Maastricht University

Maastricht Science Programme

Maastricht Science Programme | 2019/20

Faculty of Science and Engineering

Why study at Maastricht University?

Established in 1976, Maastricht University (UM) is the most international university in the Netherlands with 16,700 students and 4,000 staff.

International orientation

A bilingual (Dutch & English) university, UM offers Europe-focused and internationally-oriented bachelor's, master's and PhD programmes. About half of the students and almost 40 percent of the academic staff are non-Dutch, representing over 100 nationalities. This cultural diversity greatly contributes to our 'international classroom'.

Small-scale teaching model

Ever since Maastricht University was founded, Problem-Based Learning (PBL) has been at its core. Students actively search for solutions to real life problems in small tutor groups of about twelve to fourteen students. A tutor guides the group and helps if necessary. That way, students learn to work independently on real issues, as they will also do in their work environment after graduation.

Multi- and interdisciplinary approach to education and research

At UM, education and research are integrated, and organised thematically: 'Learning and Innovation', 'Quality of Life', and 'Europe and a Globalising World'. Researchers, teachers and students from all faculties come together to try and find solutions for socially relevant issues, such as healthy ageing, sustainability, the European integration process and the impact of technological development.

Quality

Because of the high quality of its education and research UM does very well in (inter)national rankings and accreditations. We score, for example, high in the field of internationalisation and several programmes received the distinctive quality feature 'Top Programme'.

The city of Maastricht

Located in the centre of Europe and with a truly international feel, Maastricht is one of the oldest and most charming cities in the Netherlands. It can be reached through eight different airports and is well served by international trains.

Why study at Maastricht Science Programme?

- Unique innovative programme in the natural sciences
- Small scale college community within an excellent research university
- Open curriculum with broad offering in biology, chemistry, physics, mathematics and interdisciplinary subjects
- Personalized study programme consisting of one or more disciplines
- Student centered with a focus on personal development
- International classroom and outlook
- State of the art laboratory facilities at the Brightlands Chemelot Campus
- Embedded in the region interacting with businesses and organizations
- Preparation for Master's programmes at highly ranked universities

Contents

The programme in this brochure is accredited by the Accreditation Organisation of the Netherlands and Flanders (NVAO).
For more information on NVAO, please visit **www.nvao.net**

Maastricht University is a signatory of the "Code of conduct with respect to international students in Dutch higher education".
More information about this code of conduct is available at **www.internationalstudy.nl**

Maastricht Science Programme

What is Maastricht Science Programme?

Our society faces complex challenges in diverse areas such as energy, (bio)medical innovations, nutrition and the transition to a more sustainable and biobased economy. Many of these challenges are interdisciplinary, requiring a new generation of scientists, who are able to look beyond the traditional scientific disciplines.

To cater for this need for new scientists, Maastricht Science Programme offers a different educational approach to natural sciences. Gone are the conventional disciplinary boundaries. We challenge you to create your own curriculum, chosen from a wide range of disciplines, guided by advisors and driven by your own skills, interests and ambition; you can construct your own unique curriculum.

Do you want to focus on one discipline and become an expert in that specific field or do you prefer to combine disciplines and work on multidisciplinary knowledge and skills?

Everything is possible at Maastricht Science Programme.

Set against the historical backdrop of one of the oldest cities in the Netherlands, you will increase your knowledge and skills through our small-scale teaching methods Problem-Based Learning (PBL) and Research-Based Learning (RBL).

We encourage your collaborative and entrepreneurial spirit by letting you solve real-life problems with your fellow students, and by offering guidance in conducting your own research.

We offer a bachelor's programme that is taught entirely in English. With staff and students from all over the world, we take pride in our international community at Maastricht Science Programme. This diversity in cultural backgrounds and perspectives will certainly enrich your academic experience.

"Our combination of small scale college atmosphere and rigorous natural science education is unique. We place the student in the center and facilitate exceptional personal programmes. Whether you want to become a specialist in one discipline or study across disciplines, all is possible."

Thomas Cleij
Dean Maastricht Science Programme

Open curriculum

You are in command

Maastricht Science Programme is based on the Liberal Arts & Sciences tradition, which prepares for a non-traditional degree providing a broad experience due to flexibility in selecting courses. According to the Liberal Arts & Sciences philosophy, students are best prepared for a specific master's programme after completing a more general, broad bachelor's programme. What makes us unique is the focus on natural sciences, combined with an open curriculum. At Maastricht Science Programme, we give you the freedom to choose and the responsibility to direct your own education. Depending on your ambition and interests, you can pick from a wide range of courses in biology, chemistry, mathematics, physics, and various interdisciplinary fields such as biomedical engineering, entrepreneurship and neuroscience. With our open curriculum structure, you are free to focus on one discipline or combine multiple disciplines into a single bachelor degree.

We encourage you to explore different subjects from a variety of science fields to shape the academic path you would like to pursue. This unique way of tailoring your own courses, skills training and projects, and opting for different combinations according to your personal choice and aptitude, will prepare you for the multi-disciplinary challenges in our fast changing world.

Academic advising

We support you

We understand that the freedom to design your own curriculum can be a bit overwhelming. Which courses should I choose? Should I pursue other academic options like studying abroad for one semester? How to prepare for further studies? Just a few examples of questions that you could come across during your time at Maastricht Science Programme. We will help you find the answers.

At the start of your study, you will meet your dedicated academic advisor. Your academic advisor will continuously support you in making the right choices, based on your personal interests, ambitions and progress. This does not only involve advice on curriculum choices but also help with administrative procedures such as course registration. Our academic advisors have extensive expertise and are keen on assisting you in achieving your goals.

"PBL is a great way of taking control of your own learning. In the classroom, you and your classmates get to steer the conversation towards problems that require more attention. You then bring learning to its final destination after having researched more about these topics yourself. This way, you interact with the material in ways that a lecture cannot allow you to."

Danya BenYosef Castro - Chile

Educational approach

At Maastricht Science Programme, we moved away from traditional teaching methods. Through our challenging Problem-Based Learning (PBL) and Research-Based Learning (RBL) methodologies, it is all about you and how you actively build up your knowledge and skills.

With PBL, it comes down to you and your fellow students solving complex, interdisciplinary and real-life academic problems. Through literature study and group discussion, you will discover and work with content that you determine to be necessary for solving a given problem, developing both your creative thinking skills and professional skills such as presenting, debating, writing and working together. In small groups of 12 to 14 students, you will be guided in your learning process by a tutor, who will act as both subject matter expert and facilitator. The small class size creates an environment with plenty of opportunity to interact with students and tutors, making your active participation the key to your education's success.

For RBL, you will come up with a proposal how you would investigate a given problem. You will get hands-on experience carrying out your research at our state of the art science labs. By conducting your own research, you become rapidly acquainted with the scientific literature relevant to the topic, and you acquire the practical skills you need.

"Anyone can say they have an international community, but at MSP, you truly feel that international community vibe. Everyone is from somewhere else, and as a result everyone mingles with everyone. This makes that you get people with different perspectives which makes studying and problem solving unique when someone presents a solution you haven't thought of yourself. Overall I would say the international community here gives the MSP a one of a kind dynamic"

Martin Meerding - Thailand

The academic programme

The interactive and challenging way of acquiring theory and practice in courses, skills training and projects will not only provide you with the necessary knowledge and skills set to succeed in your future master's programme or afterwards in the workplace. Our hands-on approach will make studying science again what it should be: the thrill and fun of discovery.

Courses

Before choosing your own combination of courses, you will have to complete several mandatory courses in the first semester. These core courses ensure a common knowledge foundation for all students at Maastricht Science Programme, and are required for enrolling into higher level courses.

The courses at Maastricht Science Programme are taught at different levels, varying in complexity from introductory to advanced. To safeguard the quality of your degree, we limit the amount of introductory courses, and require a substantial amount of advanced courses on your grade list.

An overview of the courses on offer at Maastricht Science Programme can be found on our website **www.maastrichtuniversity.nl/msp**

Tentative overview of courses

	Biology	Chemistry	Mathematics and Computer Sciences	Physics	Neuroscience	Interdisciplinary
Core Courses	Introduction to Natural Sciences: Biology	Introduction to Natural Sciences: Chemistry		Introduction to Natural Sciences: Mathematical Foundations of Physics		Introduction to Liberal Arts and Sciences
100 Level Courses			Applied Statistics Mathematical Tools for Scientists	Elements of Physics	Introduction to Neuroscience Biological Foundations of Behavior	Basic Principles of Pharmacology Introduction to Biomedical Engineering Commercializing Science and Technology Sustainable Development
200 Level Courses	Cell Biology Ecology General Botany General Zoology Evolutionary Biology Biotechnology Genetics Human Anatomy and Physiology	Organic Chemistry Inorganic Chemistry Physical Chemistry Spectroscopy Chemistry for the Future: Generation and Storage of Alternative Energy Biochemistry	Optimization Linear Algebra Statistics Calculus Introduction to Programming Differential Equations Multivariable Calculus	Classical Mechanics Thermodynamics and Statistical Physics Vibrations and Waves Electromagnetism Quantum Theory Electronics Optics	From Sensation to Perception Neuropsychopharmacology	Nanomaterials Science and Technology Science-in-Action Molecular Toxicology
300 Level Courses	Molecular Biology Ecophysiology* Microbiology Animal Behavior Tropical Ecology Genomics and Proteomics	Organic Reactions Transition Metal Chemistry Modern Catalytic Chemistry Industrial Chemistry Quantum Chemistry Advanced Physical Chemistry Analytical Science and Technology	Game Theory Numerical Mathematics	Quantum Mechanics Theory of Relativity Nuclear and Elementary Particle Physics Relativistic Electro-dynamics General Relativity	Neuroscience of Action	Philosophy of Technology Advanced Microscopy: Theory and Applications Biomaterials Biobased Materials and Technology Creativity and Concept Development for New Business Systems Biology Regenerative Medicine Chemical Ecology* Science and the Visual Arts: Conservation and its Histories

All courses are 5 ECTS
** Modules with asterisk are offered once every other year*

Tentative overview of skills

	Biology	Chemistry	Mathematics and Computer Sciences	Physics	Neuroscience	Interdisciplinary
Core Skills						Research Methods Research, Data Analysis and Presentation Academic Skills
100 Level Skills				Basic Physics Laboratory	Data Collection Techniques in the Neurosciences	
200 Level Skills	Field Skills Exploring the World of Plants Practical Zoology Genetics	Chemical Synthesis Inorganic Synthesis Physical Chemistry	Programming	Electronics Physics Laboratory		Advanced Molecular Laboratory Skills Synthetic Biology Advanced Academic Skills
300 Level Skills	Molecular Biology Microbiology Skills The Limburg Landscape Applied Cell Biology Plant Breeding and Physiology	Advanced Organic Synthesis Transition Metal Chemistry Bioinorganic Chemistry Spectroscopic Methods Molecular Modelling Analytical Chemistry in the Art World	Topics in Scientific Computing	Advanced Physics Laboratory Advanced Electronics		Polymer Processing Programming in the Life Sciences

All courses are 2,5 ECTS

Practical skills

We expect our students to have a strong curiosity, ready to explore the world of science. You will have plenty of time to experiment at our state-of-the-art laboratories at the Chemelot Campus, nearby Maastricht. The Chemelot Campus is adjacent to one of the largest industrial chemical sites of Europe, and contains various companies with world-class laboratories and research facilities. Within this innovative setting, Maastricht Science Programme offers you an inspirational environment for your research and projects, enabling you to experience science at its best.
Doing research is what science is all about, but delivering your conclusions is equally important. Besides hands-on experience in the lab, you will also learn how to process your findings, write scientific reports and present your results to get your message across.

Projects

At the end of each semester, you will put your acquired knowledge and skills into practice during a four-week project. You will find it is more rewarding to seek your own answers than to search for what others previously published.

Bachelor Thesis Research

At the end of your bachelor's programme we take your academic achievements and creativity one step further with the Bachelor Thesis Research. We challenge you to come up with a topic that has not been researched before, and use the knowledge and skills you have acquired to conduct an in-depth research into this topic. Through research in our lab and reporting you will present your findings as your Bachelor Thesis Research, the completion of your academic career at Maastricht Science Programme.

Continuous assessment

During your time at Maastricht Science Programme, we will continuously assess you through different forms of examinations, like written exams, essays, lab reports, presentations and your participation in PBL. Testing your acquired knowledge and skills throughout the semester will provide you with regular feedback and safeguards your educational progress.

Overview Semester

One semester at the Maastricht Science Programme		
Period 1 (8 weeks)	Period 2 (8 weeks)	Period 3 (4 weeks)
Course A (5 ECTS)	Course C (5 ECTS)	Project Period (5 ECTS)
Course B (5 ECTS)	Course D (5 ECTS)	
Skills Training A (2,5 ECTS)	Skills Training B (2,5 ECTS)	

Binding Study Advice

You need to obtain a minimum amount of credits and you need to successfully complete the academic core in your first year of registration to be able to continue your studies. For successfully completed courses, ECTS (European Credit Transfer System) credits are awarded. One academic year corresponds to 60 ECTS credits. In your first year at Maastricht Science Programme, you need to obtain a minimum of 45 out of 60 ECTS, to be able to continue your studies.

Other academic options

As part of the curriculum, you have the opportunity to study externally for one semester. This could be at a faculty of Maastricht University or at another university in the Netherlands or abroad. We invite you to take the initiative and will support you in finding a suitable programme and making all the academic arrangements.

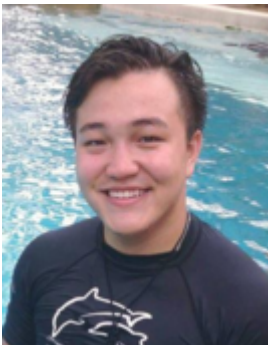
Academic year

An academic year at Maastricht Science Programme consists of two semesters, each split up in periods of several weeks. During each period you complete two courses and one skills training. After two periods, at the end of each semester you will put your acquired knowledge and skills of the past sixteen weeks into practice during a four-week project.

A week in the life of a student

You are expected to work a full-time week. In a typical week for you as a student you will have on average between 16-20 faculty contact hours. The remaining time is meant for self-study. Below an example of what a study week could look like for you as a Maastricht Science Programme student.

	Mon	Tue	Wed	Thu	Fri
08.30-10.30		Lecture: Microbiology		Tutorial 2: Introduction to Chemistry	
11.00-13.00	Lecture: Introduction to Chemistry	Tutorial 1: Microbiology			Skills: Basic Physics Laboratory
13.30-15.30			Skills: Basic Physics Laboratory	Tutorial 2: Microbiology	
16.00-18.00	Tutorial 1: Introduction to Chemistry				



"The RBL sessions help us to apply the different things that we learn in the theoretical courses by putting us in situations whereby we are able to see the actual science with our own eyes and not just through textbooks. We can apply these skills through the different projects. Being able to choose a project and working with other students, that might not be in the same scientific field as you, helps to bridge the different scientific subjects. This allows us to view science holistically and not in fragmented topics."

Matthew Verkaik – Singapore

Beyond your bachelor's degree

Where your bachelor's degree from Maastricht Science Programme will take you, will depend on your chosen curriculum and goals. Your Maastricht Science Programme degree can serve as gateway to many master's programmes at universities in the Netherlands or abroad, should you like to continue your academic career.

The bachelor prepares you for a variety of career opportunities, such as researcher at a university or scientific institute, scientist at a multinational company or you can even choose to start your own business in the science area of your choice.

Our graduates are admitted in Master's programmes such as:
- Interdisciplinary Neuroscience at Goethe University Frankfurt, Germany
- Materials Science and Engineering at EPFL, Switzerland
- Neurochemistry/ Molecular Neurobiology at Stockholm University, Sweden
- Chemistry at University of Helsinki, Finland
- Biobased Materials at Maastricht University, the Netherlands
- Graphene Technology at University of Cambridge, UK
- Molecular Bioengineering at TU Dresden, Germany
- Space Physiology & Health at King's College London, UK
- Molecular Medicine at Ulm University, Germany
- Marine Biology at University of Cape Town, South Africa

Some graduates have been accepted directly from our programme to join prestigious PhD programmes at research groups such as:
- DPhil in Biochemistry, Oxford University, UK
- PhD in Engineering, Cambridge University, UK

International community

The fact that all courses are taught in English, does not solely define the international character of Maastricht Science Programme. Staff and students come from all corners of the world to study and live in Maastricht. Surrounded by all of the cultural, social, and educational events that make it such a vibrant city, you will spend most of your time with your fellow students, in class and outside. We have set up a special student-only study and recreational area, the Common Room, where your different cultural backgrounds and interests will surely lead to interesting discussions.

It is all part of the inspiring and stimulating environment we like to offer, one which not only challenges you intellectually, but also empowers your personal development.

Who are we looking for?

At Maastricht Science Programme we have a lot to offer, but expect quite a bit in return from you. Besides the obvious fascination for science, we are looking for the curious and ambitious. Students, who are enterprising, think beyond borders, are open to change, and are willing to contribute actively to our international community. In short, we are looking for students who enrich our international community with their talents and personalities.

To assess whether there is a match between your interests and what we have to offer, we have a selection process. The Board of Admissions will determine whether you are accepted as a Maastricht Science Programme student based on this selection process. For the complete application and selection procedure, please go to the admissions section on our website: www.maastrichtuniversity.nl/msp

What do alumni have to say about MSP?

"Through this programme I learnt that I had an affinity for Chemistry! Moreover, I got an opportunity to enhance my chemical foundation by 'mixing and matching' information from the other courses offered. The biggest strength of this programme is the diverse and international community; which makes studying here so enjoyable and memorable. The programme changed my life and provided me with many opportunities. I hope that my future successes will help this programme become famous. I wish for people to say "MSP, that's where you got to be!"
Jaidev Dhavle

"MSP has been a great base for my current master in Drug Development and Neurohealth, due to the interdisicplinary approach I gained insight into not only the biological aspects but also the chemical and technical aspects. MSP has opened doors for me and pushed me to dig further. Due to my international contacts I was even able to persue an internship at a Pharmaceutical company in Washington D.C.!"
Bo van Engelen

"MSP is a such wonderful mixture of discovering new things, facing challenges, building knowledge and fostering friendship. All of this in the unbelievably welcoming and happy atmosphere which is created by the whole community, but most and foremost by the teachers and staff, who believe in us on both the academic and personal level. MSP empowers you as a student to find and pursue your passion with consistency and strength in order to prepare you for whatever endeavour you set out to do. "
Viktoria Obermann

"At the MSP, there are no barriers to scientific thinking, and that's what makes the programme and its format so unique. While most science Bachelor's programmes focus on knowledge transfer, the MSP takes education to the next level, by allowing its students to explore the newest topics in a scientific field, and propose student-led projects related to them. Next to that, I always knew I could count on the support of my professors and tutors to help me understand a subject area thoroughly. The MSP gave us so much freedom and support in our research projects that they were far more interesting and creative than any of the projects I have undertaken since. In many ways, the MSP pampers us, either through the interactive lectures, the problem-based learning system or the amazing laboratory facilities."
Varsha Vasudevan

"At the MSP I pursued an interdisciplinary education through the open curriculum format by taking courses from a wide range of disciplines, including Genomics, Organic Chemistry, Pharmacology and Calculus. This aspect allowed me to greatly deepen the understanding of Biology I had gained during high school. With its vibrant and positive community, the MSP also markedly influenced my approach to learning and team-working, which prepared me well for a career in Science."
Paolo Marangio

"I have gotten from this program not only the satisfaction to follow the subjects I like but also the relevant practical lab experience to stand out in my current Master program. An international, open minded, and caring community makes the MSP an amazing program for me. Looking back, I would choose it again if I could go back in time."
Boris Estrada Bonilla

Contact information

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Bachelor's Open Days

Saturday 13 October 2018
Saturday 9 February 2019

For more information and registration, please visit **www.maastrichtuniversity.nl**

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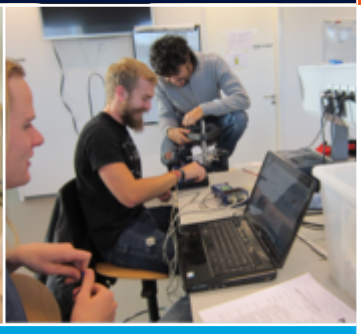

www.maastrichtuniversity.nl

Based in Europe, focused on the world. Maastricht University is a stimulating environment. Where research and teaching are complementary. Where innovation is our focus. Where talent can flourish. A truly student oriented research university.

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