



# Master Applied Nanotechnology

Master programme | Enschede



# Create the future with Applied Nanotechnology

The distinguishing feature of the master's degree programme in applied nanotechnology is the design and development of innovative products and applications in the field of nanotechnology.

The Master of Applied Nanotechnology is rooted in the dynamic and collaborative relationship between Saxion and the University of Twente.

Master students use both the excellent facilities at Saxion University of Applied Sciences and the laboratories in the High Tech Factory at the University of Twente campus.

## general

### The programme

This master's degree programme is unique in the Netherlands. It integrates themes of nanotechnology, design, client-focused solutions, and high-tech skills, with knowledge of various disciplines. This master's degree programme is all about translating innovative research into new applications.

### Year one

The first semester of the year is a foundation course. Both theory and practical training focus on various methods and techniques for developing innovative micro- and nanotechnology products and applications. Subjects in this first semester include physics, mathematics, physical chemistry and micro-/nanotechnology.

In the second semester, you are assigned an individual project, leading to a report that you must defend. The projects are inspired by a variety of specialisations including microfluidics, bio-functionalised surfaces and interface electronics. Tutorials offer you the opportunity to deepen your theoretical knowledge. During this first year, you will develop an understanding of the ethics of technology and enhance your creative thinking.

### Year two

In the second year, you study several compulsory subjects, including Entrepreneurship and Environmental Aspects of Nanotechnology. A major part of the second year is devoted to the final year assignment (thesis). This may focus on a specialisation area, an early prototype or an end product. You are responsible for arranging your own final year assignment. Obviously, you can make full use of Saxion's existing network of contacts.

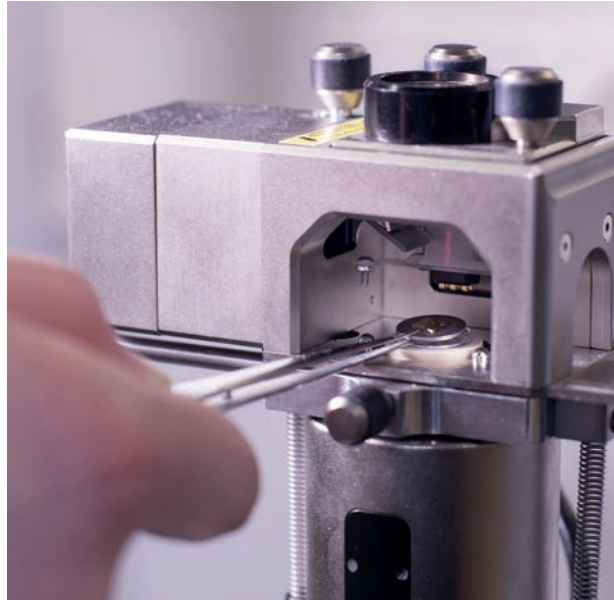
- Applying your knowledge of microtechnology and nanotechnology to design products and/or processes.
- Becoming a creative thinker! You will explore new possibilities during the design phase in order to apply nanotechnological expertise in new ways.
- Applying your theoretical knowledge in practice.
- Developing 'soft skills'; communication, teamwork, ethics and entrepreneurship.

## learning objectives

### Nanotechnology in Twente

Twente, a region in the east of the Netherlands, is the Dutch nanotechnology hotspot. Two universities are located here; the University of Twente and Saxion University of Applied Sciences. The region boasts impressive facilities and expertise in this subject area. MESA+ and MIRA are recognised throughout the world as leading institutions with state-of-the-art facilities. Saxion has two nanotechnology-based research groups focusing on the fields of nanobio and nanophysics, respectively. Pioneering research resulted in numerous successful spin-offs located in the area, allowing intensive interactions between companies and universities.

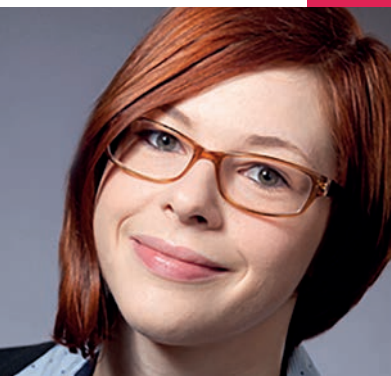
## 'The Master Applied Nanotechnology is unique in the Netherlands'



### Education in Twente

Together, Saxion and the University of Twente offer comprehensive programmes in nanotechnology:

- The University of Twente offers a master's degree programme in nanotechnology which focuses on principal research. Traditionally, most students transfer to a PhD trajectory upon graduation.
- Saxion offers a Master of Applied Nanotechnology. In this master's degree programme, the outcomes of fundamental research are applied to contemporary challenges or assignments, such as product development.



'My most rewarding experience was the research project that I initiated in the first year of my master's programme. The current process of taking new pharmaceutical drugs to the market is long, arduous and expensive. Preclinical testing on cell cultures and animals is fraught with difficulties and ethical questions. Clinical testing often fails because, what worked in preclinical trials may prove unexpectedly toxic when applied to humans. Thus, I am working on a project to replace the preclinical trials of drugs to treat heart disease, with a lab-on-a-chip. Human (stem) cells are used to make a heart cell on a chip. This chip is essentially a substrate with channels in which the cells are placed; heart muscles then grow in a muscle-like structure along the channels. This is an ongoing project and we think it has an exciting future!'

**Michelle Fleermann** (MSc in Applied Nanotechnology)



## Subject descriptions

### What will you learn?

During this programme, you will be applying your knowledge of micro and nanotechnology in innovative ways. On the basis of micro- and nanotechnology principles, you will be developing products and processes which contribute to the resolution of societal challenges in a range of areas, such as energy, healthcare, sustainability or even forensic science. On completion of your master's degree, you will be well versed in creative thinking and operating at the cutting edge of innovative applied nanotechnology design. You will develop new solutions and build and test prototypes in response to the challenges and requirements of the end user. By working closely with industrial partners, you will gain experience with high-tech manufacturing and design businesses.

The nanotechnology curriculum aims to develop the skills and knowledge of students in order for them to be successful in creating:

- Innovative products or methods using micro or nanotechnology
- New applications or markets using micro or nanotechnology
- Modifications of existing micro or nanobased products

### Course content overview

During the programme, you will have access to the latest international knowledge and literature. The teaching materials are in English, which is also the language of instruction.

### Your future

The Twente region, in which Enschede is situated, is a dynamic region and has the highest concentration of high-tech businesses in the Netherlands. Three to four new start-ups emerge in Twente every year. Nanotechnology is one of the driving forces for this growth and generates ever more jobs in the Netherlands, particularly in the east. Saxion works closely with a dynamic network of nanobased companies and various public sector partners.

As a graduate of the Applied Nanotechnology programme, you will be able to find employment in a range of technical positions, such as product or project engineer, application engineer or R&D engineer. You will be part of research and development teams for start-ups, crossovers and knowledge institutions, developing new products and/or processes, conquering new markets, designing new applications or modifying and implementing existing products and/or processes.

‘Nanotechnology generates ever more jobs in the Netherlands, particularly in the Eastern Netherlands.’

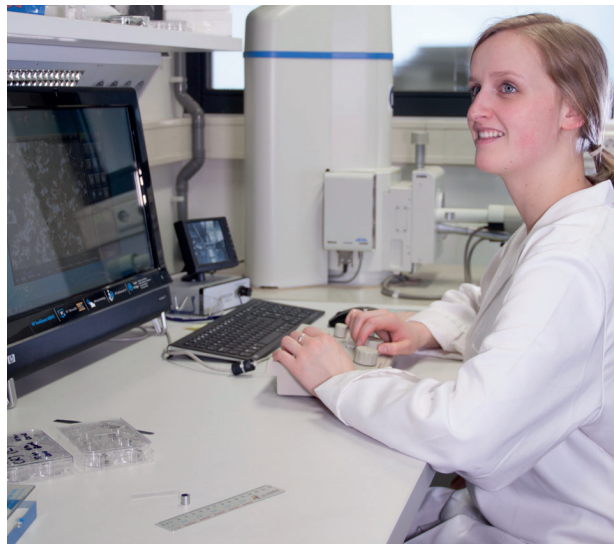
Using your technical expertise to market innovative, customised applications to clients is also one of the options. Upon graduation, you are entitled to use the title of Master of Science (MSc).

**General Saxion entry requirements**

- Students from all our international programmes must demonstrate that they have the ability, motivation and determination to successfully complete the programme.
- Students must have adequate English-language skills. For our master’s degree programme the entry requirement is an academic IELTS of 6.0 or an equivalent in another language test.

**Specific entry requirements**

Your admission is conditional on you holding a bachelor’s degree in one of the Life Science or Engineering programmes, for example programmes such as Biochemistry, Biotechnology, Chemical Engineering, Chemistry, Electrical Engineering, Mechanical Engineering, Mechatronics or Physics.



**Curriculum Master Applied Nanotechnology**

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Year 1	Calculus	Creative Facilitation	Nanomaterials	Society and Technology
	Interfaces and Polymers		In Depth Tutorial	In Depth Tutorial
	Dynamic System Modelling in Bio/Micro/Nanotechnology		Research & development Project	
	Practicum 1	Practicum 2		
Year 2	Business & Finance	Master Thesis		
	Data Analysis and Data Presentation			
	Toxicological and Environmental Aspects			

## Admission Process

An interview (online) forms part of the admission procedure. You will receive an email invitation for this. The interview will focus on the match between your background and expectations on the one hand, and the programme on the other.

## Tuition fee

Annual tuition fee: approximately €2.060 for EU/EEA students and approximately €8,900 for Non European (2018). Books: approximately €750.

For an extensive overview of costs, please refer to [saxion.edu](http://saxion.edu).



## Get Ready for a Smart World

Technological innovations have an impact not only on your social life but on your future professional life too.

At Saxion University of Applied Sciences, we teach you how these innovations impact your future professional field and how you can apply technology to perform your work even better, so no matter which programme you choose, you will be prepared for a world that is getting smarter.

Studying at Saxion also means growing as a person. Who are you as a person? Where do your talents lie and what do you want to excel at? We will help you develop a moral compass, build your self-confidence and broaden your horizon. You will learn a lot by doing a work placement or by taking a minor in another programme here, elsewhere in the Netherlands or abroad.

This way, you will learn to take responsibility and prepare yourself for a business endeavour or a challenging job. You are in control!

## More information

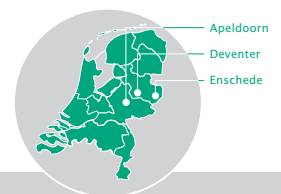
To enrol in Applied Nanotechnology, first of all you need to meet our general entry requirements. Please check [saxion.edu/entry-requirements](http://saxion.edu/entry-requirements) for more information. If you have any questions about the requirements or the programme itself, feel free to contact the School of Life Science, Engineering & Design: Mobile: +31 6 30468710 or E-mail: [Masterappliednanotechnology.led@saxion.nl](mailto:Masterappliednanotechnology.led@saxion.nl)

Would you like to apply? Start your application procedure at [saxion.edu/application-form](http://saxion.edu/application-form).

## Saxion Enschede

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## Saxion partners



# information



[saxion.edu](http://saxion.edu)