Master of Computer Science:

Computer Networks, Data Science and Artificial Intelligence, or Software Engineering

2024-2025

University of Antwerp

Let's shape the future

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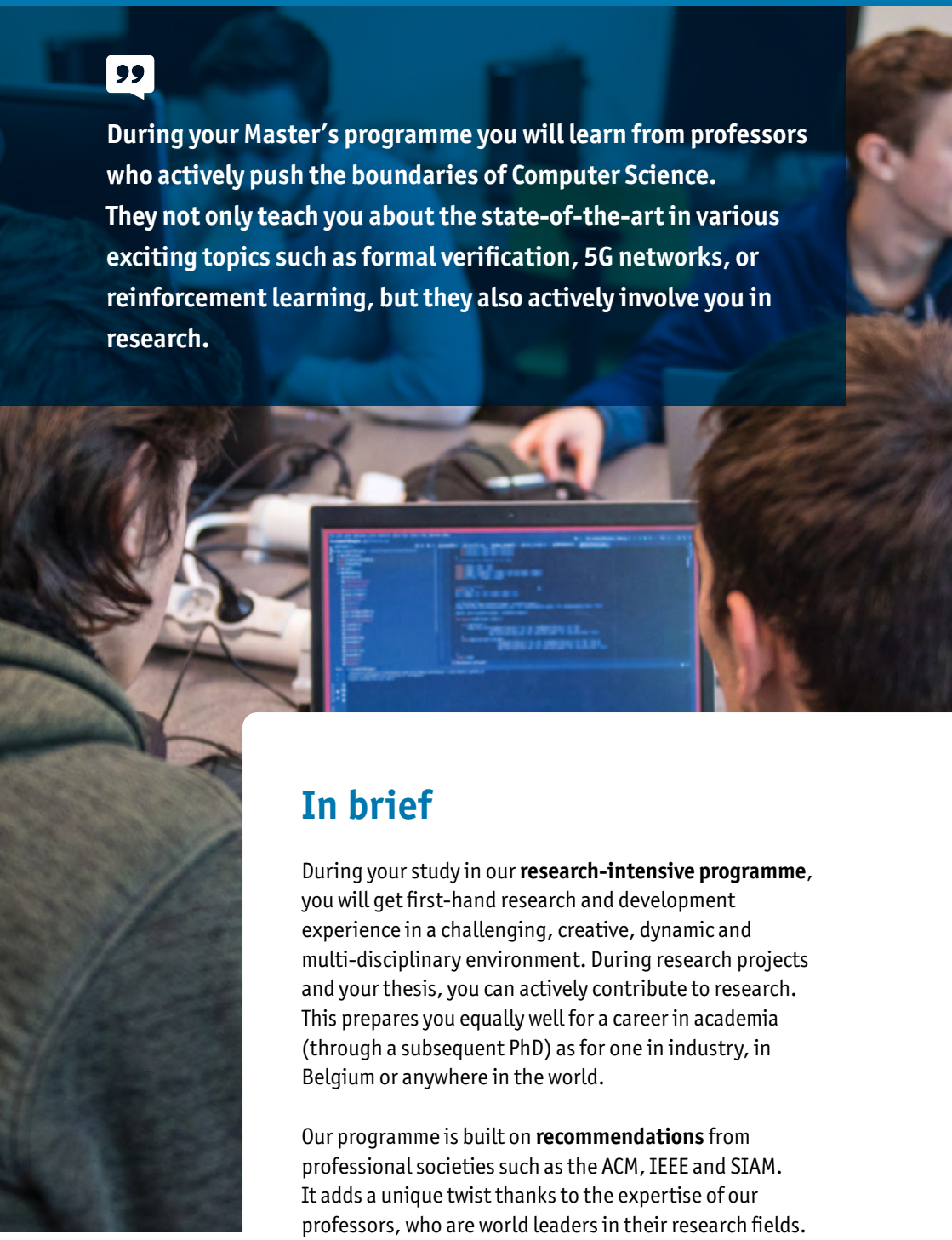


During your Master's programme you will learn from professors who actively push the boundaries of Computer Science. They not only teach you about the state-of-the-art in various exciting topics such as formal verification, 5G networks, or reinforcement learning, but they also actively involve you in research.

In brief

During your study in our **research-intensive programme**, you will get first-hand research and development experience in a challenging, creative, dynamic and multi-disciplinary environment. During research projects and your thesis, you can actively contribute to research. This prepares you equally well for a career in academia (through a subsequent PhD) as for one in industry, in Belgium or anywhere in the world.

Our programme is built on **recommendations** from professional societies such as the ACM, IEEE and SIAM. It adds a unique twist thanks to the expertise of our professors, who are world leaders in their research fields.

In detail

This 120 ECTS credits programme has **three majors**:
Computer Networks, Data Science and Artificial Intelligence, and Software Engineering. You choose your major when applying for admission to the programme.
The programme focuses on research and development.

The two years are made up of **four blocks**:

1. Compulsory core courses
2. Elective courses (can be outside your major)
3. Two compulsory research projects
4. Compulsory Master's thesis

The Master's programme culminates in the Master's thesis. The aim of this thesis is for you to show that you are able to independently explore (under supervision of a promoter) a complex subject in a scientific manner and write down the acquired insights in a coherent scientific text.

Practice in your programme
A computer scientist with academic training should be capable of applying the knowledge and skills acquired throughout the programme to concrete problems. Consequently there is ample room for practical work and - not surprisingly - group work. Independence and maturity are strengths of our programme.

After obtaining the degree **you will be able to:**

- Apply **new scientific** and **technological** developments in Computer Science to various domains
- Make **original contributions** to the further development of the discipline (when required)

Programme structure

Curriculum

Compulsory courses

For major Computer Networks **ECTS credits 36**

Advanced wireless and 5G Networks	6
Data Mining	6
Future Internet	6
Introduction to Performance Modelling	6
Modelling of Software-intensive Systems	6
Reinforcement Learning	6

For major Data Science and Artificial Intelligence **ECTS credits 30**

Database systems	6
Data Mining	6
Intormation Retrieval	6
Modelling of Software-intensive Systems	6
Reinforcement Learning	6

For major Software Engineering **ECTS credits 30**

Data Mining	6
Modelling of Software-intensive Systems	6
Model-driven Engineering	6
Reinforcement Learning	6
Software Reengineering	6

Master's thesis **ECTS credits 30**
Same for 3 majors
(Supervisor or co-supervisor is associated with the specific major)

Research Skills Development **ECTS credits 18**
Same for 3 majors

└ Research project 1 18

Elective courses
36 ECTS credits for Computer Networks, and 42 ECTS credits for Data Science and Artificial Intelligence and Sofware Engineering to be chosen from the major specific list of electives (Please consult the course catalogue on www.uantwerpen.be/computer-science)

Total **ECTS credits 120**

Job opportunities

The choice is yours ...

With a degree in Computer Science a multitude of job opportunities and interesting career perspectives await you. It will be much less a matter of whether you will find a job, but more of which job you will choose that most closely matches your interests.

All major challenges in science and technology in the current century are multidisciplinary in nature: i.e. several disciplines must come together to create a context for radically new solutions. **Computer scientists play a pivotal role**: they collect and organise information (data and models) to ensure that the numerous software systems, networks, algorithms can inter-operate seamlessly. For instance at the CERN lab, computer scientists mediate between physicists and engineers. Similarly, in the human genome project, computer scientists ensure that doctors and biochemists can exchange the complex information encoded in DNA. The modern economy with its emphasis on global competition and sustainable development poses interesting challenges for computer scientists. New industrial systems, implementation and optimisation of specialised software and systems, networks with higher performance and security, faster computation: these all present exciting opportunities for graduates.

My colleagues in the company where I work now find it fantastic that I've learned so much during my Master's programme that is directly usable in industry.

Sara, Albania

Career opportunities
Just a sample of career opportunities.

- In a **company** you can work as a technology consultant, software designer, system developer, software architect, software analyst, project leader or industrial researcher.
- Many computer scientists end up in the **Research and Development** departments of industrial organisations (both large and small) to address technological challenges of all kinds.
- Your background allows you to deal with fast changing environments. This is a prerequisite for **project management positions**.
- A scientific career in **academia** where you think about deep problems of Computer Science. Together with other scientists and companies you work in European or international projects in a variety of disciplines.

There are a number of application areas with great economic significance and technological value where computer scientists can make a difference: optimal sustainable designs, high performance computing, biotechnology, wireless communication, smart cities, harbours, factories, self-healing materials, etc.

Orientation year
After completing your studies you can choose to look for work opportunities in Belgium. You can apply for an orientation year and extend your stay in Belgium by 12 months. Guidance and administrative assistance with this process is available through the university.

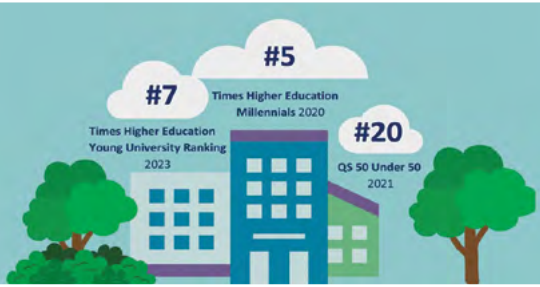
Why choose UAntwerp

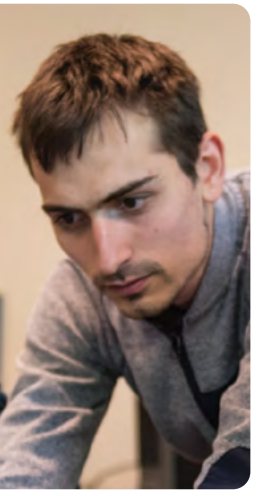
Our university is located in the **city of Antwerp**, in the heart of Belgium and Europe. The port of Antwerp is one of the biggest in the world. Antwerp is not just an ancient medieval and baroque city, full of history. It is also a bustling metropolis with a vibrant social scene, impressive architecture and cultural contrasts. Over 170 nationalities live here, more than in New York! This cosmopolitan vibe is also reflected at the University of Antwerp.

First-rate research and education make the University of Antwerp a wonderful place to study and to work. We foster the nexus between research and education. Internationalisation is key to our mission. It is no coincidence that the University of Antwerp is a partner in a highly promising European University Network, the Young Universities for the Future of Europe www.YUFE.eu.

As home away from home to over **20,000 students**, the University of Antwerp prides itself on operating on a human scale. Our faculty and staff will welcome you into top-notch infrastructure on one of our four campuses. While you're here you are also invited to enjoy our vibrant cultural programme, sports facilities and many student services.

The University of Antwerp **scores extremely well** in Young University Rankings





Testimonial

Education at UAntwerp
Professors here are incredible. They do a lot of research and they are very involved in what they do. As for the programme I really like it because it's a research programme. This means students have to develop all the contents, it is not just about studying the material given for the exam. It is a lot of work but it is definitely worth it. Another thing that I like is that we have two research internships during the master's programme, and in this way I get in contact with people who do research and create the science, which is a great opportunity for me. An interesting thing is that the PhD students at the University of Antwerp can help us if we need academic assistance. They create the assignments we have to do so their support is really helpful, since they are experts in the topic.

Why the University of Antwerp?
The University of Antwerp is among the top 200 universities in the engineering field so I checked its education offer. I found the content of the Master of Computer Science interesting and I really liked it. Also, it is a full two-year Master's programme and that's what I was looking for. So basically I chose the University of Antwerp because of the ranking, the programme content and also because of the relatively easy application procedure.

About the University of Antwerp
What I like the most here is the high level of education. Of course this means I have to work a lot but at the same time it is a great opportunity to develop myself.

Geraldo, Ecuador

Admission criteria

You have **direct access** to the programme with an

- academic Bachelor of Information Sciences
- academic Bachelor of Computer Science
- academic Bachelor of Engineering Sciences: Computer Science

With another Bachelor you need to have permission from the faculty.

Since the programme is taught in **English**, candidates with a prior degree issued outside Belgium, the Netherlands or Luxembourg are required to demonstrate their proficiency in English. They can do so in two ways:

- Either by submitting a l**anguage certificate** showing their TOEFL, IELTS or ITACE results (the level required can be checked on www.uantwerpen.be/admission)
- Or by **submitting proof** they have studied at least one academic year (or 60 ECTS credits) in an English-language Bachelor's or Master's programme.

Please note that the Board of Admission may still ask for additional proof of proficiency in English.

The professors and assistants are always happy to re-explain any topic and they try their best to make sure that we understood everything which makes keeping up with the challenging level of education a much easier process.

Elias, Lebanon

Application procedure

Candidates with a **Bachelor's** or **Master's degree** from a higher education institution in Belgium, the Netherlands or Luxembourg can enrol directly. Candidates who do not fulfil this condition or who need a visa must submit an online application through the online application tool **Mobility Online**. Applications for the academic year 2024-2025 can be started in Mobility Online from 9 November 2023 onwards.

Application deadlines
To submit an application through Mobility Online

- For non-EEA * nationals and for students who need a visa: **before 1 March 2024**
- For EEA nationals: **before 1 June 2024**

Enrolment deadline
4 October 2024
Enrolments start on 1 July 2024.

The academic year 2024-2025 starts on Monday 23 September 2024.

* **EEA** = European Economic Area
Member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxemburg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Slovakia, Spain and Sweden

ECTS credits

The University of Antwerp applies the '**European Credit Transfer and Accumulation System**' (ECTS) in all its degree programmes.

A full-time one-year study programme amounts to **60 ECTS credits** (30 ECTS credits per semester), which implies a student workload of about 1500 to 1800 hours. One ECTS credit stands for 25 to 30 hours of work including contact hours, preparatory work, study and assessment.

Quick facts

Level
Master

Language
English

Credits
120 ECTS credits

Number of years
2

Tuition fee per year *
EUR 1092.10 for EEA nationals
EUR 5800 for non-EEA nationals

Campus
Campus Middelheim

Faculty
Science

More information
www.uantwerpen.be/
computer-science

* subject to yearly revision

Contact

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Computer Networks, Data Science and Artificial Intelligence, or Software Engineering

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please check our website for the latest updates.