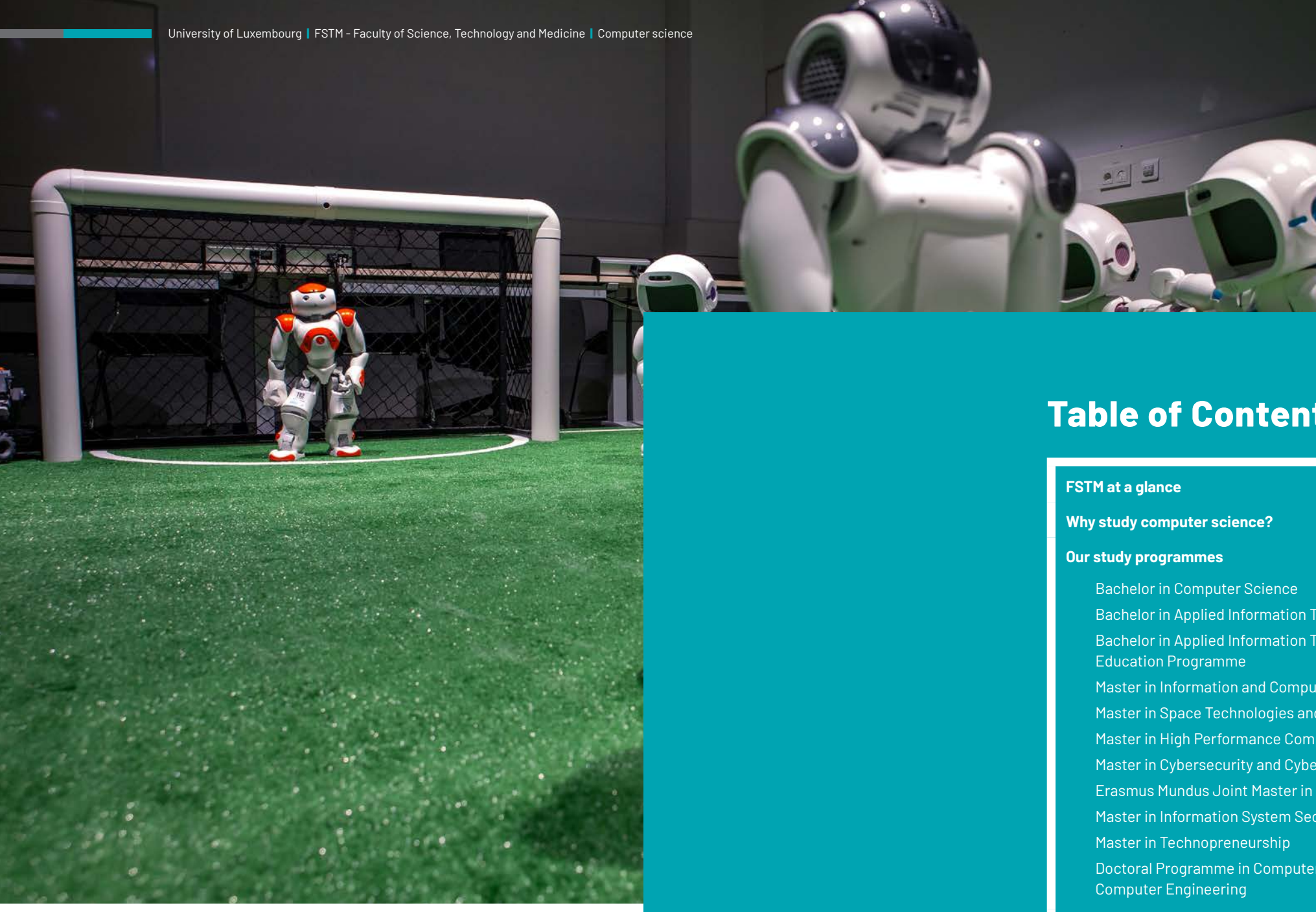
FACULTY OF SCIENCE,
TECHNOLOGY AND
MEDICINE

Bachelor,
Master and PhD

Computer science



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 Health and Life Sciences.

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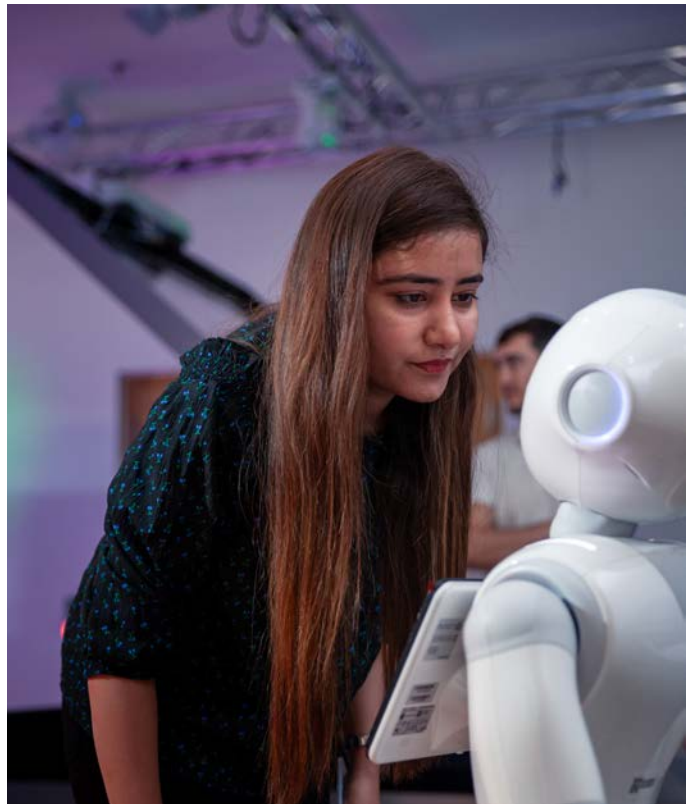
The Faculty of Science, Technology and Medicine (FSTM) **at a glance**

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

39
Study programmes

3
Official languages

2 000
Students

130
Countries

56 %
International students

Why study **Computer Science?**

Booming ICT sector: Luxembourg waits for you!

DIGITAL PIONNEER

Luxembourg is already a prime location for companies from the ICT sector, which value guidance and modern infrastructures. ICT specialists represent 6.7% of Luxembourg's domestic employment which ranks third in the European Union.

ARTIFICIAL INTELLIGENCE

In a digital world filled with data, artificial intelligence (AI) has the potential to revolutionise human life like few other technologies did before. This is why Luxembourg got into artificial intelligence to become one of the most developed digital societies. The strategic vision of Luxembourg is based on the country's ambition to position itself as a pioneer in the digital field.

DATA ECONOMY

High performance computing, high performance data analysis and artificial intelligence are cornerstones of European, national and university strategies. The new generations of supercomputers coupled with the existing high-level expertise in the field will boost research.

CYBERSECURITY

Luxembourg thinks of information security as a major factor of economic attractiveness. Luxembourg is 11th in the world on the Global Cybersecurity Index, and is the promoter of many collaborative projects in this field.

MAJOR PLAYERS

Luxembourg has succeeded in attracting major international players, such as Amazon, eBay, Google, PayPal or Skype, as well as many other companies specialised in online video game or digital book. In addition, Luxembourg includes highly efficient local players in electronic security (LuxTrust) and high-speed connectivity (Post Luxembourg, Data Center Luxembourg, etc.).

Crucial need of ICT staff: get a Bachelor or more!

The country's share of ICT specialists and graduates is higher than the EU average, but there is still a shortage of ICT specialists[1]. Companies have high training requirements. "BAC +2" is the minimum. University graduates are the most sought-after: 60.4% job offers require a Master degree or PhD, 29.4% require a Bachelor degree[2].

For the period 2022-2024, 687 new hires are planned for Luxembourg as: programmer, systems administrator, business analyst, network administrator, system engineer, project/product manager, helpdesk support technician, software architect, customer support technician[2].

[1] Source : Digital Economy and Society Index (DESI), 2022
[2] Source: Report : « ICT: Jobs with a future! », 2022

Excellent ICT training **Join our University!**

By joining us, you will benefit from many advantages:

COMPLETE TRAINING OFFER

We offer multilingual Bachelor, Master, doctoral and vocational training programmes in computer science 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.

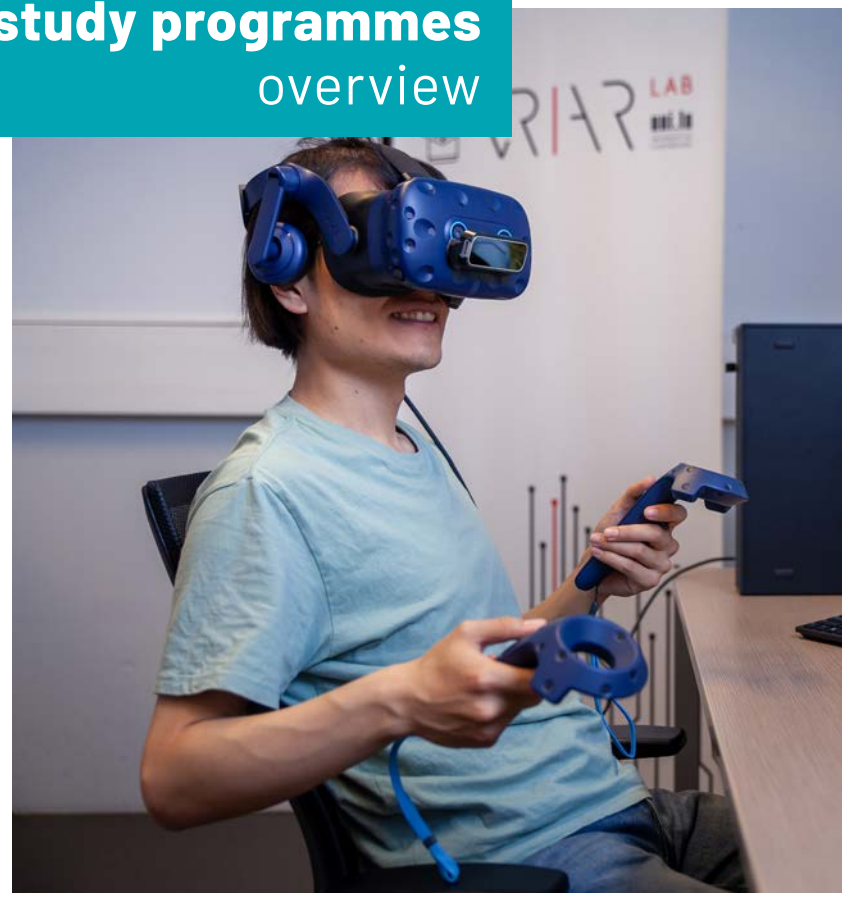
CLOSE COLLABORATION WITH RESEARCH

Early involved in research project, you will work with staff conducting latest research, gaining in-depth knowledge from experts working at the forefront of the subject. The Department of Computer Science (DCS) conducts fundamental and applied research in the area of computer, communication and information sciences.

STRONG LINKS WITH INDUSTRY

We work closely with 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 computer science. Join the University of Luxembourg now!

Our study programmes
overview



BACHELORS

3 YEARS

Bachelor in Computer Science

180 ECTS

Bachelor in Applied Information Technology

180 ECTS

Bachelor in Applied Information Technology – Continuing Education Programme

180 ECTS

University of Luxembourg | FSTM - Faculty of Science, Technology and Medicine | Computer science

MASTERS

2 YEARS

Master in Information and Computer Sciences

120 ECTS

Master in Space Technologies and Business

120 ECTS

Master in High Performance Computing

120 ECTS

Master in Cybersecurity and Cyber Defence

120 ECTS

Erasmus Mundus Joint Master in Cybersecurity

120 ECTS

MASTERS

2 YEARS

Master in Information System Security Management

60 ECTS

Master in Technopreneurship

60 ECTS

DOCTORAL EDUCATION

Doctoral Programme in Computer Science and Computer Engineering

RESEARCH
+ 20 ECTS

Bachelor in Computer Science

180 ECTS

This Bachelor provides the bases on the three following main dimensions: creativity to be able to generate new ideas ; science to acquire precise knowledge determined using observations, experimentations, reasonings and expressions and digital technologies to rely on electronic devices and get used to process information.

STRENGTHS

- Pedagogy based on acquisition by practice through research and development projects
- Scientific quality to enhance your interest and strengths in science and technology for the future
- Strong links with national stakeholders

ADMISSION REQUIREMENTS (75 PLACES)

- Degree: Secondary school diploma
- Language: B2 in English

STUDY OPPORTUNITIES

- Master in Computer Science or related field

Programme at a glance

- Duration: 3 year full-time programme/ 6 semesters (180 ECTS)
- Language: English
- Registration fees: 400€/semester
- Available places: 75
- Application period:
  > For EU students: February-July
  > For non-EU students: February-April

Additional information

CONTACT
bics@uni.lu

CAMPUS
Belval

bics.uni.lu

Programme

COURSES	ECTS
Semester 1	
Analysis for applications	5
Discrete mathematics	5
Introduction to project management	5
Linear algebra	5
Programming fundamentals	5
Web development	5
Total	**30**
Semester 2	
Bachelor semester project	10
Computing infrastructures	4
Linear algebra	4
Network and communication	4
Programming fundamentals	4
Smart ICT Technologies II	5
Theoretical computer science	4
Total	**30**
Semester 3	
Algorithms and complexity	4
Bachelor semester project	10
Discrete mathematics	4
Information management	4
Programming fundamentals	4
Statistics for Computer Scientists	4
Total	**30**
Semester 4	
Bachelor semester project	10
Information management	4
Intelligent systems	4
Programming fundamentals	4
Programming languages	4
Theoretical computer science	4
Total	**30**
Semester 5	
Bachelor semester project	10
Computational science	4
Human-computer interaction	4
Introduction to IOT	4
Natural language processing	4
Software engineering	4
Web development	4
Security	4
Introduction to Machine Learning	4
Total required	**30**
Semester 6	
Bachelor semester project	10
Formal methods	4
Intelligent systems	4
AI for Education	4
Security	4
Software engineering	4
User centered design	4
Total required	**30**

"I chose this Bachelor because of the international setting, high standards of scholarship, dynamic research and dedication to future lives of significance. I wanted to learn the fundamentals of the revolutionary aspect dominating our everyday lives. I really enjoyed the collaboration with researchers on various scientific and technical projects. This teamwork increases project management skills which are vital for business organisations."

Desislava Marinova, IBM

Bachelor in Applied Information Technology

180 ECTS

This Bachelor presents a dynamic and hands-on curriculum designed to equip students with practical skills essential for a seamless transition into the workforce upon graduation, whether in the public or private sector. This programme not only imparts fundamental skills but also instills a foundational knowledge base, laying the groundwork for ongoing education and sustained professional growth.

STRENGTHS

- Professional training
- Progressive specialisation
- One semester internship in a company

ADMISSION REQUIREMENTS (75 PLACES)

- Degree: Secondary school diploma
- Languages: B2 in English, B1 in French

STUDY & CAREER OPPORTUNITIES

- Master in Computer Science or related field
- Network administrator, IT developer, software engineer, webmaster in all business sectors

EXAMPLES OF ALUMNI CAREERS

- IT auditor, Arcelor
- Information security officer, Bâloise Luxembourg
- Software developer, NATO
- Business analyst, ARHS Consulting
- Software Engineer, SES

Programme at a glance

- Duration: 3 year full-time programme/ 6 semesters (180 ECTS)
- Languages: English (80%), French (20%)
- Registration fees: 400€/semester
- Available places: 75
- Application period:
  > For EU students: February-August
  > For non-EU students: February-April

Additional information

CONTACT
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CAMPUS
Belval

binfo.uni.lu

Programme

COURSES	ECTS
Semester 1	
Calculus	4
Introduction à l'informatique	4
Mathématiques discrètes	4
Operating systems	4
Programming	8
Statistiques	3
Technical English	3
Total	**30**
Semester 2	
Academic writing	3
Algorithms	4
Introduction to data analysis with Python	3
Introduction to graphics	4
Linear algebra	3
Mathématiques discrètes	3
Probabilités	3
Programming	5
Technical English	2
Total	**30**
Semester 3	
Algorithms	4
Databases	4
Droit pour informaticiens	3
Modelling with UML	3
Networks	4
Operating systems	4
Programming	4
Software engineering	4
Total	**30**
Semester 4	
Algorithms	4
Data science	4
Interaction design	4
Introduction à la vie professionnelle	3
Network	3
Psychologie du travail en groupe	5
Software engineering project	4
Software testing	4
Total required	**30**
Semester 5	
Backend software development	4
IT in a Real Financial Organization	4
Big data	4
Business software systems	4
Cloud-based applications	4
Design patterns	4
Distributed systems and middleware	4
Introduction à la vie professionnelle	2
Introduction to IOT	4
Introduction to IT security	4
Introduction to machine learning	4
Java for enterprise applications	4
Total required	**30**
Semester 6	
Bachelor project	27
Bachelor project defense	3
Total	**30**

Bachelor in Applied Information Technology

180 ECTS

Continuing Education Programme

This Bachelor offers a two-year programme for a continued professionalisation in IT that responds to the expectations of employers and employees who want to validate and reenforce their professional skills in the IT domain. The Bachelor is designed to conciliate professional life and learning with the organisation of evening courses during the week and individual or project-based learning activities.

STRENGTHS

- Learning of methods for the design and analysis of IT systems
- Mix of basic fundamental IT skills as well as competences in special areas
- Development of skills to independently adapt and extend their expertise

ADMISSION REQUIREMENTS (25 PLACES)

- Degree: Bac+2 with min. 3 years of experience or diploma of secondary school or technician diploma with min. 6 years of experience
- Languages: B2 in English and B1 in French

STUDY & CAREER OPPORTUNITIES

- Developer, IT analyst, administrator, web manager
- Master in Computer Science or related field

In collaboration with:

LUXEMBOURG LIFELONG LEARNING CENTRE
LA FORMATION CONTINUE DE LA CHAMBRE DES SALARIÉS

CHAMBRE DES SALARIÉS LUXEMBOURG

EXAMPLES OF ALUMNI CAREERS

- Technical consultant, Jiway
- Applied scientist, Amazon
- System architect, Police
- Advisor, PwC
- IT analyst, BGL BNP Paribas

Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters or 4 year part-time/ 8 semesters (120 ECTS)
- Languages: English (70%), French (30%)
- Registration fees: total 6500€
- Available places: 25
- Application period:
  > For EU students: February-August
  > For non-EU students: February-April

Additional information

CONTACT
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CAMPUS
Kirchberg

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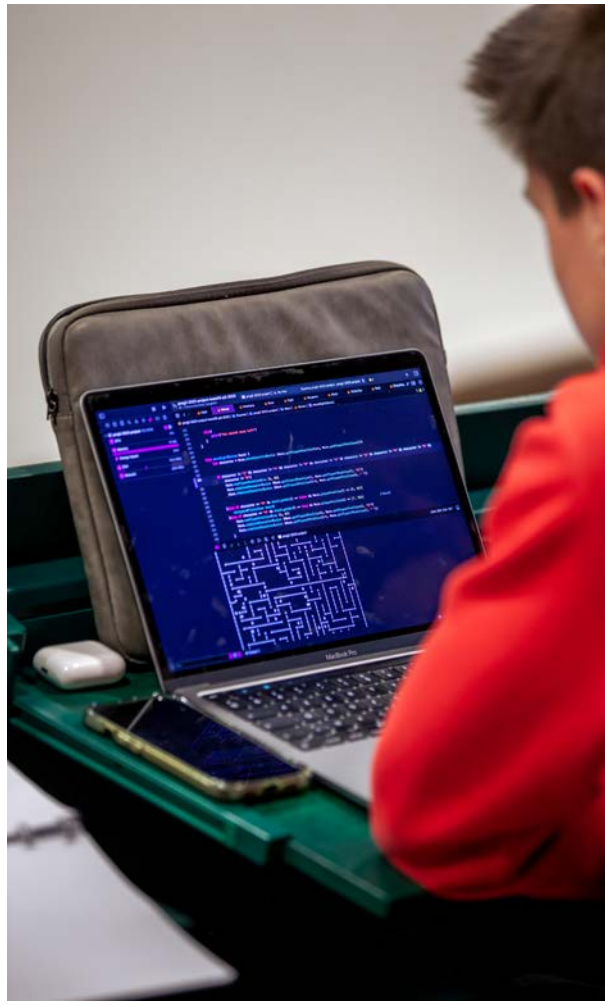
Programme

COURSES	ECTS
Semester 3	
Databases	6
Introduction to programming	6
Mathématiques générales	4
Réseaux informatiques	4
Total	**20**
Semester 4	
Algorithms and data structures	4
Analyse et conception des logiciels	6
Mathématiques discrètes	4
Operating systems	6
Total	**20**
Semester 5	
Algorithms and data structures	4
Analyse et conception des logiciels	6
GUI programming	4
Web programming	6
Total	**20**
Semester 6	
Blockchains	4
Java for enterprise applications	6
Mobile application development	6
Software testing	4
Total required	**20**



Master in Information and Computer Sciences

120 ECTS

This Master enables students to acquire deeper knowledge in computer science by understanding its abstract and interdisciplinary foundations, focusing on problem solving and developing lifelong learning skills.

STRENGTHS

- Flexible specialisation options
- Early involvement in research projects
- International cooperation agreements with universities and industries

ADMISSION REQUIREMENTS (40 PLACES)

- Degree: Bachelor in computer science or related field
- Language: B2 in English

STUDY & CAREER OPPORTUNITIES

- Data analyst, data scientist, software engineer, consultant, chief technology officer, IT specialist, teacher
- PhD in computer science

EXAMPLES OF ALUMNI CAREERS

- Data scientist, Goodyear
- IT application architect, Enovos
- Posdoctoral researcher, SnT
- Cloud Engineer
- Analyst developer, CTIE

Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters or 4 year part-time/ 8 semesters (120 ECTS)
- Language: English
- Registration fees: 400€/semester
- Available places: 40
- Application period:
  > For EU students: February-July
  > For non-EU students: February-April

Additional information

CONTACT
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CAMPUS
Belval

mics.uni.lu

Programme

COURSES	ECTS
Semester 1	
Algorithmic number theory	3
Communication theory	3
Distributed systems	3
Foundations of computing	3
Information security basics	3
Intelligent systems: agents and reasoning	3
Intelligent systems: machine learning	3
Intelligent systems: problem solving	3
Networking	3
Reliable software-intensive systems	3
Total required	**30**
Semester 2	
Algorithms for number and public-key cryptography	5
Big data analytics	5
Formal methods	5
Information theory and coding	5
Intelligent agents	5
Introduction to deep learning	5
Introduction to statics programme analysis	5
Introduction to information systems engineering	5
Microkernel based systems	5
Smart energy systems	5
Optimisation for computer science	5
Principles of security engineering	5
Principles of software development	5
Quality of service in computer networks	5
Symmetric key cryptography and security of communications	5
Software vulnerabilities: exploitation and mitigation	5
Total required	**30**
Semester 3	
Advanced project management	3
Autonomous robot software	4
Coding theory	4
Computer vision and image analysis	4
Connected and autonomous vehicles	4
Cryptocurrencies and the cryptographic blockchain	4
Fault and intrusion tolerance	4
Intellectual property	4
Intelligent agents	4
Machine learning	4
Model-driven software development	4
Open network security	4
Parallel and grid computing	4
Post-quantum crytography	4
Security modelling	4
Security protocols	4
Selected topics in AI	4
Selected topics in network and system security	4
Software engineering environments	4
Testing and validation	4
Total required	**30**
Semester 4	
Master thesis	30
Total	**30**

Master in Space Technologies and Business

120 ECTS

This collaborative Master programme is developed with the Luxembourg Space Agency, aiming to generate a talent pool of professionals able to answer the diverse needs of the booming commercial space industry. Growing innovations in space exploration and exploitation require professional figures able to manage the technical side, as well as the business side, of complex space missions and operations. It features technical and business lectures from experienced academic staff, as well as external experts from the commercial space industry.

STRENGTHS

- Interdisciplinary training
- Technology and business focused learning
- Problem-based learning approach using cutting-edge facilities

ADMISSION REQUIREMENTS (20 PLACES)

- Degree: Bachelor's degree in physics, mathematics, electrical, mechanical, or aerospace engineering (academic), computer science, or other natural science
- Language: B2 in English

STUDY & CAREER OPPORTUNITIES

- Engineer, researcher, project manager
- PhD in space engineering, telecommunications or informatics

In collaboration with:

SnT

LUXEMBOURG SPACE AGENCY

EXAMPLES OF ALUMNI CAREERS

- Market research analyst, Moonscape
- Partnership officer, LIST
- Air traffic safety electronic personnel, Administration of Air Navigation

Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters or 4 year part-time/ 8 semesters (120 ECTS)
- Language: English
- Registration fees: 2000€/semester
- Available places: 20
- Application period:
  > For EU students: February-August
  > For non-EU students: February-April

Additional information

CONTACT
mspace@uni.lu

CAMPUS
Kirchberg

mspace.uni.lu

Programme

COURSES	ECTS
Semester 1	
CubeSatLab / Design	2
Introduction to space robotics	5
Guidance, Navigation and Control for Space Systems	5
Programming for space engineers	3
Space informatics fundamentals	3
Space project management	4
Space resources fundamentals	3
Total	**30**
Semester 2	
CubeSat project	3
Introduction to AI for space	3
Planetary robotics	5
Satellite communications	5
Space business	5
Space economics	3
Space resource utilization technologies	3
Spacecraft design and subsystems engineering	3
Total	**30**
Semester 3	
Mandatory courses	
CubeSatLab / Build	3
Entrepreneurship	3
GNSS: theory and applications	3
Scientific space project	6
Electives	
Advanced satellite communication systems	3
CVIA (Computer vision and image analysis)	6
Practical aspects of entrepreneurship	3
Programming for Space Engineers	3
Quantum communication infrastructure fundamentals	3
Robotic manipulation in space1	3
Robotic manipulation in space2	3
Space Software Quality	3
Space, policy, law and ethics	3
Total required	**30**
Semester 4	
Master thesis	30
Total required	**30**

"The trainers were incredibly experienced and knowledgeable in their field of expertise. I also had the chance to learn from experienced members of the Luxembourg Space Agency and from space firms and start-ups who opened their doors to us and presented their R&D departments, both in theory and practically in their labs."

Lari Cujko,
Start-up Programme Lead, ESRIC

Master in High Performance Computing

120 ECTS

The Master in High Performance Computing (MHPC) is a unique program at the intersection of parallel programming, hardware architecture, computational science and artificial intelligence. High-performance computing (HPC) is an expanding and multi-disciplinary field aiming at programming and deploying algorithms for large parallel computers. The recent success stories of artificial intelligence such as protein folding (AlphaFold) and generative AI (ChatGPT) are backed by tremendous computational power. In the MHPC, you will learn to harness this power and develop skills in parallel computing. The cherry on the cake? HPC is a flagship of the Luxembourg economy, and thus strongly supported by labour market players.

STRENGTHS

- Outstanding knowledge from the best experts in HPC education in Europe
- Possibility of dual degree with partner universities
- Opportunity for internship in industry and supercomputing centres

In collaboration with:

EUMaster4HPC

ADMISSION REQUIREMENTS (40 PLACES)

- Degree: Bachelor in computer science or related field
- Knowledge of programming, data structures and algorithms
- Comprehensive training in technical mathematics
- Language: B2 in English

STUDY & CAREER OPPORTUNITIES

- HPC system engineer, parallel software developer, solution architect, HPC user support engineer, DevOps engineer, research support engineer
- PhD in computer science

Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters (120 ECTS)
- Language: English
- Registration fees: 400€/semester
- Available places: 40
- Application period:
  > For EU students: February-July
  > For non-EU students: February-April

Additional information

CONTACT
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CAMPUS
Belval

mhpc.uni.lu

University of Luxembourg | FSTM - Faculty of Science, Technology and Medicine | Computer science

Programme

COURSES	ECTS
Semester 1	
Distributed systems	3
Agents and reasoning	3
Machine learning	3
Problem solving	3
Introduction to HPC research	2
Networking	3
Parallel and grid computing	6
Philosophy and ethics of AI	4
Programming machine learning algorithms for HPC	3
Reliable software-intensive systems	3
Total required	**30**
Semester 2	
Big data analysis	5
High performance computer architecture	5
HPC algorithm design and verification with TLA+	5
HPC software environment	5
Introduction to deep-learning	5
Microkernel based systems	5
Principles of security engineering	5
Quality of service in computer networks	5
Total required	**30**
Semester 3	
Advanced project management	3
Computational science	4
Entrepreneurship	2
FPGA programming	3
Green IT	4
GPU programming	3
High performance data analytics and visualisation	5
Introduction to imaging AI with applications in medical imaging	5
Introduction to quantum mechanics, nanotechnologies and quantum algorithms	4
Lattice theory for parallel programming	3
Open network security	4
Podcasting: an introduction	2
Security of software defined networking	5
Selected topics in AI	4
Software engineering environments	4
Total required	**30**
Semester 4	
Master thesis	30
Total	**30**

Master in Cybersecurity and Cyber Defence

120 ECTS

The Master offers an interdisciplinary set of skills to prepare students in the emerging sectors of cybersecurity and cyber defence. It embraces subjects rooted in computer security but, more ambitiously, offers training in different and complementary academic disciplines to ensure a foundational understanding of information security as well as information security management and cyber defence operational skills. Through problem-based learning, students will build their capacity to evaluate, manage, and resolve critical issues, and will learn to communicate effectively with specialists and non-specialists alike.

STRENGTHS

- Interdisciplinary theoretical and practical training and education
- Innovative and foresighted programme
- Two profiles: research- and operation-oriented
- Compliant with the European Cybersecurity Skill Framework
- Strong connection with cybersecurity organisations

ADMISSION REQUIREMENTS (40 PLACES)

- Degree: Bachelor in computer science or related field. Bachelor in other sciences with knowledge informatics are also welcome.
- Language: B2 in English

STUDY & CAREER OPPORTUNITIES

- Cybersecurity system architect, engineer, tools operator and developer; CISO; intelligence and forensic analyst and auditor; cybersecurity risk and incident manager; policymaker
- PhD/research career in cybersecurity and cyber defence

In collaboration with:

SnT

THE GOVERNMENT OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of Foreign and European Affairs

Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters (120 ECTS)
- Language: English
- Registration fees: 400€/semester
- Available places: 40
- Application period:
  > For EU students: February-July
  > For non-EU students: February-April

Additional information

CONTACT
mcysd@uni.lu

CAMPUS
Belval

mcysd.uni.lu

Programme

COURSES	ECTS
Semester 1	
AI and cybersecurity	5
Information security basics	5
Security modelling	5
Security protocols	5
Software vulnerabilities	5
Structural analysis techniques and methods	5
Total	**30**
Semester 2	
Algorithms for number and public key cryptography	5
Catch the flag / Cyber range	1
Communicating science	3
Cyberpolicies	3
Cybersecurity and cyber defence history	1
Cybersecurity foresight methods	1
Cybersecurity threats and forensics	1
Data science in R (data visualization)	3
Incident simulation	1
Introduction to cyber defence	3
Introduction to static programme analysis	5
Microkernel systems and mycrohypervisor-based systems	5
Mobile security	4
Principles of security engineering	5
Reporting and communication	1
Symmetric key cryptography and security of communications	5
Total required	**30**
Semester 3	
Advanced project management	3
Algorithmic number theory	3
Cybersecurity tools	1
Digital ethics	1
Digital wallets	5
EU digital sovereignty	5
EU regulatory framework	1
Fault and intrusion tolerant systems	4
Humans aspects in cybersecurity	3
Incident response practices	1
Information security management systems	2
Information theory and cyber risks	3
Log analysis	3
Modelling and simulation of complex systems	3
Open network security	4
Philosophy and ethics in AI	4
Post-quantum crytography	4
Practical aspects in entrepreneurship	3
Quantum communication and quantum key distribution	3
Resilient computing	5
Serious game in cybersecurity	1
Static and dynamic software security analysis	5
Usability in cybersecurity	1
Wireless network security	3
Total required	**30**
Semester 4	
Master thesis (topic selected from the 3rd semester)	30
Total required	**30**

Erasmus Mundus Joint Master in Cybersecurity

120 ECTS

This Master enables students to acquire very good knowledge in cybersecurity by designing and developing secure products and security architectures; testing the resistance of software, products and embedded systems to the latest cyberthreats. Students have the opportunity to specialise in IoT or software cybersecurity and develop their skills via an internship in the field of cybersecurity.

STRENGTHS

- Double degree
- 2 specialisations: IoT cybersecurity (Université Libre de Bruxelles) or software cybersecurity (University of Luxembourg)
- Internship in industry or similar

ADMISSION REQUIREMENTS (32 PLACES)

- Degree: Bachelor in computer science or related field with 3 years of experience or a Master in a related field
- Language: B2 in English

STUDY & CAREER OPPORTUNITIES

- Cybersecurity engineer, cybersecurity analyst, security architect, security product integrator, software developer, cryptographer, malware analyst, application security expert
- PhD in computer science

In collaboration with:

Université Bretagne Sud – ubs

ULB UNIVERSITÉ LIBRE DE BRUXELLES

Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters (120 ECTS)
- Language: English
- Registration fees: 4500€/year
- Available places: 32
- Application period: until February

Additional information

CONTACT
cyberus@uni.lu

CAMPUS
Belval

cyberus.uni.lu

Programme

COURSES	ECTS
Semester 1 (Université de Bretagne Sud)	
Cryptology	5
EU digital sovereignty: cyberthreats to the EU and cyberactors	5
Risk analysis and introduction to security by design	5
Secure advanced programming	5
Soft skills	5
Statistical foundations for cybersecurity	5
Total	**30**

Semester 2 (Université de Bretagne Sud)	
EU digital sovereignty: EU cyberstrategy and policy	5
Hardware security and side channels attacks / compiler construction	5
Network and operating systems security	5
Pentesting	5
Practical	5
Soft skills	5
Total	**30**

Semester 3: Software cybersecurity (University of Luxembourg)	
Cybersecurity and AI	5
Communication software security	5
EU digital sovereignty: securing EU digital sovereignty through research and innovation	5
Resilient computing	5
Security of databases and digital wallets	5
Soft skills and practical	5
Static and dynamic software security analysis	5
Total required	**30**

Semester 4	
Internship and Master thesis in cybersecurity	30
Total	**30**

Master in Information System Security Management

60 ECTS

This Master allows professionals to increase their knowledge and develop their skills to analyse, interpret and provide adequate solutions in the field of information security.

STRENGTHS

- Multidisciplinary approach promoting knowledge sharing and exchange of experiences
- Participation in the Information Security Education Day (ISED)
- Programme supported by two professional associations: Club de la Sécurité de l'Information (CLUSIL) and Women Cyber Force (WCF)

ADMISSION REQUIREMENTS (18 PLACES)

- Degree: Bachelor in computer science or related field with 3 years of experience or a Master in a related field
- Language: B2 in English

CAREER OPPORTUNITIES

Information security manager

In collaboration with:

LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY | LIST

EXAMPLES OF ALUMNI CAREERS

- Cyber security manager, Banque Raiffeisen
- Information security expert, Lombard
- Security Engineer, Telindus
- Information security officer, European Court of Auditors

Programme at a glance

- Duration: 2 year part-time programme/ 4 semesters (60 ECTS)
- Language: English
- Registration fees: 1800€/semester
- Available places: 18
- Application period: February-June

Additional information

CONTACT
missm@uni.lu

CAMPUS
Belval

missm.uni.lu

Programme

COURSES	ECTS
Semester 1	
Analysis and risk management	2
Information security management systems	2
Legal and regulatory aspects	3
Risk analysis practises	1
Security technologies	2
Working in Information Security Management	1
Theory of organisations and change	2
Total	**13**
Semester 2	
Communication, processing and persistence of information	2
Enforcement of legal provisions	2
Enterprise architecture and strategy	3
Financial management	1
IT management	1
Security technologies	2
Special Businesses and Impacts	2
Total	**13**
Semester 3	
Communication, processing and persistence of information	4
Compliance Assurance	2
Human risks	2
Project management	2
Security policy	2
Threats, attacks and parries	2
Total	**14**
Semester 4	
Continuing management	1
Security Emerging Technologies	3
Human communication	2
Professional project	14
Total	**20**

"This Master immediately appealed to me because it offers an unusual mix of skills in the three main information security topics, namely management, techniques, and most of all, the human aspects. Working at the heart of local market issues within a relational framework is very rewarding. Even today, it remains a source of inspiration for me. Finally, this Master is an ideal place to meet other professionals. An experience to be lived and full of meaning."

Raphaël Taban,
Data Protection Officer, CTIE

Master in Technopreneurship

60 ECTS

This Master programme is highly innovative, offering a dual benefit. On one hand, it equips students with foundational knowledge on current and emerging topics in smart ICT, keeping pace with the latest technical, business and legal advancements. On the other hand, it acts as a driver of growth in the ICT industry by providing practical examples and case studies that showcase the role of technical standardization as a means to establish a common technical language, build trust, and enhance efficiency in smart ICT.

STRENGTHS

- Innovative approach with practical examples and case studies
- Wide range of topics from smart ICT technologies to digital trust aspects
- Programme supported by the Ministry of the Economy, the European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC), as well as the European Telecommunications Standards Institute (ETSI)

ADMISSION REQUIREMENTS (20 PLACES)

- Degree: Bachelor in computer science or related field with 3 years of experience or a Master in a related field
- Language: B2 in English

CAREER OPPORTUNITIES

Technology officer, emerging technologies consultant, digital strategy consultant, smart ICT consultant, innovation manager, standards manager, project manager, head of innovation, head of digital strategy, and technopreneur

In collaboration with:

ILNAS

LUXEMBOURG LIFELONG LEARNING CENTRE
LA FORMATION CONTINUE DE LA CHAMBRE DES SALARIÉS

CHAMBRE DES SALARIÉS LUXEMBOURG

Programme at a glance

- Duration: 2 year part-time programme/ 4 semesters (60 ECTS)
- Language: English
- Registration fees: total 6400€
- Available places: 20
- Application period:February-June

Intake periods occur every two years.
The next intake will be for
the 2026-2027 academic year.

Additional information

CONTACT
mtech@uni.lu

CAMPUS
Luxembourg and Belval

mtech.uni.lu

Programme

COURSES	ECTS
Semester 1	
Smart secure ICT and innovation	1
Smart ICT technologies	5
Technical standardisation	3
Total	**9**
Semester 2	
Security for smart ICT	5
Smart ICT technologies	5
Total	**10**
Semester 3	
Digital intelligence	2
Legal aspects	2
Management of business and technical innovation	3
Trust architectures for smart ICT	4
Total	**11**
Semester 4	
Master thesis	30
Total	**30**

"I wanted to update myself with the latest developments in technology, digital trust including an entrepreneurial perspective.
I liked the mix of academic and business experience of the lecturers. It helped me not only to reflect on how to deliver the finance transformation
but also to create the foundation for building the business case, the change management approach and the governance."

Joao Seixas Marques,
Vice-President Finance Transformation, RTL Group

Doctoral Programme in Computer Science and Computer Engineering

This programme provides an excellent environment for pursuing doctoral studies in computer science and computer engineering at an internationally competitive level and in broad interdisciplinary application.

STRENGTHS

- Personal supervision by internationally leading scientists
- Immediate integration into research groups and projects
- Broad offer to transferable skills training

ADMISSION REQUIREMENTS

- Degree: Master in computer science or related field
- Language: B2 in English

CAREER OPPORTUNITIES

- Postdoctoral researcher, research scientist, research associate, associate professor
- Software engineer, data scientist, IT consultant, IT manager, product developer

In collaboration with:

SnT

EXAMPLES OF ALUMNI CAREERS

- Assistant professor, University of Twente
- Cyber security engineer, SES Satellites
- Engineering manager, Netflix
- Postdoctoral fellow, University of Ottawa

Programme at a glance

- Duration: 3 to 4 years
- Language: English
- Registration fees: 400€/semester
- Number of doctoral candidates: 240

Additional information

CONTACT
csce@uni.lu

CAMPUS
Belval

csce.uni.lu

Our department
Computer Science

DCS at a glance

The Department of Computer Science (DCS) conducts fundamental and applied research in artificial intelligence, security, and advanced computing systems like high-performance computing (HPC), thereby contributing to digital transformation. The Department collaborates on joint interdisciplinary research projects with departments, faculties and centres at the University. Additionally, it maintains extensive research partnerships with leading institutions like the University of Oxford, ETH Zurich, and CNRS.

MEMBERS

- 22 professors
- 44 post-docs and research scientists
- 39 doctoral candidates
- 14 technical and administrative staff

FUNDING AND COLLABORATIONS

Nearly €8 million acquired through national and international competitive grants, such as

- ERC Advanced Grant CLOUDMAP
- EU H2020 ChronoPilot and BANANA
- EIC Pathfinder SYMBIOTIK

PUBLICATIONS (2023)

- 46 peer-reviewed articles in scientific journals
- 110 conference papers

Additional information

CONTACT
dcs@uni.lu

CAMPUS
Belval

dcs.uni.lu

Research areas

The department (DCS) carries out research activities around three thematic axes:

ADVANCED COMPUTING SYSTEMS

In Advanced Computing Systems, we push the boundaries of system modeling, reliability, and scalability. Our research spans robust computing infrastructures, quantum computing integration, and high-performance computing. A major focus is on optimiSing performance and energy efficiency while addressing challenges like fault tolerance in ultra-scale systems.

ARTIFICIAL INTELLIGENCE

In AI, our focus lies on exploring the theoretical foundations and developing advanced algorithms for machine learning and intelligent systems. This includes research on sparse neural networks, logic frameworks, computational interactions, cognitive robotics and legal informatics. In addition to the three core research areas, DCS created in 2023 the cross-cutting focus area "AI4EDU" to explore the potentials of AI in education, serve as a platform for interdisciplinary research and foster outreach in the field of AI literacy.

INFORMATION SECURITY

In Information Security, we conduct research in cryptography, system security, and secure implementations. Our work ranges from creating novel cryptographic primitives to defending against side-channel attacks.

discover the

Studying
at our University
**Young, dynamic
and international**

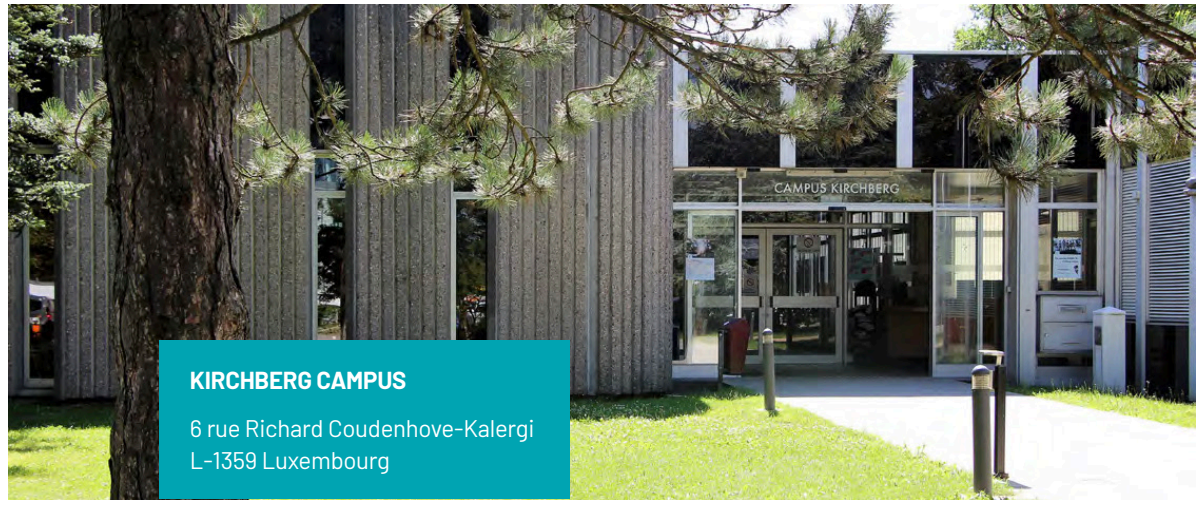
UNIVERSITY OF LUXEMBOURG

With more than 6,200 students from all over the world, the University of Luxembourg has an international and multilingual character that offers its students a higher research-oriented education.

Three campus sites

BELVAL CAMPUS

2, place de l'Université
L-4365 Esch-sur-Alzette

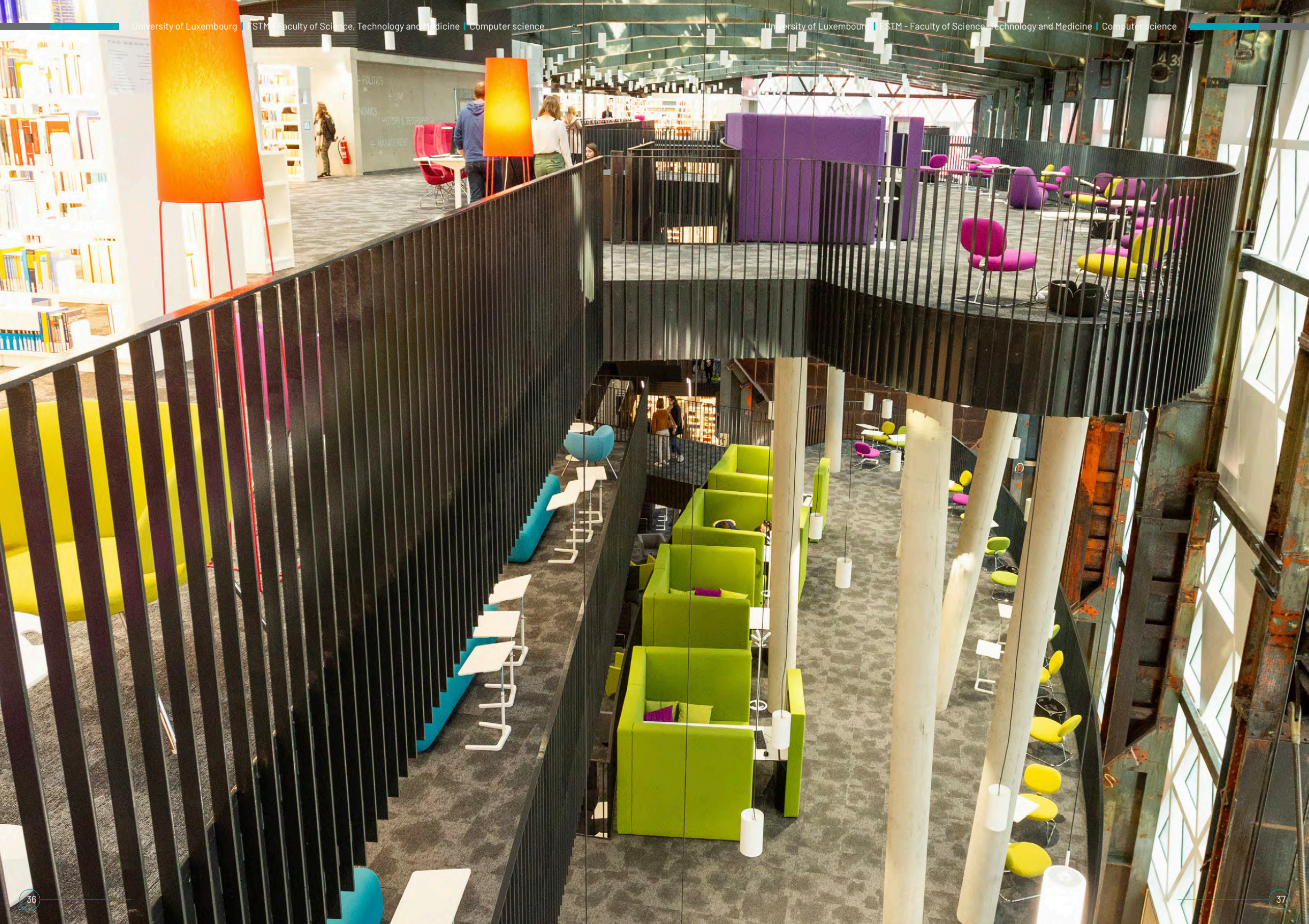


KIRCHBERG CAMPUS

6 rue Richard Coudenhove-Kalergi
L-1359 Luxembourg

LIMPERTSBERG CAMPUS

162 A avenue de la Faïencerie
L-1511 Luxembourg



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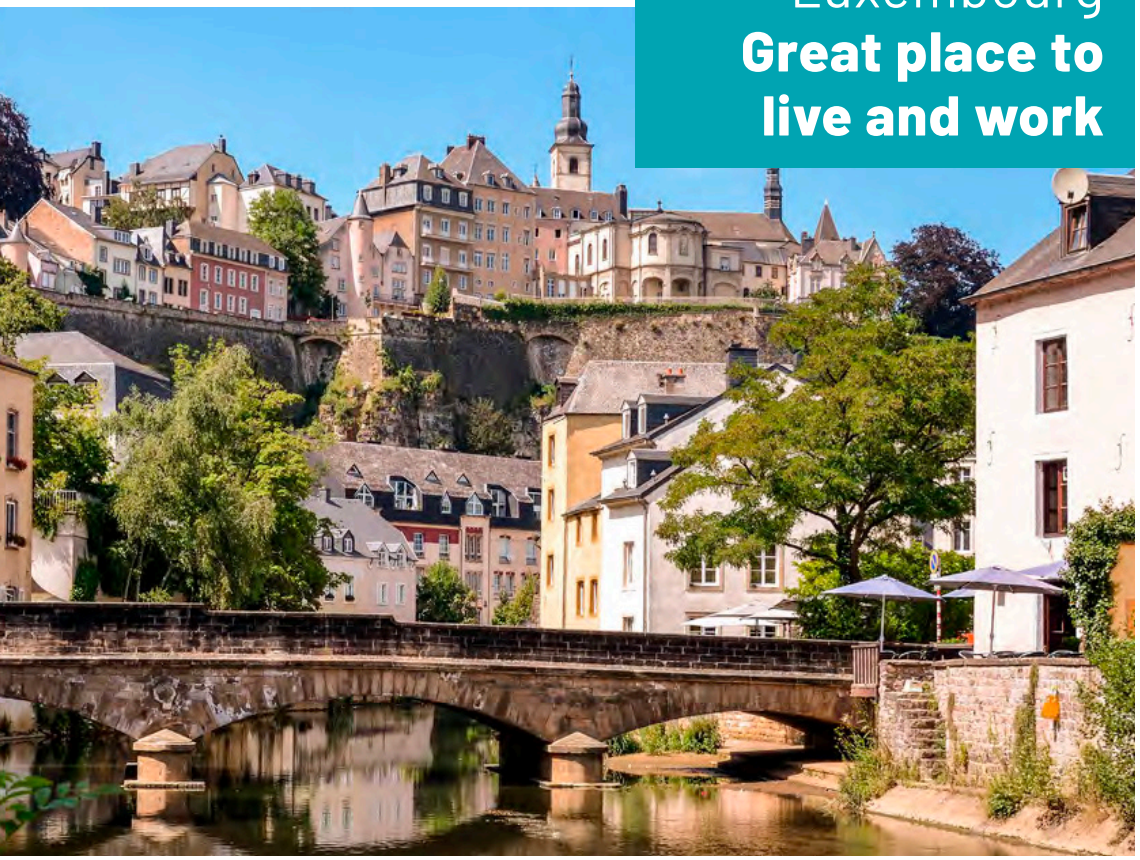

Located in the heart of Europe, the Grand Duchy of Luxembourg boasts a colourful history, stunning landscape, multicultural environment and multilingual population. The thousand year old capital and five regions each have their own unique flavour and discoveries to be made. Experience contemporary and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

Contact

University of Luxembourg
Faculty of Science, Technology
and Medicine (FSTM)
fstm.uni.lu

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2, place de l'Université
L-4365 Esch-sur-Alzette

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03-2025

Stay in touch

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