

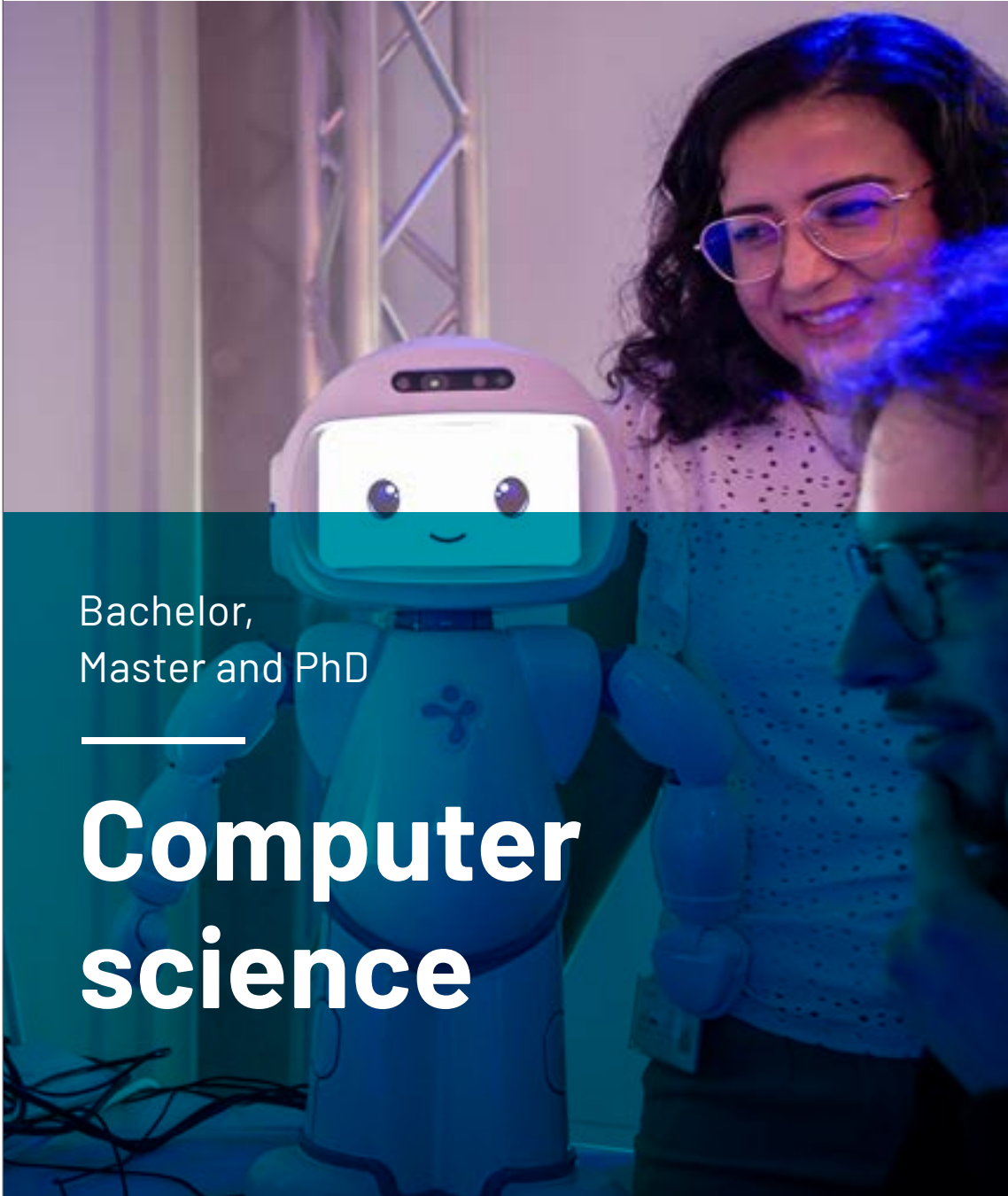


FACULTY OF SCIENCE,  
TECHNOLOGY AND  
MEDICINE

Bachelor,  
Master and PhD

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# 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 Medicine.

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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.



**5**  
Disciplines

**39**  
Study programmes

**3**  
Official languages



**1**  
Faculty

**5**  
Departments

**3**  
Campus sites



**2000**  
Students

**130**  
Countries

**56 %**  
International students





## Why study Computer Science?

### Booming ICT sector: Luxembourg waits for you!

#### DIGITAL PIONEER

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.).

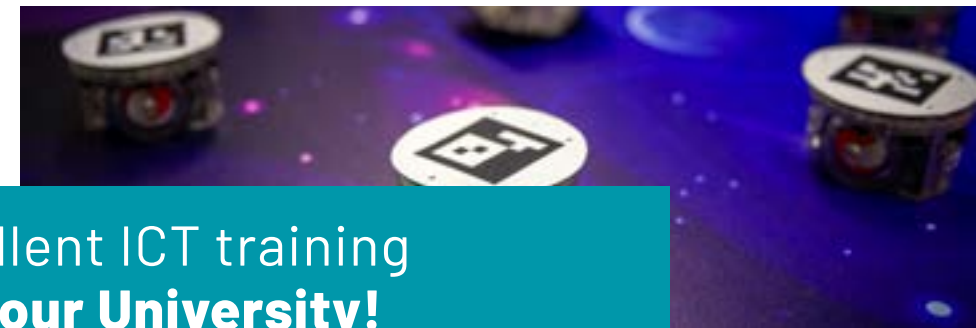
### Crucial need of ICT staff: get a Bachelor or more!

The country's share of ICT specialists and graduates is higher than the EU average, but there is still a shortage of ICT specialists<sup>1</sup>. 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<sup>2</sup>.

<sup>1</sup> Source : Digital Economy and Society Index (DESI), 2022

<sup>2</sup> Source: Report : « ICT: Jobs with a future! », 2022

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<sup>2</sup>.



## 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



**Bachelor in  
Computer Science**

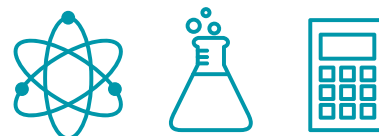
180 ECTS

**Bachelor in  
Applied Information  
Technology**

180 ECTS

**Bachelor in Applied  
Information Technology –  
Continuing Education  
Programme**

180 ECTS



**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

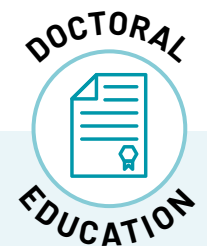


**Master in Information  
System Security Management**

60 ECTS

**Master in  
Technopreneurship**

60 ECTS



**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 (70 PLACES)

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

## STUDY OPPORTUNITIES

- Master in Computer Science or related field



## EXAMPLES OF ALUMNI CAREERS

- Consultant, Deloitte
- Network architect, CTIE
- Developer, POST
- Teacher, Lycée des Arts et Métiers
- Software Engineer, consultant, Talkwalker

## Programme at a glance

- Duration: 3 year full-time programme/ 6 semesters (180 ECTS)
- Language: English
- Registration fees: 400€/semester (1 & 2)+ 200€/semester (3 to 6)
- Available places: 70
- Application period:
  - > For EU students: February-July
  - > For non-EU students: February-April

## Additional information

**CONTACT**  
bics@uni.lu

**CAMPUS**  
Belval



● [bics.uni.lu](http://bics.uni.lu)

## Programme

COURSES	ECTS
<b>Semester 1</b>	
Analysis for applications	5
Discrete mathematics	5
Introduction to project management	5
Linear algebra	5
Programming fundamentals	5
Web development	5
<b>Total</b>	<b>30</b>
<b>Semester 2</b>	
Bachelor semester project	10
Computing infrastructures	4
Linear algebra	4
Network and communication	4
Programming fundamentals	4
Theoretical computer science	4
<b>Total</b>	<b>30</b>
<b>Semester 3</b>	
Algorithms and complexity	4
Bachelor semester project	10
Discrete mathematics	4
Information management	4
Programming fundamentals	4
Security	4
<b>Total</b>	<b>30</b>
<b>Semester 4</b>	
Bachelor semester project	10
Information management	4
Intelligent systems	4
Programming fundamentals	4
Programming languages	4
Theoretical computer science	4
<b>Total</b>	<b>30</b>
<b>Semester 5</b>	
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
<b>Total required</b>	<b>30</b>
<b>Semester 6</b>	
Bachelor semester project	10
Formal methods	4
Intelligent systems	4
Computational science	4
Data science for humanities	4
Security	4
Software engineering	4
User centered design	4
<b>Total required</b>	<b>30</b>

“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, Baloise 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 (1 & 2) + 200€/semester (3 to 6)
- Available places: 75
- Application period:
  - > For EU students: February-August
  - > For non-EU students: February-April

## Additional information

### CONTACT

binfo@uni.lu

### CAMPUS

Belval

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

## Programme

COURSES	ECTS
<b>Semester 1</b>	
Calculus	4
Introduction à l'informatique	4
Mathématiques discrètes	4
Operating systems	4
Programming	8
Statistiques	3
Technical English	3
<b>Total</b>	<b>30</b>

<b>Semester 2</b>	
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
<b>Total</b>	<b>30</b>

<b>Semester 3</b>	
Algorithms	4
Databases	4
Droit pour informaticiens	3
Modelling with UML	3
Networks	4
Operating systems	4
Programming	4
Software engineering	4
<b>Total</b>	<b>30</b>

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

<b>Semester 5</b>	
Backend software development	4
Banking information technologies	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
<b>Total required</b>	<b>30</b>

<b>Semester 6</b>	
Bachelor project	27
Bachelor project defense	3
<b>Total</b>	<b>30</b>

# 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 reinforce 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

binfo-cep@uni.lu

#### CAMPUS

Kirchberg



● [binfo-cep.uni.lu](http://binfo-cep.uni.lu)

## 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

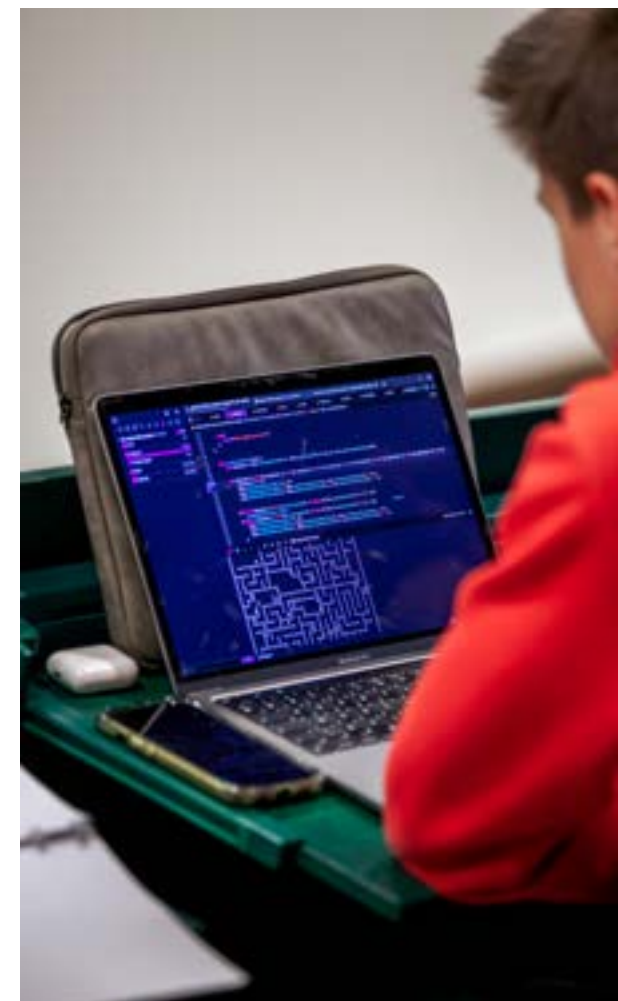
Algorithms and data structures	4
Analyse et conception des logiciels	6
GUI programming	4
Web programming	6

**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
- Postdoctoral 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: 200€/semester
- Available places: 40
- Application period:
  - > For EU students: February-July
  - > For non-EU students: February-April

## Additional information

### CONTACT

mics@uni.lu

### 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 cryptography	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
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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:



## 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
<b>Semester 1</b>	
CubeSatLab / Design	2
Introduction to space robotics	5
Programming for space engineers	3
Satellite communications & security	5
Space informatics fundamentals	3
Space project management	4
Space resources fundamentals	3
Spacecraft subsystem design and engineering	5
<b>Total</b>	<b>30</b>
<b>Semester 2</b>	
CubeSat project	3
GNCSS (Guidance, navigation and control for space systems)	5
Introduction to AI for space	3
Planetary robotics	5
Space business	5
Space economics	3
Space resource utilization technologies	3
Spacecraft design and subsystems engineering	3
<b>Total</b>	<b>30</b>

<b>Semester 3</b>	
CubeSatLab / Build	3
Entrepreneurship	3
GNSS: theory and applications	3
Scientific space project	6
<i>Electives</i>	
Advanced satellite communication systems	3
CVIA (Computer vision and image analysis)	6
Practical aspects of entrepreneurship	3
Quantum communication infrastructure fundamentals	3
Robotic manipulation in space	3
Software testing	3
Space, policy, law and ethics	3
<b>Total required</b>	<b>30</b>

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

“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

This Master trains the next generation of HPC experts in Luxembourg and Europe. Students acquire a solid education in mathematical modelling and algorithms, software engineering, parallel programming and parallel architecture. They gain a cutting-edge knowledge in high performance computing, high performance data analytics and artificial intelligence as well as soft skills. Given that HPC is a flagship of the Luxembourg economy, this Master's programme is strongly supported by labour market players.

## STRENGTHS

- Innovative teaching paradigms and academic excellence
- 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

## 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

- Engineer, researcher, manager, consultant
- PhD in computer science

In collaboration with:



## Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters (120 ECTS)
- Language: English
- Registration fees: 200€/semester
- Available places: 40
- Application period:
  - > For EU students: February-July
  - > For non-EU students: February-April

## Additional information

### CONTACT

mhpc@uni.lu

### CAMPUS

Belval



mhpc.uni.lu

## Programme

### COURSES

ECTS

#### Semester 1

Distributed systems	3
GPU programming	3
Intelligent systems - agents and reasoning	3
Intelligent systems - machine learning	3
Intelligent systems - Problem solving	3
Introduction to HPC research	3
Newtorking	3
NoSQL datasabes and cloud computing	4
Parallel and grid computing	4
Philosophy and ethics of AI	4

**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
High performance data analytics and visualisation	5
Introduction to imaging AI with applications in medical imaging	5
Introduction to quantum computing	3
Lattice theory for parallel programming	3
Open network security	4
Podcasting: an introduction	2
Programming machine learning algorithms for HPC	4
Security of software defined networking	5
Selected topics in AI	4
Software engineering environments	4

**Total required 30**

#### Semester 4

Master thesis	30
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**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:



## Programme at a glance

- Duration: 2 year full-time programme/ 4 semesters (120 ECTS)
- Language: English
- Registration fees: 200€/semester
- Available places: 40
- Application period:
  - > For EU students: February-July
  - > For non-EU students: February-April

## Additional information

### CONTACT

mcyasd@uni.lu

### CAMPUS

Belval



mcyasd.uni.lu

## Programme

COURSES	ECTS
<b>Semester 1</b>	
AI and cybersecurity	5
Information security basics	5
Security modelling	5
Security protocols	5
Software vulnerabilities	5
Structural analysis techniques and methods	5
<b>Total</b>	<b>30</b>
<b>Semester 2</b>	
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
<b>Total required</b>	<b>30</b>

## 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 cryptography	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
<b>Total required</b>	<b>30</b>

## Semester 4

Master thesis (topic selected from the 3 <sup>rd</sup> semester)	30
<b>Total required</b>	<b>30</b>

# 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:



## 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](https://cyberus.uni.lu)

## Programme

COURSES	ECTS
<b>Semester 1 (Université de Bretagne Sud)</b>	
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
<b>Total</b>	<b>30</b>
<b>Semester 2 (Université de Bretagne Sud)</b>	
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
<b>Total</b>	<b>30</b>
<b>Semester 3: Software cybersecurity (University of Luxembourg)</b>	
Cybersecurity and AI	5
Communication software security	5
EU digital sovereignty: securing 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
<b>Total required</b>	<b>30</b>
<b>Semester 4</b>	
Internship and Master thesis in cybersecurity	30
<b>Total</b>	<b>30</b>

# 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 (15 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:



## 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: 15
- Application period:
  - > For EU students: February-July
  - > For non-EU students: February-April

## Additional information

### CONTACT

missm@uni.lu

### CAMPUS

Belval



[missm.uni.lu](https://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
The job of information security manager	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
Specificities of financial sector	2

**Total** 13

#### Semester 3

Communication, processing and persistence of information	4
Compliance insurance	2
Human risks	2
Project management	2
Security policy	2
Threats, attacks and parries	2

**Total** 14

#### Semester 4

Continuing management	1
Digital archiving	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 is extremely innovative. On the one hand, it provides students with a base of knowledge on topics reflecting current issues and those at the cutting edge of smart ICT, and on the other hand, it serves as a catalyst for growth in the ICT industry by offering practical examples and case studies illustrating the use of technical standardisation as a tool to give common technical language, build trust, and foster effectiveness 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 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:




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LA FORMATION CONTINUE DE LA CHAMBRE DES SALARIÉS



CHAMBRE DES SALARIÉS  
LUXEMBOURG

## Programme

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



## 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:
  - > For EU students: February-June
  - > For non-EU students: February-April

## Additional information

### CONTACT

mtech@uni.lu

### CAMPUS

Luxembourg and Belval


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

“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:



## 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: 200€/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 the area of computer, communication and information sciences. The goal is to push forward the scientific frontiers of these fields in close collaboration with the Interdisciplinary Centre for Security, Reliability and Trust (SnT). In addition, the Department is in charge of several bachelors, Masters and doctoral programmes in computer science.

#### MEMBERS

- 21 professors
- 50 post-docs and research scientists
- 34 doctoral candidates
- 17 technical and administrative staff

#### FUNDING AND COLLABORATIONS



#### PUBLICATIONS (2022)

- 77 peer-reviewed articles in scientific journals
- 134 conference papers

### Additional information

#### CONTACT

dcs@uni.lu

#### CAMPUS

Belval



● [dcs.uni.lu](https://dcs.uni.lu)



## Research areas

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

#### COMMUNICATIVE SYSTEMS

Research focuses on information transfer and communicating systems. Studies related to information transmission over potentially complex channels and networks are combined with investigations of multiple distributed entities employing communication networks to collaboratively achieve a common goal.

#### INFORMATION SECURITY

Computer scientists investigate methods and tools relevant to cryptography and information security. They study various topics such as security protocols, network, mobile and embedded systems security, privacy and anonymity, cloud computing, AI security, security and privacy in machine learning.

#### INTELLIGENT AND ADAPTATIVE SYSTEMS

Researchers investigate the theoretical foundations and the algorithmic realisation of information processing and reasoning in complex and dynamic environments given limited resources and incomplete or uncertain information. They work on intelligent agents, computational intelligence and applied logic.

#### SOFTWARE AND SYSTEMS

Scientists investigate methods and tools to master the development of complex software systems. They focus on the development of new engineering processes and e-learning tools ; they investigate model-driven development, software engineering and verify and validate techniques. The main application domains are industry-critical systems, e-learning systems, web-based distributed systems, and enterprise architectures.



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## 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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## Contact

### University of Luxembourg

Faculty of Science, Technology  
and Medicine (FSTM)

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

### Campus Belval

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L-4365 Esch-sur-Alzette

### Campus Kirchberg

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L-1359 Luxembourg

### Campus Limpertsberg

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