced by the range of construction-related clusters and initiatives that are in place. The University of Luxembourg is deeply involved in this development and a leading research institution. The outlook for Luxembourg's construction sector is positive. The sector is expected to benefit from strong demand for residential construction and office buildings, and growth in public spending<sup>3</sup>.

<sup>1</sup> Source: Brochure « Les qualifications de demain dans l'industrie », Fedil, 2019

<sup>2</sup> Source: Brochure « Chiffres clés de l'artisanat », Chambre des Métiers, 2017

<sup>3</sup> Source: European Construction Sector Observatory, Country profile Luxembourg, June 2018

## Crucial need of engineers: get a Bachelor or more!

Recruitment in the industrial and in the construction sector is a real challenge as there is a need not only to replace natural departures but also to hire qualified people in up-to-date technologies. Thus, there is an increased demand for skilled engineers in Luxembourg. For the period 2018-2020, 1397 new hires are planned and Bachelor and Master/doctorate degrees are mainly sought in the fields of management and technique<sup>1</sup>. Also, in the Greater Region and the European neighbour countries, the employability of young engineers and the perspectives for young graduated engineers are excellent.

<sup>1</sup> Source: Brochure « Les qualifications de demain dans l'industrie », Fedil, 2019



## Excellent engineering training: join our university!

By joining us, you will benefit from many advantages:

### COMPLETE TRAINING OFFER

We offer multilingual Bachelor, Master and doctoral training programmes in engineering with applied or research orientation.

### EFFICIENT METHODOLOGY

Our courses provide you with a thorough understanding of the fundamentals and their application, emphasising rigour and practical relevance. Multidisciplinary approach is privileged promoting knowledge sharing and exchange of experiences. In addition, project work is central: you will work in teams.

### EXCELLENT ENVIRONMENT

You will join small classes, benefit from individual supervision and work with state-of-the-art equipment. You will have the chance to learn from internationally renowned professors and experts from the field. You will enjoy a multicultural environment as both students and faculty members come from many different countries.

### CLOSE COLLABORATION WITH RESEARCH

Early involved in research project, you will work with staff involved in the latest research, gaining in-depth knowledge from experts working at the forefront of the subject. The Department of Engineering (DoE) is an interdisciplinary group active in the classical domains of civil, electrical and mechanical engineering and geophysics.

### STRONG LINKS WITH INDUSTRY

We work closely with the industry, enabling you to acquire knowledge and experience from leading companies, including working with industrial mentors and the opportunity to spend time with them on internships.

Thus, Luxembourg offers unique opportunities to study and work in the field of engineering.

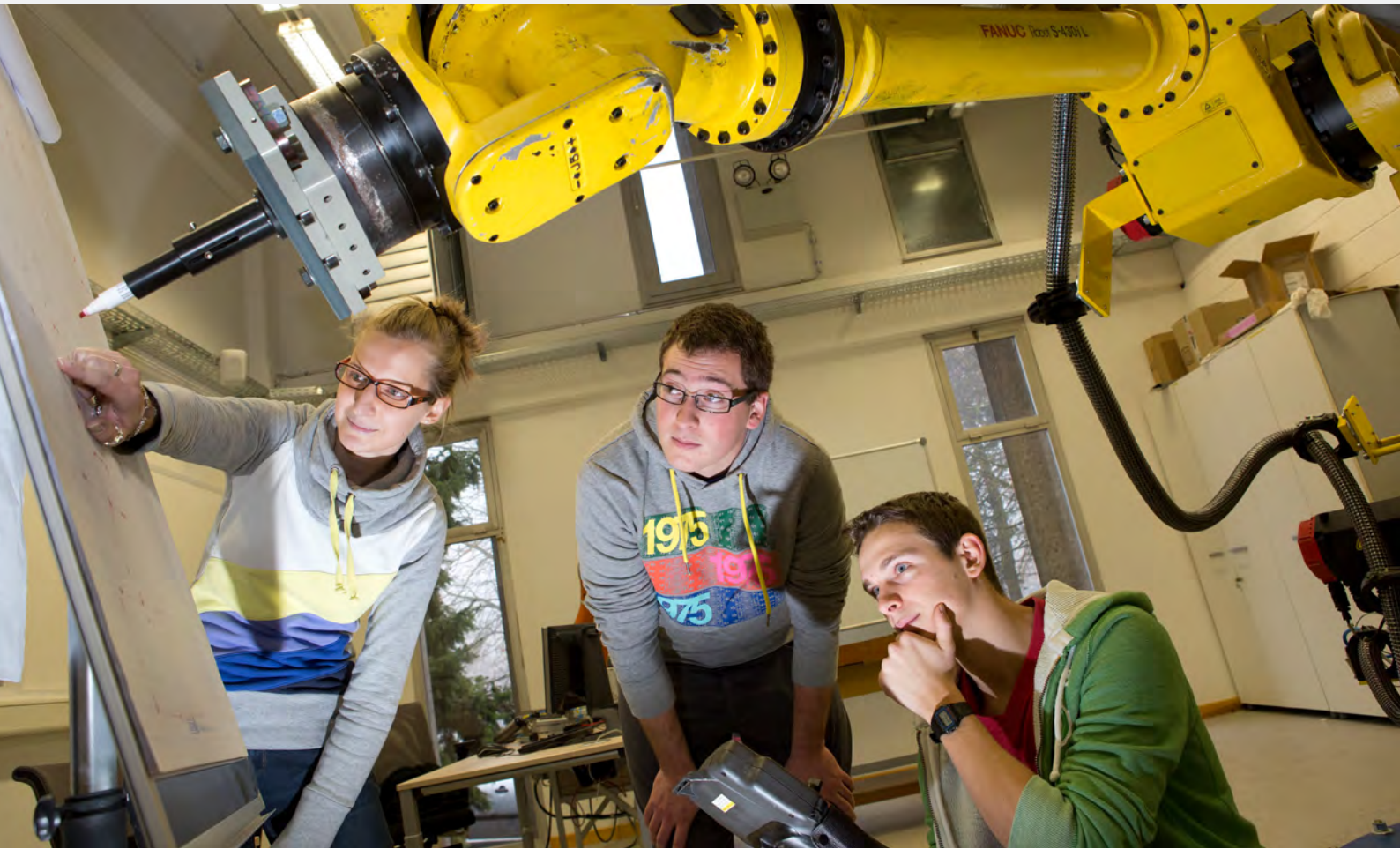


Overview

BACHELOR (3 years)



Bachelor im  
Ingenieurwesen



MASTERS (2 years)



Master of Science in Civil Engineering  
- Megastructure Engineering with  
Sustainable Resources



Master of Science  
in Engineering - Sustainable  
Product Creation



Master en Sciences de l'Ingénieur -  
Efficacité Énergétique  
et Économique



Master en Développement  
Durable

DOCTORAL EDUCATION



Doctoral Programme  
in Civil Engineering



Doctoral Programme  
in Mechanical/Electro and  
Communications Engineering



Doctoral Programme  
in Computational Sciences





# Bachelor im Ingenieurwesen

Der Bachelor im Ingenieurwesen gibt den Absolventen sowohl ein solides Grundlagenwissen als auch praxisnahe Vertiefungen in den jeweiligen Studienrichtungen Elektrotechnik, Energie und Umwelt, Bauingenieurwesen, Maschinenbau sowie Digitales Ingenieurwesen. Das Programm vermittelt daher die notwendigen Fähigkeiten, um entweder mit dem Bachelordiplom schnell in den Arbeitsmarkt einzusteigen oder das Studium mit einem Master an der Universität Luxemburg oder anderswo fortzusetzen.

## STÄRKEN

- Auswahl unter 6 Studienrichtungen
- Berufsqualifizierender Bachelor
- Für anschließende Masterstudiengänge geeignet

## ZULASSUNGSVORAUSSETZUNGEN

- Diplôme d'études secondaires ou secondaires techniques au Luxembourg ou diplôme étranger reconnu équivalent par le Ministère de l'Education nationale
- Diplôme de technicien (avec modules préparatoires)
- Sprachkenntnisse: Niveau B2 für Deutsch, B1 für Französisch, B1 für Englisch

## PERSPEKTIVEN

- Master in Engineering
- Berufsmöglichkeiten in Ingenieurbüros, in der Industrie, im Bausektor, im Energie- und Umweltbereich, im Elektro- und IT-Bereich, im öffentlichen Dienst,...

## DAS PROGRAMM AUF EINEN BLICK

- **Dauer:** 3 Jahre Vollzeit / 6 Semester (180 ECTS) - 1 Mobilitätssemester im Ausland
- **Sprachen:** Deutsch (70%), Französisch (15%), Englisch (15%)
- **Registrierungsgebühren:**
  - 400€/Semester (1 & 2)
  - 200€/Semester (3 bis 6)
- **Registrierungsfristen:**
  - EU-Studenten: April - Juli
  - Nicht-EU Studenten: Februar - April

## ZUSÄTZLICHE INFORMATIONEN

### KONTAKT

beng@uni.lu

### CAMPUS

Kirchberg

[beng.uni.lu](https://beng.uni.lu)



## Elektrotechnik

Kurse	ECTS
<b>Semester 1</b>	
CAD	5
Informatik	5
Elektrotechnik	5
Mathematik	6
Physique	5
Technische Mechanik	5
<b>Total</b>	<b>31</b>

<b>Semester 2</b>	
Digitaltechnik	3
Elektronik & Photonik	5
Elektrotechnik	4
Informatik	4
Leistungselektronik	3
Mathematik	6
Telekommunikation	2
Mikroprozessor	4
<b>Total</b>	<b>31</b>

<b>Semester 3</b>	
CAO – Schaltungssimulation	3
Elektronik & Photonik	2
Elektrotechnik	3
Mathematik	6
Messtechnik	3
Mikroprozessor	4
Regelungstechnik	5
Technik der Netze	5
<b>Total</b>	<b>31</b>

<b>Semester 4</b>	
Mobilitätssemester	30
<b>Total</b>	<b>30</b>

<b>Semester 5</b>	
Digital design	4
Leistungselektronik	6
Nicht-technisches Wahlfach	4
Signale und Systeme	4
<b>Wahlfächer:</b>	
- Automatisierungstechnik / Gebäudeautomation	5
- Technik der Netze	5
- Electrical energy production, transportation and distribution	3
- Elektrische Maschinen & Antriebstechnik	5
<b>Total</b>	<b>28</b>

<b>Semester 6</b>	
Bachelor thesis	12
Elektrische Energieverteilung Vertiefung	2
Leistungselektronik	4
Prototyp Mikroelektronik	4
Real World Data Acquisition	3
Regelungstechnik	4
<b>Total</b>	<b>29</b>



"Engineers create innovative and sustainable solutions that shape our everyday life. I chose to study this Bachelor because it provides an excellent insight into methods and challenges of the engineering profession. The proximity to real-life applications and a multilingual environment at the University allows for a wide range of national and international job opportunities. There are multiple pathways after finishing your bachelor studies, engaging in a professional career or pursuing a master's degree, all options are available."

**Steffen Bechtel, graduate**



# Energie und Umwelt

# Bauingenieurwesen

Kurse	ECTS
<b>Semester 1</b>	
CAD	5
Elektrotechnik	5
Informatik	5
Mathematik	6
Physique	5
Technische Mechanik	5
Total	31

<b>Semester 2</b>	
Bauphysik	4
Baustoffkunde/Werkstoffkunde	6
Design project based learning	3
Mathematik	6
Technische Mechanik	5
Thermodynamik	5
Total	29

<b>Semester 3</b>	
Erneuerbare Energien	3
Fluid mechanics	4
Gebäudetechnik	5
Mathematik	6
Thermal Lab	3
Thermodynamik	5
Wahlfach Bereich Infrastrukturen	4
Total	30

<b>Semester 4</b>	
Mobilitätssemester	30
Total	30

<b>Semester 5</b>	
Finite Elemente Methode für thermische Anwendungen	5
Législation	3
Nicht-technisches Wahlfach	3
Regelungstechnik	5
<b>Spezialisierung - Building &amp; Environment</b>	
Automatisierungstechnik	5
Wahlfächer	7
Workshop Gebäudeenergie	3

<b>Spezialisierung - Sustainable Energy Technology</b>	
Electrical Energy Production, Transportation and Distribution	3
Hydromechanische Maschinen	3
Thermal Lab	3
Wärmenetze	2
Wärme- und Stoffübertragung	4
Total	31

<b>Semester 6</b>	
Bachelor thesis	12
Brennstoffe / Biomasse / Luftreinhaltung	4
Kraftwerkstechnik – Energiesysteme – Power to Gas	4
<b>Spezialisierung - Building &amp; Environment</b>	
Abfallwirtschaft & Altlasten	4
Gebäudetechnik	5
<b>Spezialisierung - Sustainable Energy Technology</b>	
Chemische Thermodynamik und Reaktionskinetik	5
Energiespeicher	2
Kältetechnik	2
Total	29

Kurse	ECTS
<b>Semester 1</b>	
Baukonstruktionlehre	5
CAD	5
Informatik	5
Mathematik	6
Naturwissenschaftliche Grundlagen	5
Technische Mechanik	5
Total	31

<b>Semester 2</b>	
Bauphysik	4
Baustoffkunde/Werkstoffkunde	6
Design project based learning	3
Mathematik	6
Technische Mechanik	5
Vermessungskunde	5
Total	29

<b>Semester 3</b>	
Législation	3
Massivbau	3
Mathematik	6
Raumplanung & Verkehrsplanung	4
Stahlbau	3
Structural analysis	5
Technische Mechanik	5
Wasserinfrastruktur	2
Total	31

<b>Semester 4</b>	
Mobilitätssemester	30
Total	30

<b>Semester 5</b>	
Hydromechanik und Bodenmechanik	5
<b>Spezialisierung - Konstruktives Bauingenieurwesen</b>	
Advanced Structural Analysis	5
Massivbau	5
Stahlbau	5
Tragwerkslehre & Computer Aided Engineering	5
Wahlfach Infrastrukturwesen	5
<b>Spezialisierung - Infrastrukturwesen</b>	
Siedlungswasserwirtschaft	5
Städtebau und Landesplanung	5
Trafic Infrastructural Design	5
Wahlfach Konstruktives Bauingenieurwesen	5
Wasserbau & Wasserwirtschaft	5
Total	30

<b>Semester 6</b>	
Bachelor thesis	12
Baubetrieb / Industrie 4.0 in der Bauindustrie	4
Building Information Modelling	5
Grundbau / Baugruben	5
<b>Wahlfächer:</b>	
- Bauwirtschaft / Kalkulation	4
- Einführung Ingenieurholzbau	2
- Eisenbahnbau	2
- Geographical Information Systems	2
- GNSS and its Applications	2
- Project Management	2
- Umwelttechnik	2
- Verkehrsbau	2
Total	29





# Europäisches Baumanagement\*

\*Dieser Studiengang wird gemeinsam mit den Partnerhochschulen Université de Lorraine und der HTW Saar angeboten. Für die Einschreibung informieren Sie sich bitte beim DFHI /ISFATES <https://www.dfhi-isfates.eu/de/studieninteressierte/bachelor-studiengaenge>

Kurse	ECTS
<b>Semester 1 - Université de Lorraine, Metz</b>	
Fremdsprachen	4
Interkulturelles Management	2
Englisch	3
Mathematik	6
Statik	4
Festigkeitslehre	2
Baustoffkunde	3
Baubetrieb	2
Topographie	2
Baukonstruktionslehre	2
Total	30

<b>Semester 2 - Université de Lorraine, Metz</b>	
Fremdsprachen	4
Interkulturelles Management	2
Englisch	3
Mathematik	6
Festigkeitslehre	3
Stahlbetonbau	3
Stahlbau	3
Grundbau	3
Technisches Zeichnen CAD und BIM	3
Total	30

<b>Semester 3 - Université du Luxembourg</b>	
Technische Mechanik	5
Wasserinfrastruktur	2
Raumplanung & Verkehrsplanung	4
Massivbau (Wahlfach)	3
Stahlbau (Wahlfach)	3
Baukonstruktionslehre	5
Baubetrieb	3
Gebäudetechnik	5
Législation	3
Total	30

<b>Semester 4 - Université du Luxembourg</b>	
Technische Mechanik	5
Baustoffkunde / Werkstoffkunde/ (inkl. Lab)	6
Bauphysik	4
Mauerwerksbau (Wahlfach) 1)	2
Einführung Ingenieurholzbau (Wahlfach) 1)	2
Baubetrieb II	4
Bau-Betrieb	4
Gebäudetechnik	5
Total	32

<b>Semester 5 - HTW Saarbrücken</b>	
Praktische Studienphase	22
Projekt	8
Total	30

<b>Semester 6 - HTW Saar, Saarbrücken</b>	
Fremdsprachen 6	4
Interkulturelles Management 6	2
Englisch 6	2
Seminar Bauwesen	2
Wahlpflichtmodule	8
Projektmanagement	4
Baubetrieb IV	4
Deutsches Zivilrecht	2
Schalungstechnik	2
Total	30

<b>Semester 7 - HTW Saar, Saarbrücken</b>	
Fremdsprachen	4
Interkulturelles Management	2
Englisch	2
Arbeitsschutz und Sicherheitstechnik	2
Bauvertragsrecht	2
Facility Management	2
Öffentliches Baurecht	2
Öffentlihckeitsarbeit und Baustelle	2
Bachelorarbeit	12
Total	30

# Maschinenbau

Kurse	ECTS
<b>Semester 1</b>	
CAD	5
Elektrotechnik	5
Informatik	5
Mathematik	6
Naturwissenschaftliche Grundlagen	5
Technische Mechanik	5
Total	31

<b>Semester 2</b>	
Baustoffkunde/Werkstoffkunde	6
Design project based learning	3
Informatik	4
Mathematik	6
Technische Mechanik	5
Thermodynamik	5
Total	29

<b>Semester 3</b>	
Fluid mechanics	4
Machine design	5
Manufacturing technology	5
Mathematik	6
Regelungstechnik	5
Technische Mechanik	5
Total	30

<b>Semester 4</b>	
Mobilitätssemester	30
Total	30

<b>Semester 5</b>	
Elektrische Maschinen / Hydromechanische Maschinen	5
Finite Elemente Methode für mechanische Anwendungen	5
Machine design	10
Propriété intellectuelle	3
Thermodynamik	5
Electives	2
Total	30

<b>Semester 6</b>	
Bachelor thesis	12
Machine design	7
Manufacturing technology	5
Pneumatics	3
Robotik	3
Wahlfach: digital rapid prototyping	(4)
Total	30





# Digitales Ingenieurwesen

Kurse	ECTS
<b>Semester 1</b>	
CAD	5
Elektrotechnik	5
Informatik	5
Mathematik	6
Naturwissenschaftliche Grundlagen	5
Technische Mechanik	5
Total	31

<b>Semester 2</b>	
Digitaltechnik	3
Informatik	4
Mathematik	6
Mikroprozessor	4
Technische Mechanik	5
Thermodynamik	5
Options	3
Total	30

<b>Semester 3</b>	
Gebäudetechnik	5
Messtechnik	3
Machine Design	5
Mathematik	6
Regelungstechnik	5
Technik der Netze	5
Total	29

<b>Semester 4</b>	
Mobilitätssemester	30
Total	30

<b>Semester 5</b>	
Automatisierungstechnik / Gebäudeautomation	5
Big data	4
Cloud computing	4
Data analysis with R	4
Digital design	4
IT lecture	4
Software engineering	4
Total	29

<b>Semester 6</b>	
Bachelor thesis	12
Numerische Mathematik	5
<b>Wahlfächer:</b>	
- Baubetrieb / Industrie 4.0 in der Bauindustrie	3
- Building information modelling	5
- Digital rapid prototyping	4
- Energiespeicher	2
- Geographical information systems	2
- GNSS and its applications	2
- Interaction design	4
- Kraftwerkstechnik – Energiesysteme – Power to Gas	4
- Real world data acquisition	3
- Robotik	3
Total	31







# Master of Science in Civil Engineering Megastructure Engineering with Sustainable Resources

This Master enables students to acquire deeper knowledge in civil engineering with a specific focus on planning and constructing megastructures while using resources sustainably. Sustainability is increasingly important and the well-trained modern civil engineer must be able to judge and optimise civil structures and buildings while taking into account shortages in construction materials and energy resources. This dual focus on megastructures and sustainability sets us apart from other masters of civil engineering.

## STRENGTHS

- Focus on complex projects and sustainability
- Possibility to spend a semester abroad with partner universities in Paris, Nancy, Metz or Brussels
- Collaboration with construction companies and administrations

## ADMISSION REQUIREMENTS

- Bachelor degree in engineering or related field
- Students with other Bachelor degrees and good grades are encouraged to apply
- Language: B2 in English

## CAREER OPPORTUNITIES

- Civil engineer
- Consultant in the construction and public works sector
- PhD in engineering

## PROGRAMME AT A GLANCE

- **Duration:** 2 year full-time programme/ 4 semesters (120 ECTS)
- **Language:** English
- **Registration fees:** 200€/semester
- **Application period:**
  - For EU students: January - August
  - For non-EU students: January - April

## ADDITIONAL INFORMATION

### CONTACT

msce@uni.lu

### CAMPUS

Kirchberg and Belval

[msce.uni.lu](https://msce.uni.lu)



## PROGRAMME

Courses	ECTS
<b>Semester 1</b>	
Concrete structures	5
Finite element analysis of structures	5
Life cycle assessment and eco design	3
Methods in digital building - BIM	4
Project management	3
Steel & composite structures - High rise buildings	5
Thin walled structures	5
<b>Total</b>	<b>30</b>

<b>Semester 2</b>	
Energy efficiency of buildings	4
Engineering surveying	5
Managerial accounting	3
Structural dynamics	4
Sustainable water and resources management	5
Transport systems analysis	4
Transport systems - project	2
Underground structures	3
<b>Total</b>	<b>30</b>

<b>Semester 3</b>	
Advanced design project / Case study	9
Composite structures & fire design	5
Numerical soil mechanics	4
Prestressed concrete structures	5
Scientific writing and presentation skills	3
Steel & composite structures - Bridges	4
<b>Total</b>	<b>30</b>

<b>Semester 4</b>	
Master thesis	30
<b>Total</b>	<b>30</b>



"I highly recommend this Master for the combination of qualified and experienced teachers, personalised follow-up and strong links with local partners. This programme is highly demanding in terms of work and involvement but it will be worth the effort."

**Patrick Pereira Dias, graduate**





# Master of Science in Engineering Sustainable Product Creation



This Master enables students to acquire a comprehensive, deep knowledge of all steps of the product creation process, from market segment specification, product planning, product design and manufacturing to product usage, service and recycling. The courses cover mechanical and electrical aspects. This Master perfectly balances academic education with industrial applicability of cutting-edge content.

## STRENGTHS

- Combination of mechanical engineering and mechatronic issues within sustainable product creation
- Focus on lean and sustainable use of all resources
- Insights into electrical engineering and computer networking to integrate industry 4.0 and IoT skills

## ADMISSION REQUIREMENTS

- Bachelor degree in engineering (mechanical or mechatronics) or related field
- Students with other Bachelor degrees and good grades are encouraged to apply
- Language: B2 in English

## CAREER OPPORTUNITIES

- PhD in engineering
- Engineer, consultant in industry
- Participation in start-up activities and proof-of-concept projects

## PROGRAMME AT A GLANCE

- **Duration:** 2 year full-time programme/ 4 semesters (120 ECTS)
- **Language:** English
- **Registration fees:** 200€/semester
- **Application period:**
  - For EU students: January - August
  - For non-EU students: January - April

## INTERNSHIP

- 10 week-internship during the Bachelor or before the 3<sup>rd</sup> semester of the Master with industrial partners is mandatory

## ADDITIONAL INFORMATION

### CONTACT

mzp@uni.lu

### CAMPUS

Kirchberg and Belval

mzp.uni.lu



## PROGRAMME

Courses	ECTS
<b>Semester 1</b>	
Life cycle assessment and eco design	3
Programming for engineers (Matlab & Python)	4
Project management	4
Sensors and signal processing	3
Supply chain and logistics	4
<b>Electives:</b>	
Assessment of finite element calculations	3
CAD and CAE	4
Communication theory	3
Computational fluid dynamics	3
Computer networking	3
Machine design	4
Production technologies and industrial management	5
Technical energy systems modeling and design	4
<b>Total required</b>	<b>30</b>

<b>Semester 2</b>	
Assembly and testing technologies	4
Managerial accounting	3
Product planning & marketing for engineers	3
Programming for engineers	4
<b>Electives:</b>	
Advanced control	3
Advanced engineering materials	4
Digital factory planning	3
Information theory and coding	5
Machine design exercise	3
Networked feedback systems	4
Quality of service in computer networks	5
Robotics	4
Structural dynamics	4
Thermodynamics	3
<b>Total required</b>	<b>30</b>

<b>Semester 3</b>	
Advanced project / Case study	12
Operational excellence	2
Quality management	3
Robotics	4
Scientific writing and presentation skills	3
<b>Electives:</b>	
Electrical energy production transportation and distribution	3
Energetics of the blast furnace	3
<b>Total required</b>	<b>30</b>

<b>Semester 4</b>	
Master thesis	30
<b>Total</b>	<b>30</b>



"I have appreciated the close connection with teachers and doctoral candidates, always available and ready to help. Fascinated by laser technology, I have spent hours at the Laser Technology Competence Centre (LTCC), beside the studies. Furthermore, the mandatory internship has enabled me to make industry contacts and better understand their needs. I really recommend this Master, especially for the resources that are allocated per project."

**Quentin Ghysens, graduate**





# Master en Sciences de l'Ingénieur Efficacité Énergétique et Économique

120 ECTS

This Master enables students to acquire deeper knowledge in thermodynamics, mathematics and modern technologies needed to assess energy-related issues. The course combines technical elements with units from economical sciences and business administration in the aim of providing the full range of skills required for approaching technically and commercially energy related problems.

## STRENGTHS

- International approach to energy issues
- Collaboration with 3 universities (Université de Lorraine, HTW Saar and UCB Birkenfeld), 1 institution (European Investment Bank) and 5 industrials (Bosch, Buderus, DGNB, Paul Wurth and Schweizer Steimen)
- Possibility to obtain a double diploma with Hochschule für Technik und Wirtschaft des Saarlandes (HTW Saar) or Umwelt-Campus Birkenfeld (UCB)
- Compulsory third semester abroad at Université de Lorraine (Nancy), HTW Saar (Saarbrücken) or UCB (Birkenfeld). Other individual solutions are still possible.

## ADMISSION REQUIREMENTS

- Bachelor in Engineering or related field
- Languages: B2 in English and French

## CAREER OPPORTUNITIES

- PhD in engineering
- Engineer, manager, consultant in private and public sectors



"I opted for this Master as it combines the engineering science and economics, which are both of immense relevance nowadays. Students are taught not only how to solve any energy-related issue but also how to evaluate it from the financial point of view. The possibility to spend one semester abroad is a great opportunity to learn more about another country."

**Elena Sobon-Mühlenbrock, graduate**

In collaboration with:



## PROGRAMME AT A GLANCE

- **Duration:** 2 year full-time programme/ 4 semesters (120 ECTS)
- **Languages:** English (70%), French (30%)
- **Registration fees:** 200€/semester
- **Application period:**
  - For EU students: January - August
  - For non-EU students: January - April

## ADDITIONAL INFORMATION

### CONTACT

meee@uni.lu

### CAMPUS

Kirchberg and Belval

[meee.uni.lu](http://meee.uni.lu)



## PROGRAMME

Courses	ECTS
<b>Semester 1 - Université du Luxembourg (campus Kirchberg)</b>	
Computational fluid dynamics	3
Contrôle de gestion	4
Design and energetics of waste power plants - Schweizer Steimen -	3
Energetics of the blast furnace - Paul Wurth -	3
Mathematics	5
Notions générales de droit privé luxembourgeois	4
Thermodynamics	5
Urban planning & certification acc. to DGNB - k-engineer, e3consult -	3
<b>Total</b>	<b>30</b>

<b>Semester 2 - Université du Luxembourg (campus Kirchberg)</b>	
Circular economy in the construction sector	3
Energy efficiency of buildings	12
Financial accounting	2
Heat and mass transfer	5
Introduction aux décisions financières de l'entreprise	4
Large solar thermal systems - Buderus -	3
Principles of business administration: corporate finance	4
Policy, assessment & evaluation of energy projects on European level - European Investment Bank -	3
Simulations dynamiques TRNSYS	3
<b>Total required</b>	<b>39</b>

<b>Semester 3 - Compulsory semester abroad</b>	
<b>Université de Lorraine (campus Nancy)</b>	
Énergétique du bâtiment	6
Enveloppe et environnement du bâtiment	6
Initiation à la recherche - Projet transversal	3
Réglementation, labels, diagnostics	3
Simulation et contrôle du bâtiment	6
<b>Total</b>	<b>24</b>

<b>HTW Saar (campus Saarbrücken)</b>	
Unternehmensführung / Bilanzanalyse	6
Thesis	15
Kolloquium	3
<b>Electives:</b>	
Lean Production Konzepte und Praktiken	6
Energiehandel in der Praxis	3
Investitionsgütermarketing	3
Supply chain planning	6
Technisches Projekt	6
Computational fluid dynamics	6
Montagetechnik	3
Simulation von Umformprozessen mit FEM-Projekt	6
Produktionsmanagement	6
Heat- and mass transfer	6
Webbasiertes Wissensmanagement	6
Simulation in Produktion und Logistik	6
<b>Total required</b>	<b>30</b>

<b>UCB (campus Birkenfeld)</b>	
Bilanzierung und Controlling	5
Unternehmensführung	5
Prozessmanagement	5
Planungsseminar	5
Wirtschaftsethik und Kommunikation	10
Recht und Politik	5
Marketing	5
<b>Total required</b>	<b>30</b>

<b>Semester 4 - Université du Luxembourg (campus Kirchberg)</b>	
Master thesis	30
<b>Total</b>	<b>30</b>





# Master en Développement Durable Filière Énergie et Environnement

120 ECTS

Ce Master, développé en co-diplômation par l'Université du Luxembourg et l'Université de Liège, permet aux étudiants d'acquérir les compétences nécessaires pour appliquer une approche environnementale aux questions énergétiques et bâtiments durables. En outre, la mobilité des étudiants et enseignants permet une approche internationale de la question de l'énergie ainsi qu'une opportunité d'apprentissage des langues étrangères.

## ATOUTS

- Double diplôme de l'Université du Luxembourg et de l'Université de Liège
- Combinaison de cours techniques, sciences naturelles et humaines
- Approche multidisciplinaire et internationale

## CONDITIONS D'ADMISSION

- Bachelor ou Master en sciences exactes ou humaines
- Langues: niveau B2 en français et en anglais

## DÉBOUCHÉS

- Expert en énergie et environnement dans le secteur public ou privé
- Chercheur ou enseignant
- Conseiller en environnement
- Consultant au sein des bureaux d'études en environnement

En collaboration avec :



### PROGRAMME EN UN COUP D'ŒIL

- **Durée:** 2 ans à temps plein / 4 semestres (120 ECTS)
- **Langues:** français (85%), anglais (15%)
- **Frais d'inscription:**
  - 1<sup>ère</sup> année (Université de Liège): 835€
  - 2<sup>ème</sup> année (Université du Luxembourg): 400€
- **Périodes d'inscription:**
  - Etudiants UE: janvier - août
  - Etudiants non UE: janvier- avril

### INFORMATION ADDITIONNELLE

#### CONTACT

mdd@uni.lu

#### CAMPUS

Uni.lu: Kirchberg

ULiège: Arlon

[mdd.uni.lu](https://mdd.uni.lu)



## PROGRAMME

Cours	ECTS
<b>Semestre 1 - Université de Liège (campus Arlon)</b>	
Analyse des systèmes appliquée à l'environnement	2
Approche intégrée d'une question d'environnement	4
Approches scientifiques de l'environnement	4
Économie, énergie et environnement	2
Écosystèmes: états, impacts anthropiques et gestion	4
Éléments d'économie pour les sciences de l'environnement	2
Fondement de droit/politique de l'environnement	4
Introduction au développement durable	2
Pressions sur le sous-sol	3
Statistiques appliquées à l'environnement	3
<b>Total</b>	<b>30</b>

<b>Semestre 2 - Université du Luxembourg (campus Kirchberg)</b>	
Efficience énergétique des bâtiments	6
Matériaux de construction (analyse de cycle de vie)	3
Policy, assessment and evaluation of energy projects	3
Project	5
Sustainable transport systems	4
Sustainable water and resource management	4
Thermodynamique	5
<b>Total</b>	<b>30</b>

<b>Semestre 3 - Université de Liège (campus Arlon)</b>	
Analyse technico-économique des systèmes énergétiques	2
Climatisation des bâtiments	6
Impact environnemental et sanitaire des bâtiments	3
Optimisation énergétique du bâtiment et intégration des énergies renouvelables	3
Projet en énergies renouvelables et bâtiments performants	2
Production décentralisée et stockage de l'énergie	3
Réseaux d'énergie	4
Valorisation des énergies renouvelables	7
<b>Total</b>	<b>30</b>

<b>Semestre 4 - Université du Luxembourg ou de Liège</b>	
Master thesis	25
Stage	5
<b>Total</b>	<b>30</b>



"I decided to enroll in this Master in the interest of becoming more involved in the protection of the environment and in the fight against climate change. Throughout the MDD programme, I had the opportunity to discover and acquire valuable knowledge in various disciplines. The teaching activities provided are also well diversified (workshops, laboratory, study trips, summer project etc.) and the professors are helpful and highly qualified. I must say that I am particularly satisfied with the quality of teaching!"

**Michaél Rakotonjanahary, graduate**





# Doctoral Programme in Civil Engineering



This programme aims to provide research training in civil engineering and related scientific areas at an internationally competitive level following a multi-disciplinary scientific approach to the ever increasing complexity of modern engineering.

## RESEARCH TOPICS

- Structural engineering and building materials
- Sustainable construction and demountable structures
- Digital building and building information modelling
- Energy consumption, storage and production
- Geodesy and geospatial engineering
- Urban water management

## ADMISSION REQUIREMENTS

- Master in engineering sciences
- Candidates with a background in physics or mathematics may also be accepted, based on their motivation and potential for interdisciplinary research

## CAREER OPPORTUNITIES

- Graduates are regularly employed by national and international companies, Luxembourgish administrations and national and international research institutions

## PROGRAMME AT A GLANCE

- **Formal and informal teaching**
- **Research activities:** advanced courses, invited lectures, doctoral seminars
- **Language:** English
- **Disciplinary and transferable skills courses (20 ECTS)**
- **Number of doctoral candidates:** 23

## ADDITIONAL INFORMATION

### CONTACT

dpcive@uni.lu

### CAMPUS

Kirchberg



[dpcive.uni.lu](https://dpcive.uni.lu)



# Doctoral Programme in Mechanical/ Electro and Communications Engineering



The programme covers key aspects of a complete product life cycle. A principal theme of research projects is "construction and design" of product and systems focusing on sustainability. Specialisation can be selected from one of programme pillars: mechanical, electro and communications engineering.

## RESEARCH TOPICS

- Mechanical structures and systems
- High performance manufacturing
- Dynamic modelling of ground antennas
- Dynamic modelling of mechatronic systems

## ENTRY REQUIREMENTS

- Master in mechanical, electrical or related fields
- Candidates with Master in physics, mathematics or computer science focusing on interdisciplinary research are welcome as well

## CAREER OPPORTUNITIES

- Research and development
- Academia
- Engineering: automotive, machinery, telecommunication, power and energy

## PROGRAMME AT A GLANCE

- **Multinational dynamic team**
- **Multidisciplinary research activities**
- **Develop teaching skills**
- **Develop skills desirable in engineering**
- **Disciplinary and transferable skills courses (20 ECTS)**
- **Number of doctoral candidates:** 45

## ADDITIONAL INFORMATION

### CONTACT

dpmec@uni.lu

### CAMPUS

Kirchberg



[dpmec.uni.lu](https://dpmec.uni.lu)



"University of Luxembourg – an international and interdisciplinary environment with a plethora of unique learning opportunities. As a former doctoral candidate of the Geodesy and Geospatial Engineering group, I would like to witness the excellent mentorship, friendly working environment, the opportunities for international conference participations and the availability of computational and lab resources. Moreover, as a doctoral candidate, additional valuable skill sets could be obtained with the opportunities of assisting the teaching and mentoring activities of masters and bachelor students."

**Kibrom Ebuy, graduate**



"I am fortunate to have graduated with my doctorate in Engineering Sciences from the University of Luxembourg in an innovative and fascinating field. It was a real pleasure and a privilege to share this unique experience with supportive and helpful faculty members in a healthy multicultural environment with the best possible conditions for the research and continuing education."

**Pierre-Louis Ricci, graduate**





# Doctoral Programme in Computational Sciences



Data and computational sciences are multidisciplinary fields based on the idea that mathematics and computer science theories are used to address application domains within engineering, the natural sciences, the social sciences and the humanities.

## RESEARCH TOPICS

- Data: collect, store, analyse
- Model: derive analytical models
- Simulate: solve the resulting problems on high-performance computing architectures
- Evaluate: the accuracy of the simulations
- Drive and enrich: the models by (real-time) data acquisition
- Analyse: analyse the results and deduce

## ADMISSION REQUIREMENTS

- Master of science in exact, natural sciences, computer science or engineering science

## CAREER OPPORTUNITIES

- Data scientist
- Policy and decision making
- Research and Development
- Quant
- Academia
- Engineering
- Careers in application domains, e.g. natural, social sciences, humanities

## PROGRAMME AT A GLANCE

- Develop unique data science and computational skills transferrable to any domain
- Join a vibrant, familial & supporting team
- Learn how to communicate and visualise your science
- Benefit from personal coaching
- Language: English
- Disciplinary and transferable skills courses (20 ECTS)
- Number of doctoral candidates: 48

## ADDITIONAL INFORMATION

### CONTACT

dpcs@uni.lu

### CAMPUS

Belval

[dpcs.uni.lu](https://dpcs.uni.lu)



"I enjoyed working with Prof. Dr. Bordas and Dr. Beex as a doctoral candidate. I learned a lot from them and they supported me as much as they could to pursue my academic career."

**Hussein Rappel, graduate**





## Department of Engineering

The Department of Engineering (DoE) is an interdisciplinary group active in the classical domains of civil, electrical and mechanical engineering and geophysics. The main focus of research is on the development of technological solutions, the sustainable and economical use of all kind of resources, the offer of competences for the technological requirements of Luxembourg and the Greater Region industrial and public actors. Special emphasis is given to numerical simulation to reduce the required experimental effort, but the validation of the models will remain an essential asset.



## DoE at a glance

### MEMBERS

- 20 professors and lecturers
- 29 post-docs and 70 doctoral candidates
- 16 technical and administrative staff

### FUNDING AND COLLABORATIONS (2020)

- 45 new projects started: funding of ~ €10.7 million of which over 18% are funded by the European Commission
- €5.8 million acquired in 24 collaborative projects with industry and public institutions (FNR funded or directly sponsored by industry/institutions)

### PUBLICATIONS (2020)

- 205 peer-reviewed articles in scientific journals

### ADDITIONAL INFORMATION

#### CONTACT

doe@uni.lu

#### CAMPUS

Kirchberg

doe.uni.lu



## Research areas

### CIVIL AND ENVIRONMENTAL ENGINEERING

- High-performance and functional construction materials
- Efficient structural components
- Future oriented optimisation of structural composites, design methods and construction methods
- Up-scaling of innovative solutions
- Computational engineering and numerical simulations
- Life cycle and circular economy oriented construction engineering
- Urban water management and resource recovery
- Modelling transport

### COMPUTATIONAL ENGINEERING

- Computational mechanics
- Computational fluid dynamics and finite element method
- Statics and structural analysis

### ELECTRICAL COMMUNICATIONS ENGINEERING

- High frequency and microwaves
- Dynamic modelling of ground antennas
- Dynamic modelling of mechatronic systems

### ENERGY AND ENVIRONMENT

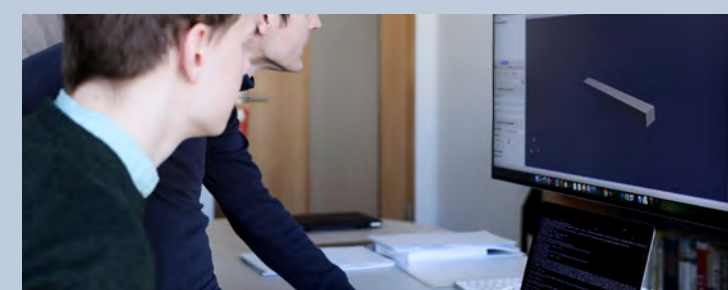
- Efficiency of thermal power plants and renewable energy production
- Eco-Driver assistance system for electric vehicles
- Energy efficient buildings, infrastructures and energy systems

### GEOPHYSICS

- Climate variability
- Geodynamics
- Resource management
- Regional processes

### MECHANICAL ENGINEERING

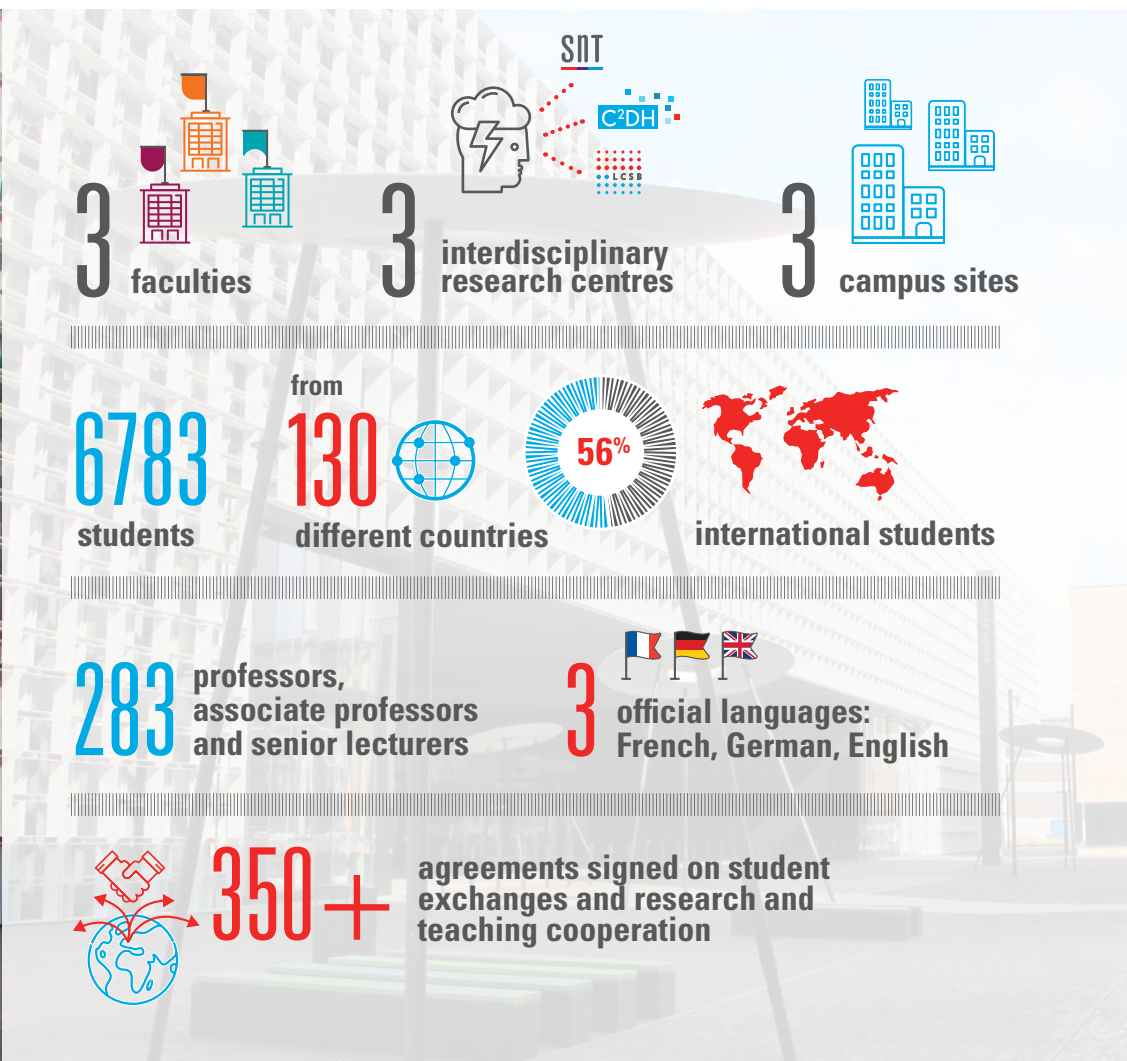
- High performance manufacturing
- Process engineering/chemical processes
- Mechanical construction including biomechanics
- Applied thermodynamics
- LuxCube





# Young, dynamic and international

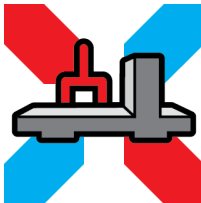
The University of Luxembourg is a European research-oriented university with a strong international and multilingual character. Founded in 2003, the university currently counts more than 6,000 students. Members of the university community come from all over the world.



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## Three campus sites



**Belval Campus**  
2 avenue de l'Université  
L-4365 Esch-sur-Alzette



**Kirchberg Campus**  
6 rue Richard Coudenhove-Kalergi  
L-1359 Luxembourg

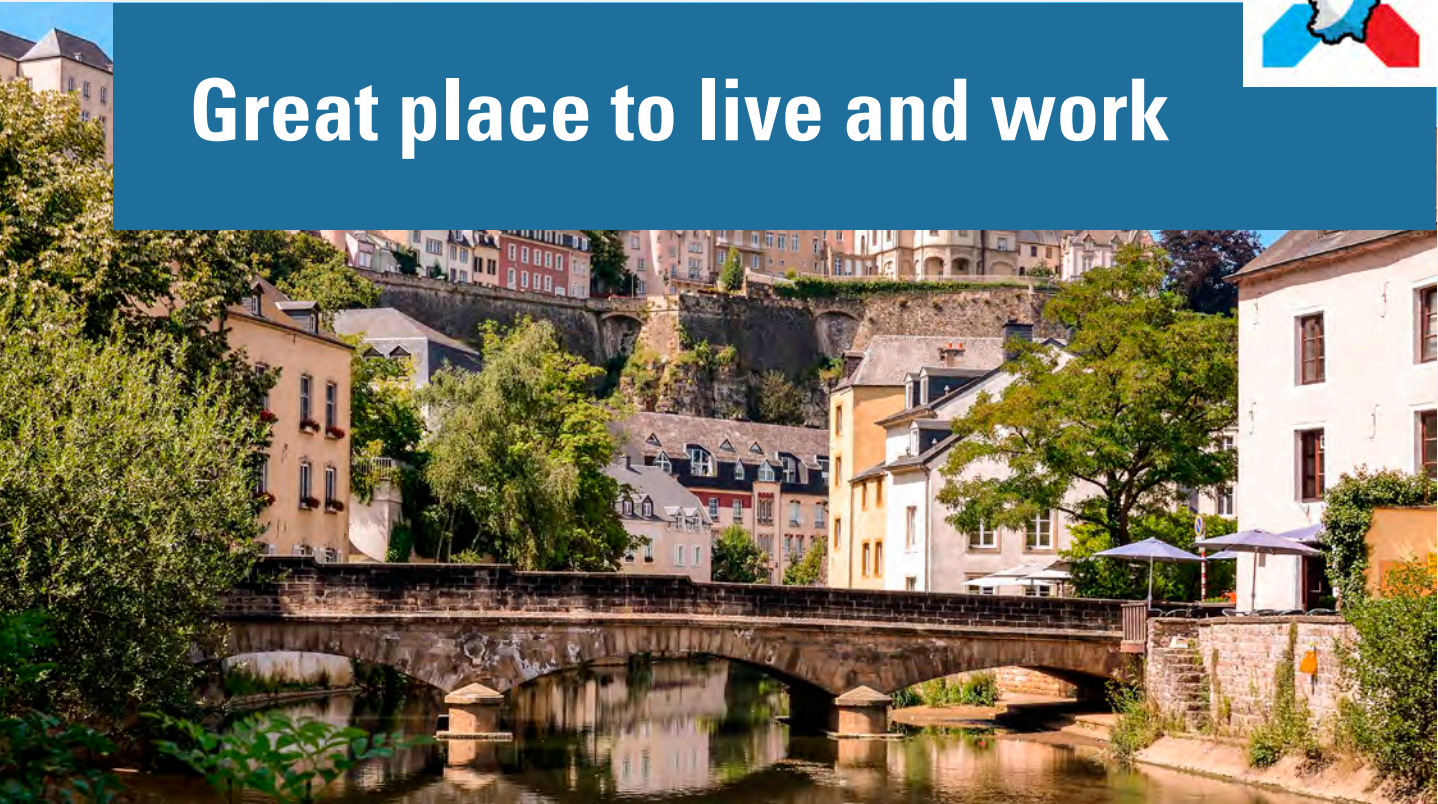


**Limpertsberg Campus**  
162 A avenue de la Faïencerie  
L-1511 Luxembourg





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## University of Luxembourg

■ Faculty of Science, Technology and Medicine

Campus Belval  
2, avenue de l'Université  
L-4365 Esch-sur-Alzette

Campus Kirchberg  
6, rue Richard Coudenhove-Kalergi  
L-1359 Luxembourg

Campus Limpertsberg  
162 A, avenue de la Faïencerie  
L-1511 Luxembourg

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