Twente Graduate School coordinates high-quality educational programmes based on topics closely related to the work of the university’s research institutes, taught and supervised by expert researchers. We offer structured PhD programmes for outstanding graduate students who are keen to pursue a career in scientific research.

Next to the PhD research project leading to a dissertation, a broad variety of discipline related, academic skills and career development courses enable students to specialize in their research area they are interested in while broadening their perspective on the societal context of technology and research.

UNIVERSITY OF TWENTE

High tech with a human touch: the University of Twente focuses on developing technology and studying its impact on people and society. The interface between technologies: that is where important and intriguing innovations occur.

Twente’s key research areas include nanotechnology, biomedical technology, IT, sustainable energy and governance. We do not approach new technologies in isolation, but in relation to behavioural, social, and management sciences, combining high tech with a human touch. As a modern, entrepreneurial university, Twente is renowned for its engineering ability in supporting industry and commerce, and its creation of new innovative businesses. This provides unexpected solutions in areas such as health, sustainable energy, water, education, and safety.

The University of Twente’s highlights are:
- Academic Excellence: The University of Twente is ranked number one in the 2012 Leiden Ranking for Dutch research universities and has been named among the world’s top 200 universities according to the Times Higher Education Supplement for six years in a row. The number of citations of scientific articles by the University’s academic staff in recent years was more than 20,000, ranking the University of Twente among the top 25 of the 250 biggest European universities.
- Campus university: The University of Twente is the only campus university in the Netherlands, providing a safe environment for students
- Student entrepreneurship: Over 750 Spin-off companies have emerged from the University.
MESA+ SCHOOL FOR NANOTECHNOLOGY

MESA+ is one of the world’s largest nanotechnology research institutes and it is the largest research institute in this field in the Netherlands. It boasts a state-of-the-art NanoLab with a floor area of 1250 square metres. The fact that its users are offered a wide variety of technologies and equipment to develop an almost unlimited number of applications makes this NanoLab quite unique. Through collaboration and a focus on interdisciplinary research, the excellent infrastructure and entrepreneurship, MESA+ is one of the world’s top institutes in the field of nano and microtechnology.

Associated MSc programme: MSc in Nanotechnology, but also Applied Physics, Chemical Engineering and Electrical Engineering.

BIOMEDICAL ENGINEERING

MIRA combines fundamental and applied research with clinical practice and encourages entrepreneurship and industrial collaboration. This unique scientific path stimulates a successful application of fundamental concepts and enables healthcare to rapidly introduce new treatments. Through close cooperation with hospitals, industry and governmental organizations MIRA aims to safeguard a leading position in Europe.

Associated MSc programme: MSc in Biomedical Engineering, but also Technical Medicine, Health Sciences, Mechanical Engineering and Electrical Engineering.

INFORMATION TECHNOLOGY AND COMMUNICATION

CTIT (Centre for Telematics and Information Technology) is one of the largest academic IT research institutes in Europe. Over 475 researchers actively participate in the research programme, which has a clear focus on integrating technology-based research and applying it to specific domains. It maintains an extensive international network of contacts and working relations with the academic world and industry. This network includes IT manufacturers, universities and research institutes, healthcare organizations, financial institutes, governmental organizations and logistics service providers.

Associated MSc programme: MSc in Computer Science, Human Media Interaction, Electrical Engineering, Advanced Mathematics and Business Information Technology, but also Applied Mathematics, Embedded Systems, Industrial Engineering & Management, and the one-year Master’s in Communication Studies, Educational Science and Technology and Psychology.

SOCIAL SCIENCES, INNOVATION & GOVERNANCE

The Institute for Innovation and Governance Studies (IGS) carries out multidisciplinary research and postgraduate research training in the governance and management of technological and social innovation. Issues of coordination, steering and operating institutions and networks in the public and private sectors are key focuses of research, utilizing a multi-level, multi-actor systems perspective, with reference to the social and behavioural sciences. IGS works to combine scientific excellence with relevance for our stakeholders in the public and private sector.

Associated MSc programme: all UT’s one-year behavioural and social sciences programmes, MSc in Business Administration and Public Administration, but also Construction Management & Engineering, Water Management and Philosophy of Science, Technology and Society.
**GEO-INFORMATION SCIENCE AND EARTH OBSERVATION**

The Faculty of Geo-Information Science and Earth Observation (ITC) focuses on knowledge of geo-information management and pushing the boundaries of this field. Through education, research and capacity building, ITC works to disseminate and embed this knowledge in developing countries and emerging economies.

**Associated MSc programme:** Geo-Information Science and Earth Observation, also possible via a number of other UT Master’s programmes.

**ETHICS OF TECHNOLOGY**

The Netherlands’ three universities of technology have combined their strengths and expertise to form the Centre for Ethics and Technology (3TU.Ethics for short): a centre of excellence in the philosophy of technology.

**Associated MSc programme:** Philosophy of Science, Technology and Society, via 3TU.Ethics of Technology Centre.

**COMPUTATIONAL SCIENCE & ENGINEERING**

The Computational Science and Engineering graduate school is embedded in MESA+ Institute for Nanotechnology as well as MIRA Institute for Biomedical Technology and Technical Medicine.

During the past decades Computational Science has become an increasingly important component in understanding and controlling the key mechanisms in the natural, biological and technical sciences. This interdisciplinary and multi-disciplinary field of research consists of the combination of mathematical and physical modeling and analysis, large-scale simulations, and the development as well as application of accurate high-performance computational algorithms.

**Associated MSc programme:** Applied Mathematics.

**SCIENCE-BASED ENGINEERING**

Science Based Engineering (SBE) is to improve the world by designing and developing new advanced technologies. Characteristic for Engineering is that problems are analysed as well as possible solutions are generated and their effects are judged. Science Based Engineering is a solution oriented approach that iteratively combines problem analyses, solution generation and scientific research.

Multidisciplinary and interdisciplinary research is carried out on the development of methods and technologies for the design and realization of new products and innovative processes and systems, based on a scientific approach.

**Associated MSc programme:** Civil Engineering & Management, Industrial Engineering & Management, Sustainable Energy Technology, and Mechanical Engineering.
EXPERIENCES FROM PHD CANDIDATES

NAME: TOM VAN DIJK
GRADUATE SCHOOL: INFORMATION TECHNOLOGY AND COMMUNICATION

“So far, I have fulfilled a part of my 30 education credits by attending summer schools, with a number of courses at the National Institute for Programming Research and Algorithms (IPA). I also participated in the TGS introduction days and I followed Research Management, one of the courses offered by TGS. Of the things I learned during this course, one of the most important was that, in science, it is crucial to know what other researchers are doing and to know where your research fits into the rest of the field. Personally, I find that the added value of TGS lies in its useful courses on offer.”

NAME: KOEN DIJKSTRA
GRADUATE SCHOOL: COMPUTATIONAL SCIENCE AND ENGINEERING

“By now I’ve been studying for doctoral degree for over a year in the ‘Applied Analysis’ department of applied mathematics within the computational science programme. My specific project is about modelling brain activity during acute hypoxia after a stroke or severe brain damage; a very interesting and interdisciplinary subject that combines ‘real maths’ with immediate social relevance and which, in addition, also fits in well with the UT’s motto of ‘High Tech Human Touch’.

In addition to academic development a doctoral education also provides plenty of opportunities to develop on a personal level, for example through the so-called ‘broadening courses’ offered by the TGS. During the two-day ‘TGS Introduction and Research Management Workshop’”
ADMISSION REQUIREMENTS AND ENROLMENT

There are two ways to enrol into a TGS programme. You can start a PhD programme if you have already completed a Master’s programme at the University of Twente or elsewhere, or you can start a Master of Science degree programme at the University of Twente and prequalify yourself for a TGS programme.

ARE YOU CURRENTLY A MASTER’S STUDENT?

<table>
<thead>
<tr>
<th>Degree</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc</td>
<td>You have already obtained your Master’s degree</td>
</tr>
<tr>
<td>PhD</td>
<td>PhD research</td>
</tr>
<tr>
<td></td>
<td>- Deepening, broadening, academic skills and career development courses, 30 credits</td>
</tr>
</tbody>
</table>

After successfully attaining a Master’s degree, you may enter a Twente Graduate School programme in the PhD phase. PhD candidates may either apply for a PhD position available within one of the research groups or obtain their own funding.

VACANCIES

Unlike in many other countries, most PhD candidates in the Netherlands are paid employees, often working directly for the university. Research projects are defined by the head of the research group, who then recruits graduate students to carry out project research. If a PhD position is offered in a research field of your choice, you are kindly invited to apply to such a vacancy. Vacancies for PhD positions at the University of Twente, including those connected to Twente Graduate School, are published on the vacancies website www.utwente.nl/vacancies.

OWN FUNDING

You may also enter a Twente Graduate School programme as PhD candidate with your own funding or with an international scholarship. In that case, research projects are initiated on the basis of proposals submitted by graduate students as part of their application procedure. A professor in a relevant field has to commit himself to the candidate and the proposed line of research. Before a proposed research plan is taken into consideration, it must be clear that the candidate plans to submit an application for a secured funding scholarship. Please note that the University of Twente is not in a position to offer fellowships or similar funding for PhD candidates, other than the vacancies mentioned above. For information about the documents required for the application see: www.utwente.nl/tgs.

ARE YOU CURRENTLY A BACHELOR’S STUDENT?

<table>
<thead>
<tr>
<th>Degree</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc</td>
<td>You have already obtained your Bachelor’s degree</td>
</tr>
<tr>
<td>MSc</td>
<td>- Two-year programme with discipline related courses, 120 credits*</td>
</tr>
<tr>
<td></td>
<td>- Opportunity to start integrated MSc/PhD programme in second year</td>
</tr>
<tr>
<td>PhD</td>
<td>PhD research</td>
</tr>
<tr>
<td></td>
<td>- Deepening, broadening, academic skills and career development courses, 30 credits</td>
</tr>
</tbody>
</table>

* Some of our Master’s programmes are one-year programmes (60 credits).

If you currently are a Bachelor’s student or have recently obtained your Bachelor’s degree, and are interested in pursuing a PhD through one of the structured research programmes TGS coordinates, have a look at the Master’s programmes involved.

Talented students can write their PhD proposal as part of their Master’s degree programme. For more information about the Master’s programmes, the admission requirements, and the tuition fee have a look at: www.utwente.nl/master.

RESEARCH HONOURS

This excellence programme will be tailored to your needs and offers the deepening of theoretical and practical knowledge. You will acquire more knowledge by means of extracurricular courses, trainings and meetings. The programme is an addition to your Master’s programme.

TGS AWARD AND BRIDGING FUND

The TGS Award is open for six selected candidates in the last phase of their UT Master’s. They should have demonstrable research skills and above-average results. Up to six months of funding to bridge the period between graduation and full PhD funding is available for all candidates. The winner additionally receives a check of EUR 2,500 to be spend on doctoral training. Qualifying students can be nominated by a UT supervisor.

ADDITIONAL INFORMATION

If you would like more information about Twente Graduate School, please go to the TGS website www.utwente.nl/tgs.

DISCLAIMER

Although this brochure was compiled with the utmost care, no rights can be derived from its contents.
In 2012, I completed my PhD at the Department of Philosophy, University of Twente. My decision to conduct my doctoral research at the University of Twente (and, indeed, in the Netherlands) was quite unusual and risky, since a majority of prospective PhD candidates in the field would not consider universities outside the U.S. and the U.K., and I had to leave my job in Hong Kong to relocate to the Netherlands. At that time, however, there was no other university offering an opportunity to conduct research on the philosophy and ethics of technology, and I was fascinated by various topics in this field. I therefore decided to move to the Netherlands and complete my PhD at the University of Twente, and I am glad I made this decision. I have learned a lot during my PhD study. While the department focuses on the philosophy and ethics of technology, it has a good mix of researchers in different philosophical traditions. Furthermore, the department provides a very supportive environment for PhD candidates.

I came to Enschede in 2012 to pursue my Master’s degree in Chemical Engineering and afterwards I decided to continue with a PhD programme in the Biomolecular Nanotechnology (BNT) group at the MESA+ Institute for Nanotechnology. Besides performing experiments, I went to several conferences and workshops as well. Among them is a conference entitled ‘Form and function of protein nanoshells: Assembly, mechanics, and dynamics’ in Lorentz Center, Leiden in February 2014 and the Dutch chemistry conference, CHAINS 2014, in Veldhoven. For me, conferences are very nice platforms to discuss ideas and experiences among young researchers and to learn from senior researchers. I am also very grateful to be a recipient of the Twente Graduate School Award 2013, which allowed me to join a conference in Sant Feliu de Guixols, Spain, namely the ESF-EMBO symposium of Synthetic biology of antibiotic production II.