FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

ENGINEERING

"OUR VIRTUES AND OUR FAILINGS ARE INSEPARABLE, LIKE FORCE AND MATTER. WHEN THEY SEPARATE, MAN IS NO MORE."

NIKOLA TESLA

uni.lu
UNIVERSITÉ DU LUXEMBOURG

WE DEVELOP

TALENTS

FSTM has a key mission: attract and train the talents that Luxembourg and the world will need in the STEM fields (Science, Technology, Engineering and Mathematics) as well as in Medicine.

CONTENTS

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

The Faculty of Science, Technology and Medicine (FSTM) contributes multidisciplinary expertise in the fields of Mathematics, Physics, Engineering, Computer Science, Life Sciences and Medicine. Through its dual mission of teaching and research, the FSTM seeks to generate and disseminate knowledge and train new generations of responsible citizens, in order to better understand, explain and advance society and environment we live in.

1 Faculty

5 Departments

3 Campus sites

5 Disciplines

41 Study programmes

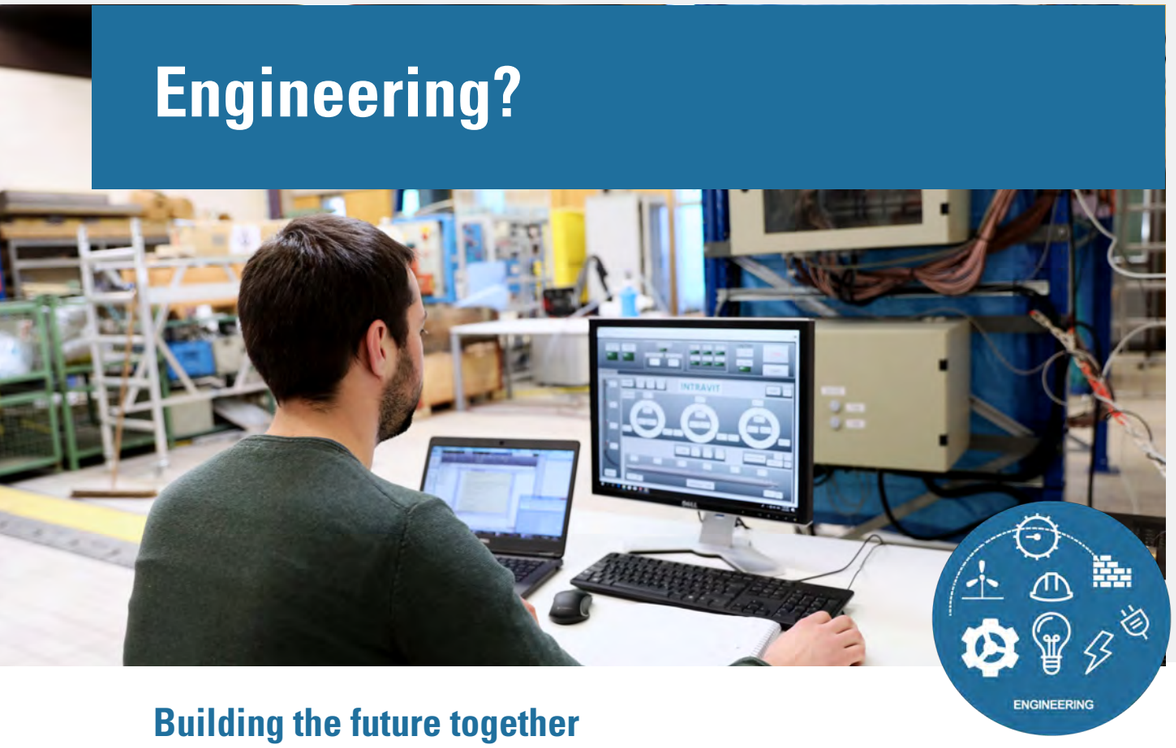
3 Official languages

2,000 Students

130 Countries

56% International students

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 4,700 companies employing 47,700 persons, the building sector is the one with the largest number of companies that employs the most people[1]. 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 buidling 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.

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.

1 Source: Brochure « Les qualifications de demain dans l'industrie », Fedil, 2021

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 2021-2023, 817 new hires are planned and Bachelor and Master/ doctorate degrees are mainly sought in the fields of management and technique[1]. Also, in the Greater Region and the European neighbour countries, the employability of young engineers and the perspectives for young graduated engineers are excellent.

1 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

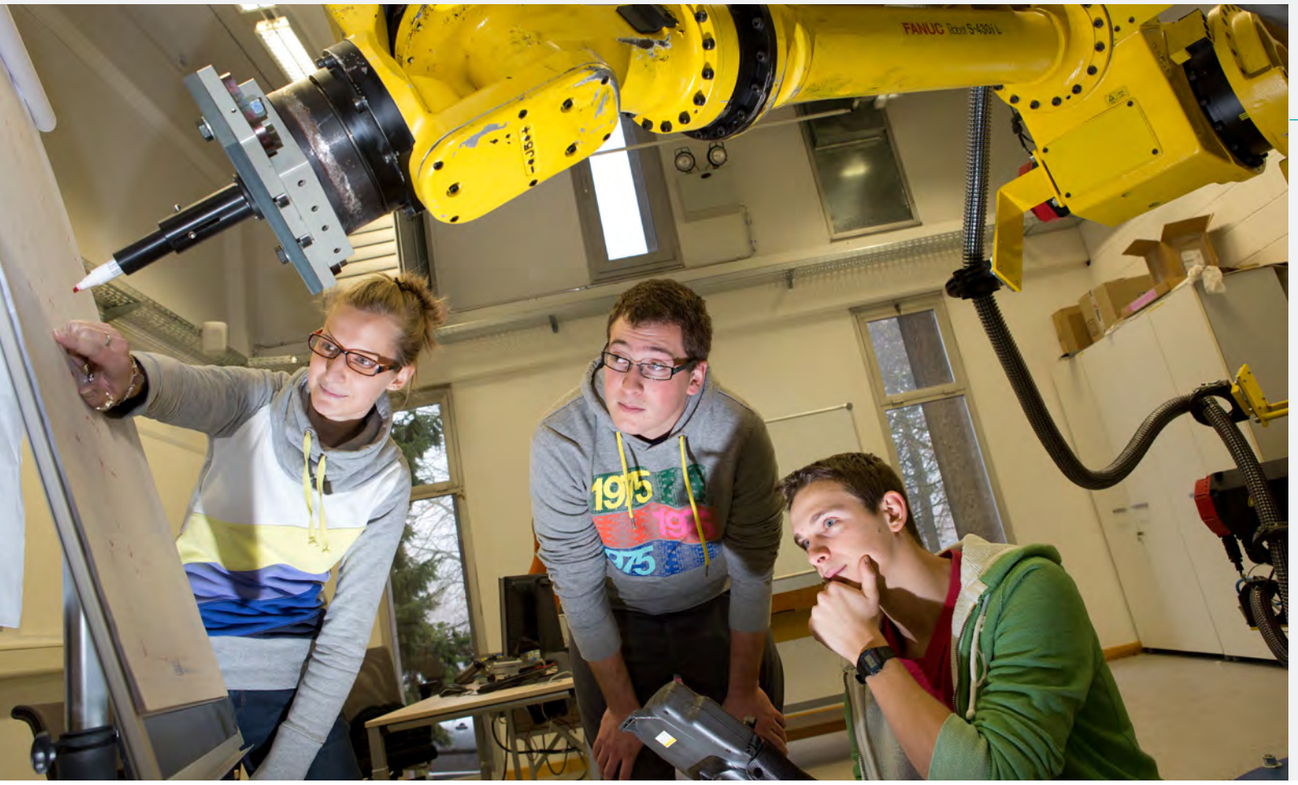
We work closely with the industry, enabling you to acquire knowledge and experience from leading companies, including working with industrial mentors and the opportunity to spend time with them on internships.

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 Engineering Sciences

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: Februar - Juli
  → Nicht-EU Studenten: Februar - April

ZUSÄTZLICHE INFORMATIONEN

KONTAKT

beng@uni.lu

CAMPUS

Kirchberg

beng.uni.lu

"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

Elektrotechnik

Kurse	ECTS
Semester 1	
Artificial intelligence for smart technologies	3
Digitaltechnik	3
Elektrotechnik	5
Informatik	5
Mathematik	6
Messtechnik	3
Physique	4
Total	**29**

Semester 2	
Elektronik & Photonik	5
Elektrotechnik	4
Industrial workshop	3
Informatik	4
Leistungselektronik	3
Mathematik	6
Mikroprozessor	4
Telekommunikation	2
Total	**31**

Semester 3	
CAO – Schaltungssimulation	4
Elektronik & Photonik	3
Elektrotechnik	3
Mathematik	6
Mikroprozessor	4
Regelungstechnik	5
Technik der Netze	5
Total	**30**

Semester 4	
Mobilitätssemester	30
Total	**30**

Semester 5	
Business management für Studierende im Ingenieurwesen	4
Digital design	4
Electrical energy production, transportation and distribution	3
Elektrische Maschinen	4
Leistungselektronik	6
Signale und Systeme	4
Technik der Netze	5
Wahlfächer:	
- Automatisierungstechnik	5
- Estimation approaches in advanced engineering systems	4
Total	**30**

Semester 6	
Bachelor thesis	12
Elektrische Energieverteilung Vertiefung	2
Leistungselektronik (& dezentrale Systeme)	5
Prototyp Mikroelektronik	4
Real world data acquisition and processing	3
Regelungstechnik	4
Total	**30**

Energie und Umwelt

Kurse	ECTS
Semester 1	
CAD	5
Elektrotechnik	5
Informatik	5
Mathematik	6
Physique/Chemie	5
Technische Mechanik	5
Total	**31**

Semester 2	
Bauphysik	4
Design project based learning	3
Mathematik	6
Technische Mechanik	5
Thermodynamik	5
Werkstoffkunde	6
Total	**29**

Semester 3	
Erneuerbare Energien	3
Fluid mechanics	4
Gebäudetechnik	5
Mathematik	6
Raumplanung & Verkehrsplanung	4
Thermodynamik	5
Wasserinfrastruktur	2
Total	**29**

Semester 4	
Mobilitätssemester	30
Total	**30**

Semester 5	
Automatisierungstechnik	5
Business management für Studierende im Ingenieurwesen	4
Energy systems	5
Finite Elemente Methode für thermische Anwendungen	5
Regelungstechnik	5
Spezialisierung - Gebäudeenergie und Umweltthemen *(7 ECTS to choose)*	
Législation	3
Siedlungswasserwirtschaft	5
Stätebau & Landesplanung	5
Workshop Energiepass	3
Spezialisierung - Nachaltige Energietechnologien	
Electrical energy production, transportation and distribution	3
Wärmeübertragung	4
Total	**31**

Semester 6	
Bachelor thesis	12
Brennstoffe - Verbrennung - Abgasreinigung	4
Energy systems	5
Spezialisierung - Gebäudeenergie und Umweltthemen	
Abfallwirtschaft & Altlasten	4
Gebäudetechnik	5
Spezialisierung - Nachaltige Energietechnologien	
Chemische Thermodynamik und Reaktionskinetik	5
Hydraulische Maschinen	4
Total	**30**

Bauingenieurwesen

Kurse	ECTS
Semester 1	
Baukonstruktion	5
CAD	5
Informatik	5
Mathematik	6
Physique/Chemie	5
Technische Mechanik	5
Total	**31**

Semester 2	
Bauphysik	4
Baustoffkunde	6
Design project based learning	3
Mathematik	6
Technische Mechanik	5
Vermessungskunde	5
Total	**29**

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

Semester 4	
Mobilitätssemester	30
Total	**30**

Semester 5	
Bodenmechanik	3
Hydromechanik	2
Spezialisierung - Konstruktives Bauingenieurwesen	
Advanced Structural Analysis	5
Massivbau	5
Stahlbau	5
Tragwerkslehre & Computer Aided Engineering	5
Wahlfach Infrastrukturwesen	5
Spezialisierung - Infrastrukturwesen	
Siedlungswasserwirtschaft	5
Städtebau und Landesplanung	5
Trafic infrastructure design	5
Wahlfach Konstruktives Bauingenieurwesen	5
Wasserbau & Wasserwirtschaft	5
Total	**30**

Semester 6	
Bachelor thesis	12
Bauwirtschaft	4
Building information modelling	5
Grundbau / Baugruben	5
Wahlfächer:	
- Abfallwirtschaft & Altlasten	4
- Baubetrieb	4
- Cartographie & GIS	3
- Einführung Ingenieurholzbau	3
- 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
Semester 1 - Université de Lorraine, Metz	
Baubetrieb	2
Baukonstruktionslehre	2
Baustoffkunde	3
Englisch	3
Festigkeitslehre	2
Fremdsprachen	4
Interkulturelles Management	2
Mathematik	6
Statik	4
Topographie	2
Total	**30**

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

Semester 3 - Université du Luxembourg	
Baubetrieb	3
Baukonstruktion	5
Gebäudetechnik	5
Législation	3
Massivbau (Wahlfach)	3
Raumplanung & Verkehrsplanung	4
Stahlbau (Wahlfach)	3
Technische Mechanik	5
Wasserinfrastruktur	2
Total	**30**

Semester 4 - Université du Luxembourg	
Baubetrieb	4
Bauphysik	4
Baustoffkunde	6
Bauwirtschaft	4
Einführung Ingenieurholzbau	3
Gebäudetechnik	5
Technische Mechanik	5
Total	**31**

Semester 5 - HTW Saarbrücken	
Pratktische Studienphase	22
Projekt	8
Total	**30**

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

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

Maschinenbau

Kurse	ECTS
Semester 1	
CAD	5
Elektrotechnik	5
Informatik	5
Mathematik	6
Physique/Chemie	5
Technische Mechanik	5
Total	**31**

Semester 2	
Design project based learning	3
Informatik	4
Mathematik	6
Technische Mechanik	5
Thermodynamik	5
Werkstoffkunde	6
Total	**29**

Semester 3	
Fertigungstechnik	5
Fluid mechanics	4
Machine design	5
Mathematik	6
Regelungstechnik	5
Technische Mechanik	5
Total	**30**

Semester 4	
Mobilitätssemester	30
Total	**30**

Semester 5	
Business management für Studierende im Ingenieurwesen	4
Electrical energy production, transportation and distribution	3
Finite Elemente Methode für dynamische Anwendungen	5
Machine design	9
Oelhydraulik	4
Thermodynamik	5
Total	**30**

Semester 6	
Bachelor thesis	12
Machine design	7
Fertigungstechnik	5
Robotik	3
Wahlfächer:	
- Contrôle non destructif	4
- Digital rapid prototyping	5
- Hydraulische Maschinen	4
- Pneumatik	3
Total	**30**

Digitales Ingenieurwesen

Kurse	ECTS
Semester 1	
Artificial intelligence for smart technologies	3
Digitaltechnik	3
Elektrotechnik	5
Informatik	5
Mathematik	6
Physique	4
Technische Mechanik	5
Total	**31**

Semester 2	
Informatik	4
Mathematik	6
Mikroprozessor	4
Technische Mechanik	5
Thermodynamik	5
Wahlfächer:	
- Elektrotechnik	4
- Telekommunikation	2
Total	**30**

Semester 3	
Business management für Studierende im Ingenieurwesen	4
CAD	5
Gebäudetechnik	5
Mathematik	6
Regelungstechnik	5
Technik der Netze	5
Total	**30**

Semester 4	
Mobilitätssemester	30
Total	**30**

Semester 5	
Automatisierungstechnik	5
Cloud based applications	4
Database management	4
Digital design	4
Machine design	5
Software engineering	3
Technik der Netze	5
Wahlfächer:	
- Energy systems	5
- Estimation approaches in advanced engineering systems	4
- Signale und Systeme	4
Total	**30**

Semester 6	
Bachelor thesis	12
Wahlfächer *(17 ECTS to choose)*:	
- Building information modelling	5
- Cartographie & GIS	3
- Digital rapid prototyping	5
- Energy systems	5
- Interaction design	4
- Real world data acquisition and processing	3
- Robotik	3
- Workshop project management	2
Total	**29**

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 larger 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 reduced consumption of in construction materials and natural resources. This dual focus on megastructures and sustainability sets us apart from other masters of civil engineering.

STRENGTHS

- Focus on complex projects and sustainability
- Collaboration with construction companies and administrations

ADMISSION REQUIREMENTS

- Bachelor degree in civil engineering
- 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: February - July
  → For non-EU students: February - April

ADDITIONAL INFORMATION

CONTACT

msce@uni.lu

CAMPUS

Kirchberg and Belval

msce.uni.lu

"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

PROGRAMME

Courses	ECTS
Semester 1	
Circular economy in the construction sector	3
Concrete structures	5
Finite element analysis of structures (incl. MatLab)	5
Life cycle assessment and eco design	3
Methods in digital building - BIM	4
Steel & composite structures - High rise buildings	5
Thin walled structures	5
Total	**30**
Semester 2	
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 (Advanced soil mechanics)	3
Total	**30**
Semester 3	
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
Total	**30**
Semester 4	
Master thesis	30
Total	**30**

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: February - August
  → For non-EU students: February - April

INTERNSHIP

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

ADDITIONAL INFORMATION

CONTACT

mspc@uni.lu

CAMPUS

Kirchberg and Belval

mspc.uni.lu

"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

PROGRAMME

Courses	ECTS
Semester 1	
Assembly and testing technologies	4
Life cycle assessment and eco design	3
Programming for engineers (Matlab & Python)	4
Project management	4
Supply chain and logistics	4
Elective 1: Mechanics	
Assessment of finite element calculations	3
CAD and CAE	4
Machine design	4
Elective 2: Electrical and Computer Engineering	
Communication theory	3
Networking	3
Sensors & signal processing	3
Technical energy systems modeling and simulation	4
Total required (if Elective 1)	**30**
Total required (if Elective 2)	**32**

Semester 2	
Managerial accounting	3
Product planning & marketing for engineers	3
Programming for engineers	4
Robotics	4
Elective 1: Mechanics	
Advanced control	3
Advanced engineering materials	4
Digital factory planning	3
Laser technology for manufacturing	4
Machine design exercise	3
Elective 2: Electrical and Computer Engineering	
Information theory and coding	5
Networked feedback systems	5
Quality of service in computer networks	5
Total required (if Elective 1)	**31**
Total required (if Elective 2)	**29**

Semester 3	
Advanced project / Case study	12
Integrated management systems	3
Operational excellence	2
Scientific writing and presentation skills	3
Elective 1: Mechanics	
Electrical energy production transportation and distribution	3
Energetics of the blast furnace	3
Sensors & signal processing	3
Elective 2: Electrical and Computer Engineering	
Artificial intelligence	5
Estimation approaches in advanced engineering systems	4
Total required (if Elective 1)	**29**
Total required (if Elective 2)	**29**

Semester 4	
Master thesis	30
Total	**30**

Master en Sciences de l'Ingénieur Efficacité Énergétique et Économique

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)
- Possibilty to obtain a double diploma with Hochschule für Technik und Wirtschaft des Saarlandes (HTW Saar) or Umwelt-Campus Birkenfeld (UCB)
- Third semester at University of Luxembourg or abroad: Université de Lorraine (Nancy), HTW Saar (Saarbrücken) or UCB (Birkenfeld) or as a free mover

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

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: February - August
  → For non-EU students: February - April

ADDITIONAL INFORMATION

CONTACT

meee@uni.lu

CAMPUS

Kirchberg and Belval

meee.uni.lu

"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

PROGRAMME

Courses	ECTS
Semester 1 - Université du Luxembourg (campus Kirchberg/Belval)	
Case studies in finance	4
Computational fluid dynamics	3
Computational sciences	5
Contrôle de gestion	4
Energetics of the blast furnace	3
Production et distribution de l'énergie électrique	3
Thermodynamics	5
Urban planning and certification acc. to DGNB	3
Total	**30**

Semester 2 - Université du Luxembourg (campus Kirchberg/Belval)	
Cost accounting for engineering managers	4
Efficience énergétique des bâtiments	7
Energy efficiency of buildings	7
Financial reporting & compliance	4
Heat and mass transfer	5
Introduction aux décisions financières de l'entreprise	4
Policy, assessment and evaluation of energy projects on European level	3
Total required	**34**

Semester 3 - Université du Luxembourg or abroad	
Advanced Control of Electrical Energy	3
Gestion Intelligente de l'Energie avancée	4
H2 combustion engines/turbines	3
Hydrogen systems	4
Initiation to project work: Techno-Economical Energy Project	4
Integrated Energy Systems	5
Introduction to the TRNSYS simulation program /on site: Ulg: Campus d'Arlon	1,5
Large solar thermal systems/Bosch-Buderus, Luxembourg	1,5
Total	**26**

Semester 4 - Université du Luxembourg (campus Kirchberg)	
Master thesis	30
Total	**30**

Master en Développement Durable
Filière Énergie et Environnement

Ce Master, developpé en co-diplômation par l'Université du Luxembourg et l'Université de Liège, permet aux étudiants d'acquérir les compétences necessaires 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

- Douple 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 :

LIÈGE université
Arlon Campus Environnement

PROGRAMME EN UN COUP D'ŒIL

- **Durée:** 2 ans à temps plein / 4 semestres (120 ECTS)
- **Langues:** français (85%), anglais (15%)
- **Frais d'inscription:**
  → 1ère année (Uni de Liège): voir sur leur site
  → 2ème année (Uni du Luxembourg): 400€
- **Périodes d'inscription:**
  → Etudiants UE: février - août
  → Etudiants non UE: février- avril

INFORMATION ADDITIONNELLE

CONTACT

mdd@uni.lu

CAMPUS

Uni.lu: Kirchberg
ULiège: Arlon

mdd.uni.lu

"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

PROGRAMME

Cours	ECTS
Semestre 1 - Université de Liège (campus Arlon)	
Analyse des systèmes appliquée à l'environnement	2
Biodiversité et sociétés	4
Économie, énergie et environnement	2
Environnement sol	4
Fondement de droit / politique de l'environnement	3
Gestion intégrée de l'énergie	4
Gestion intégrée et participative des ressources en eau	4
Introduction à l'anthropocène	2
Qualité de l'air: Pression, Etat, Réponse	4
Total	**29**

Semestre 2 - Université du Luxembourg (campus Kirchberg/Belval)	
Circular economy in construction sector	3
Efficience énergétique des bâtiments	3
Energy efficiency of buildings	7
Initiation to Project Work	2
Policy, assessment and evaluation of energy projects on European level	3
Sustainable water and resource management	4
Thermodynamics	5
Transport systems analysis	4
Total	**31**

Semestre 3 - Université de Liège (campus Arlon)	
Analyse technico-économique des systèmes énergétiques: théorie et projet	4
Introduction aux risques environnementaux et sanitaires	5
Production décentralisée et stockage de l'énergie	3
Théories et gestions des transitions écologiques	5
Valorisation des énergies renouvelables	4
Cours au choix (2 cours pour un total de 8 ECTS)	
Dimensionnement et simulation des systèmes énergétiques du bâtiment	4
Gestion quantitative et qualitative des eaux souterraines	4
Modélisation de la dispersion atmosphérique	4
Optimisation énergétique du bâtiment et intégration des énergies renouvelables	4
Outils d'analyse et d'aide à la décision pour une gestion intégrée des ressources en eau	4
Politiques et actions publiques	4
Réseaux d'énergie, les systèmes d'énergie électrique ; les réseaux de chaleur	4
Systèmes de production agricole et sécurité alimentaire	4
Total	**30**

Semestre 4 - Université du Luxembourg ou de Liège	
Master thesis	25
Stage	5
Total	**30**

Doctoral Programme in Engineering Sciences

This programme offers reserach training in the disciplines civil, environmental and geospatial engineering as well as in energy, mechanical, manufacturing, electrical and communications engineering at an internationally competitive level following a multisciplinary scientific approach to the ever increasing complexityof modern engineering.

RESEARCH TOPICS

Structural engineering and construction informatics, Sustainable construction and building materials, Soil mechanics and geotechnics, Resource and urban water management, Geodesy and geospatial engineering, Mechanical strcutures, systems and materials, Addictive and high-performance manufacturing, Energy production, storage, distribution and consumption, Automation and mechatronics systems, Chemical processes and biomechanics

ADMISSION REQUIREMENTS

- Master in engineering sciences
- Candidates with a background in physics, mathematics or computer sicence focusing on interdisciplinary research are welcome as well

CAREER OPPORTUNITIES

- Graduates are regularly employed by national and international companies, by institutions and Luxembourgish administrations in various areas such as construction, infrastructure, automotive, machinery, telecommunication, power and energy

PROGRAMME AT A GLANCE

- **Multidisciplinary research activities**
- **Disciplinary and transferable skills courses** (20 ECTS)
- **Duration:** 36 to 48 months
- **Language:** English
- **Registration fees:** 200 €/semester
- **Number of doctoral candidates:** 61

ADDITIONAL INFORMATION

CONTACT

dpes@uni.lu

CAMPUS

Kirchberg and Belval

dpes.uni.lu

"I was fortunate to carry out my PhD in an inspiring, innovative, professional, international and interdisciplinary working environment. The level of cooperation, support and expertise from the different members were outstanding. Furthermore, the access to state-of-the-art research facilities and the available resources as well as the great opportunities to collaborate closely with the main actors of the Luxembourgish construction industry have endorsed a greater value, a higher relevance and a broad approval to the findings of my research project."

Vishojit B.Thapa, 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

- **Join a vibrant, familial & supporting team**
- **Learn how to communicate and visualise your science**
- **Duration:** 36 to 48 months
- **Language:** English
- **Disciplinary and transferable skills courses** (20 ECTS)
- **Registration fees:** 200 €/semester
- **Number of doctoral candidates:** 49

ADDITIONAL INFORMATION

CONTACT

dpcs@uni.lu

CAMPUS

Belval

dpcs.uni.lu

"I really appreciated the constant support in providing an excellent infrastructure, quality courses, and participating in several international events favouring innovation and new collaborations. I would like to acknowledge my supervisor Stéphane Bordas for trusting me on this project and warmly integrating me into his talented team."

Arnaud Mazier, 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

- 21 professors and lecturers
- 32 post-docs and 79 doctoral candidates
- 15 technical and administrative staff

FUNDING AND COLLABORATIONS (2022)

- €5.5 million in 32 new project, 60% as collaborative projects with industry and public institutions (FNR funded or directly sponsored by industry/institutions)

PUBLICATIONS (2022)

- 164 peer-reviewed articles in scientific journals

ADDITIONAL INFORMATION

CONTACT

doe@uni.lu

CAMPUS

Kirchberg

doe.uni.lu

Research areas

CIVIL AND ENVIRONMENTAL ENGINEERING

- Construction and building informatics
- High-performance construction materials, components and composites
- Soil mechanics and geotechnics
- Sustainability and circular economy in construction
- Transportation engineering and network modelling, smart mobility
- Urban water management and resource recovery

COMPUTATIONAL ENGINEERING & SCIENCES

- Advanced discretisation methods, graph analytics, and data analysis
- Data-driven computational modelling, prediction and inference
- Mathematical modelling of advanced materials, multi-physics and multi-scale problems
- Scalable scientific software for HPC-enabled numerical simulations in engineering
- Socio-Environmental data acquisition and modelling
- Uncertainty quantification and optimisation of technical systems

ELECTRICAL & COMMUNICATION ENGINEERING

- Advanced sensors and sensor-based monitoring
- Diagnostic and self-healing systems
- Estimation and identification of biomedical signals
- Mechatronic systems and robotic controls

ENERGY TECHNOLOGY & ENGINEERING

- Energy efficient buildings, infrastructures and energy systems
- Intelligent and resilient energy management, distribution and grids
- Renewable energy production and efficiency of thermal power plants

GEOPHYSICS, GEODESY & GEOSPATIAL SCIENCE

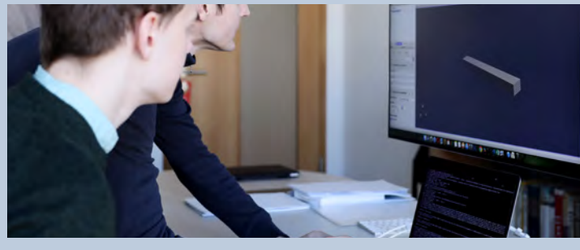
- 3D reality capture and data-driven analyses methods
- Climate variability, atmospheric sensing and resource management
- Geodynamics and high-precision deformation monitoring

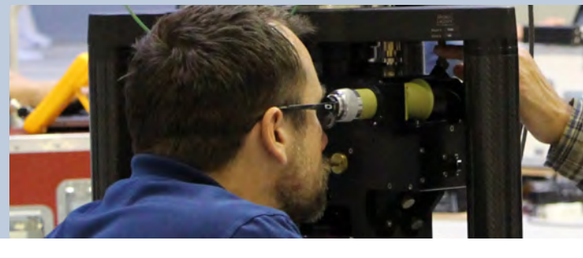
MANUFACTURING & MATERIAL ENGINEERING

- Data-driven methods in manufacturing
- High performance manufacturing and additive manufacturing
- High performance materials engineering
- Machine design and computer-aided engineering

MECHANICAL ENGINEERING

- Applied thermodynamics
- Industry 4.0
- Mechanical construction including biomechanics
- Process engineering/chemical processes





Young, dynamic and international

DISCOVER THE

UNIVERSITY OF LUXEMBOURG

With more than 6,780 students from all over the world, the University of Luxembourg has an international and multilingual character that offers its students a higher search-oriented education.

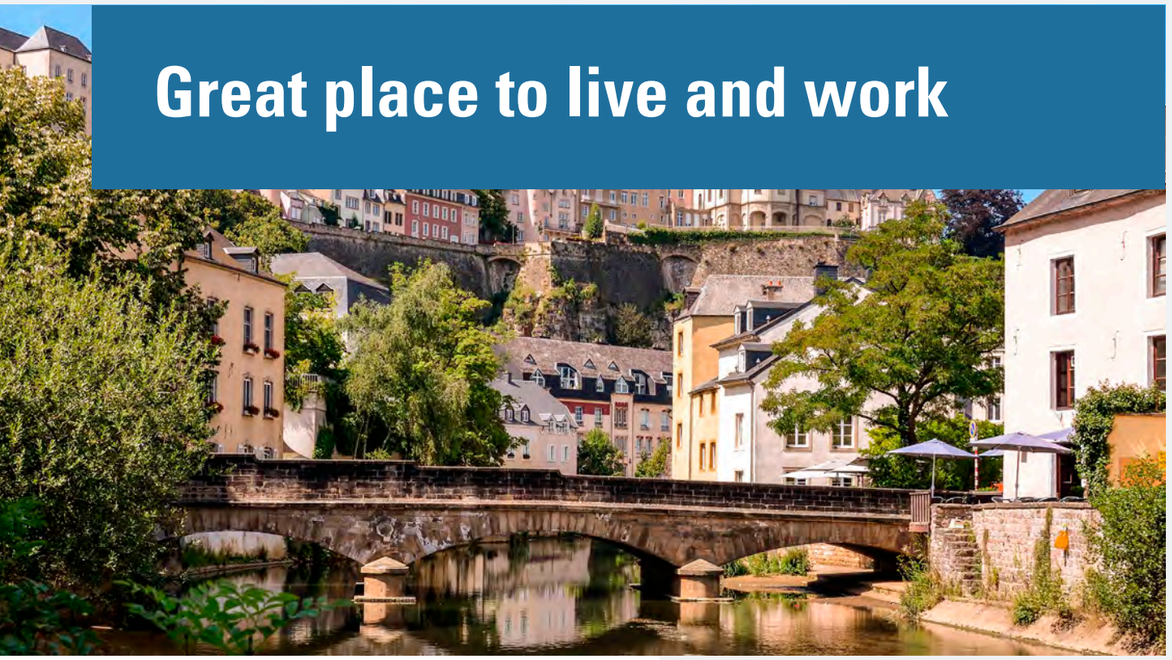
Three campus sites

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

Great place to live and work



Located in the heart of Europe, the Grand Duchy of Luxembourg boasts a colourful history, stunning landscape, multicultural environment and multilingual population. The thousand year old capital and five regions each have their own unique flavour and discoveries to be made. Experience contemporary and historic culture, explore the country's hiking and cycling trails, and taste world-class cuisine and local wine.

visitluxembourg.com

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
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L-1511 Luxembourg

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