



 TU Delft
Delft University of Technology

 TU/e
Technische Universiteit Eindhoven
University of Technology

UNIVERSITY
OF TWENTE.

Professional Doctorate in Engineering

Post-MSc programmes



“Technology is the driving force of the modern society. It is not only needed for economical growth: it is essential for our quality of life and to find answers to the serious problems our planet is encountering. Therefore we need many excellent engineers. A master programme in engineering is a good start, but it takes years of practice in industry to develop the right skills and to obtain the right insight to become a top-level designer. Therefore we developed the two year Professional Doctorate in Engineering (PDEng) programmes. With these programmes you can speed up your career essentially. The trainees of these programmes are strongly selected. Their design project is their passport to the world of technological design. In the past they made significant contributions to the technological development of companies, mainly in the Netherlands. Therefore I recommend young masters in engineering to apply for a PDEng programme.”

Kees van Hee

Director 3TU.School for Technological Design,
Stan Ackermans Institute

Professor Stan Ackermans, PhD

Professor Stan Ackermans, PhD, (1936-1995) was professor of Mathematics at TU/e before becoming the university's Rector (1982-1985). He championed the introduction of the design educational programmes. From 1986 until his death in 1995 Professor Ackermans was the first scientific director of the Institute that coordinated the design programmes within TU/e. Following his death, the institute was renamed Stan Ackermans Institute in his honor. Since 2006 it's called 3TU. School for Technological Design, Stan Ackermans Institute.

Introduction

Are you a graduate young professional or currently completing your Master of Science programme at a (technological) university? Are you looking for an even faster successful career in industry or business? Then you should consider applying to one of the technological designer programmes at the 3TU.School for Technological Design, Stan Ackermans Institute.

Eleven two-year programmes

Together the three Dutch universities of technology – Delft University of Technology, University of Twente and Eindhoven University of Technology – offer eleven exceptional two-year programmes that will put you on a faster track to a successful career in industry. In addition to broadening your technological expertise, you will also learn more professional skills that will enhance your career opportunities. Industry offers engineers from our programmes excellent jobs, because of the strong reputation of our graduates.

High-tech industry

As well as that, the technological designer programmes were initiated at the request of the Dutch high-tech industry. High-tech companies need professionals who can design and develop complex new products and processes and offer innovative solutions. All eleven programmes work closely together with high-tech industry, offering you the opportunity to participate in large-scale, interdisciplinary design projects. With this unique cooperation we provide you with a valuable network of contacts in industry. The technological designer programmes clearly meet an important need of the Dutch hightech industry. Over the past twentythree years almost 3,000 of our graduates have found challenging and exciting jobs with (multi-)national companies, including Philips, ASML, Océ Technologies, Akzo Nobel, Vodafone, Ericsson, DSM, Unilever, Schiphol Airport and TNO. These companies are united in their praise for the quality of the technological designer programmes and their graduates, and offer them a faster track in their career. To ensure their continued enthusiasm, the programmes employ a strict selection process, accepting only excellent young professionals and graduates with at least a Master of Science diploma from a (technological) university.



Krishnan Seetharaman from India is a second-year student of the Design and Technology of Instrumentation programme. He is doing his traineeship at NXP.

“At DTI, the curricular phase has a nine-month duration, during which you can opt for courses according to your needs and wishes. Halfway through the programme I knew what my design project would involve: Micro-Electro Mechanical Systems (MEMS). So I modified my subjects accordingly. The design project itself lasts a year, so I am currently doing research at NXP for this. I will soon be off to Singapore to do an internship at Systems on Silicon Manufacturing Company Pte. Ltd. After that I’ll be looking for a suitable job.”

3TU.School for Technological Design, Stan Ackermans Institute

As part of their more intensive cooperation, the three Dutch universities of technology have decided in 2006 to combine their technological designer programmes in the 3TU.School for Technological Design, Stan Ackermans Institute.

3TU technological designer programmes

The 3TU technological designer programmes offer you an opportunity to enhance your expertise and project management skills with an extensive hands-on assignment, supervised by experienced professionals. Each programme covers a different speciality, for example managing complex architectural construction projects, designing mechanisms for user interfaces for consumer products or developing high-tech software systems for software-intensive systems. The focus of the programmes is described further on in the brochure.

Professional Doctorate in Engineering

The two-year, full-time programmes all lead to a Professional Doctorate in Engineering (PDEng) degree. If you are accepted into one of the programmes, you will be appointed as a trainee for the duration of two years and will receive a salary. All technological designer programmes are taught in English. The structure of all programmes is more or less the same: during the first part of the programme you will gain extensive knowledge and experience of the latest design methods and their applications. You will also learn to work in interdisciplinary teams and will further develop your professional skills. You will apply what you have learned during the second part of the programme, when you will design an innovative industrial product or process for one of many prominent high-tech companies. The close cooperation between these companies and the technological designer programmes offers exciting career opportunities. Many of our graduates are offered a job with the company in which they did their final project or find work through the extensive network of contacts they have acquired.

Programmes

A short description of the eleven technological designer programmes is given on these pages. For more information: www.3tu.nl/sai.

Architectural Design Management Systems (ADMS)

Location: Eindhoven University of Technology

ADMS is a programme for young academic graduates who want to gain competences for the improvement and innovation of architectural design processes, both in relation to the remodelling of such processes and to their organisation and management. The emphasis is on the development of conceptual and working methods, which are scientifically robust and valid, to support practical and effective decision-making. To strengthen the market position of designers in the building industry, it is essential for design processes to be structured in a way that takes sufficient account of changing organisational structures of clients and users, the increasing complexity of construction projects, both functional and technical, the growing number of design specialists, and the need to increase efficiency and quality. The programme is based on relevant knowledge and theories provided by both the Department of Architecture, Building and Planning and the Department of Technology Management.

BioProduct Design (BPD)

Location: Delft University of Technology

The current developments in the life sciences and their vast opportunities for application require a new type of product designer. As a bioproduct designer you develop products based upon or related to biological systems. You apply the integrative and creative approach of technological product design in the life sciences to design and evaluate products in the industrial context. BioProduct Design focuses on the biological cell, and considers it as a means in synthetic biology, as a target in drug delivery or diagnostics or as an object in functional genomics and bio-informatics. Apart from the life sciences and technological disciplines, the programme addresses project management, economic evaluation, intellectual property and design methodology, which you integrate to design innovative bioproducts.

Designer in Bioprocess Engineering (DBE)

Location: Delft University of Technology

In the Designer in Bioprocess Engineering programme, you will develop into an experienced team worker with a strong, background in the Biosciences & Chemical Engineering knowledge required for innovative bioprocess design. Moreover, you will gain knowledge of business sciences such as economic evaluation and project management. This will allow you to evaluate the implementation of developed processes in the real life industrial environment, taking into account process sustainability. Throughout the programme, you will be trained to develop and apply an independent attitude, a critical approach, creativity and a focus on innovative applications of the inter-disciplinary field of Biochemical Engineering. The biotech industries in the Netherlands and other countries appreciate the added value of the graduate Designers in Bioprocess Engineering, and offer them a range of careers in all aspects of bioprocess development.

Design and Technology of Instrumentation (DTI)

Location: Eindhoven University of Technology

Instrumentation has replaced the human eye, ear and nose as sensors in high-tech environments such as industrial R&D laboratories and healthcare. The core of the DTI programme is the design of these innovative systems which go far beyond a simple piece of equipment. Successful project management is an essential tool to deliver the final device on time and on specification, supported by excellent personal skills as efficient reporting, audience-tailored presentations and techniques for negotiating tough decisions. A tight feedback loop with university is the learning cycle for these skills. Techniques from fields like mechanical and electrical engineering, biomedical engineering, physics, chemistry and information technology ('brains') are combined into well-functioning systems. Trainees go through a hands-on cycle of three projects in industry: a mini-project, a one-year project and an internship in industry in e.g. USA, China or Europe. The latter is the final 'proof of the pudding' of the skills acquired.

Information and Communication Technology (ICT)

Location: Eindhoven University of Technology

The TU/e Department of Electrical Engineering has chosen three important societal themes (see below). In the framework of these themes you will be able to gain skills to specify, design, build, test and evaluate complex multi-disciplinary systems.

The Connected World: The design, realization and validation of a coherent broadband and narrowband communications technology, wired and wireless.

Care and Cure: Topics are related to the medical side of electrical engineering; that is patient-centred care with the focus on prevention, early diagnosis and aftercare, with the goal of making hospital intake less necessary. The focus is on perinatology, cardiovascular disorders, neural disorders, sport and lifestyle.

Smart and Sustainable Society: The third theme aims at electrical networks and electro physical devices for transporting and manipulating electrical energy in a flexible, controlled and sustainable way regarding efficiency of costs, power and materials. The focus lies on intelligent power networks, smart actuators, automotive applications and the reduction of pollution and waste.

Logistics Management Systems (LMS)

Location: Eindhoven University of Technology

The logistics and management of complex industrial processes require insight in planning, organising and controlling the flow of goods from raw material to end-user, as well as logistic aspects of workflow management. The LMS programme is designed to broaden, increase and integrate your knowledge and skills in the field of logistics. The programme pays considerable attention to designing, building, testing and implementing complex logistics management systems.

Mathematics for Industry (MI)

Location: Eindhoven University of Technology

Mathematics is making an increasing contribution to the design of industrial products and processes. The MI programme is designed to develop problem-solving abilities that focus on the mathematical components of design processes taking place in industrial environments. This course concentrates on mathematical techniques and the development, use and analytical possibilities of mathematical models. There is also a link to science and management studies.

Process and Equipment Design (PED)

Location: Delft University of Technology

The Process and Equipment Design programme trains MSc graduates to become qualified designers capable of designing 'fit for purpose' and 'first of a kind' chemical products, processes equipment and devices. It encourages trainees to actively look

beyond the boundaries of their own discipline to recognise the challenges and restrictions imposed by product chain management, time and money and creatively aim for ingenious design solutions demanded by society. During design projects, industrial and academic knowledge are brought together and applied in real industrial assignments. As qualified designers, graduated trainees can expect to find challenging careers in the process industry and with engineering contractors.

Process and Product Design (PPD)

Location: Eindhoven University of Technology

The process industry demands an integrated approach to chemical, physical and mechanical processes. The PPD programme focuses not only on process design, but also on the relationship between the product, its functionality and its microstructure. This leads to an integrated approach to the development, design and implementation of processes for a large number of products in the process industry.

Software Technology (ST)

Location: Eindhoven University of Technology

The development of software for advanced systems has many different aspects, including requirements, specification design and implementation, testing deployment and organisation. The ST programme focuses on the project-based design and development of software for resource-constrained software-intensive systems such as real-time embedded systems. This programme addresses formal methods of specification, verification and design together with software engineering and system technology.

User System Interaction (USI)

Location: Eindhoven University of Technology

USI is a program for graduates with a Master's Degree in Engineering and Behavioral Sciences who are interested in the challenges that are imposed on people by fast developments in information and communication technologies and who want to improve the interaction between people and systems and make technology truly accessible and beneficial.

Our graduates are trained to design and enhance the optimal interaction between people and systems. They are experienced in working on challenging problems, in multidisciplinary projects and in international environments. USI graduates work on solutions and services for people in their home, work, and social environments.



Annemarie Elberse is a Process Engineer at Unilever R&D. She has a background in Food Process Engineering and, in addition to her normal duties in various projects, she guides trainees at Unilever.

“As a coach, I show trainees the ins and outs within the project and stimulate them to work independently. Of course I ensure that the content of their project remains of a high level and that the relevance of their research can be clearly recognized.”

Application, selection and degree

Are you interested in technological design and looking to enhance your skills and expertise to boost your career in business or industry? Are you ready for a two-year training programme while receiving a salary? If so, the technological designer programmes at the 3TU.School for Technological Design, Stan Ackermans Institute are exactly what you are looking for.

Application

Application is open to university graduates from the Netherlands and other countries. You will at least need a Master of Science degree or equivalent, preferably in the exact sciences. There will be an assessment and selection before you can enter the programme. The programmes of the Stan Ackermans Institute use strict selection criteria to ensure the required high quality. Excellent marks, motivation and a design-oriented attitude are vitally important. You should also have an excellent command of the English language.

Selection

You can apply by sending your letter of application with a complete curriculum vitae and at least two letters of recommendation (in English). Suitable candidates will be invited for an interview with the selection committee of the relevant programme. Please note that each programme has different starting dates, as well as its own specific admission requirements and selection procedure. The exact requirements and selection procedure for each programme are listed on www.3tu.nl/sai. Click on 'programmes' and visit the individual website of the programme. You can also contact the coordinator of the programme.

Appointment

If you are selected for the programme, you will be appointed as a trainee for the duration of the programme, up to two years. You will be a member of the scientific staff and will receive a salary in accordance with government regulations. Because you are a trainee, you do not have to pay a tuition fee.

Diploma and degree

On successfully completing the programme, you will receive a certified diploma. You will be entitled to use the academic degree Professional Doctorate in Engineering (PDEng) and will be registered as a Technological Designer in the Dutch register kept by the Royal Institution of Engineers in the Netherlands (KIVINIRIA). The quality of the programmes is assured by an assessment and certification procedure on behalf of the Dutch Certification Committee for Courses to become Technological Designer (CCTO, Nederlandse Certificatie Commissie voor Opleidingen tot Technologisch Ontwerper).



Chiu-Ling Chen from Taiwan obtained her PDEng degree for the Logistics Management Systems programme in 2009. She did her traineeship at ASML.

“ASML has a cooperation programme with TU/e in which people study LMS for two years and then work at ASML for three years. The principal project is the in-company design project, for which I compiled a suitable tool kit for maintenance and repair. In addition, I followed Master’s courses and special workshops for LMS students. A design education lets you combine academic and practical business experience and gives you a good idea of how you can put your university knowledge to good use within a company.”

Technological universities in the Netherlands

Delft University of Technology

TU Delft (TUD) is an entrepreneurial university at the forefront of technological development. As such it is constantly involved in furthering technological advances in the interests of society. By means of its fundamental and applied research and educational programmes, TU Delft trains the engineers of tomorrow. TU Delft offers 14 Bachelor's programmes and 34 Master's programmes. With more than 15.000 students, TU Delft is the largest and most comprehensive university of engineering sciences in the Netherlands. For more information: www.tudelft.nl.

Eindhoven University of Technology

Eindhoven University of Technology (TU/e), founded in 1956, is a research-driven, design-oriented university of technology, with the primary objective of providing young people with an academic education within the engineering science & technology domain. TU/e offers 12 Bachelor's programmes and 27 Master's programmes. In the research field the TU/e prefers to focus, within the engineering science & technology domain, on the specific areas in which it takes a significant role in the international scientific world, and in which it can make meaningful contributions to the knowledge-intensive industries and technological innovations. For more information: www.tue.nl.

University of Twente

University of Twente (UT), founded in 1961, is one of Europe's finest educational resources encouraging research and entrepreneurship in both technology and social sciences. A young and innovative institute, UT is internationally respected in areas ranging from public policy studies and applied physics to biomedical technology. It offers 20 Bachelor's programmes and 34 Master's programmes in the area of technology and engineering. And because there is more to life than studying, the Netherlands' only campus university has many sports and cultural facilities. For more information: www.utwente.nl.

3TU.School for Technological Design, Stan Ackermans
Institute offers eleven two-year postgraduate technological
designer programmes. This institute is a joint initiative
of the three technological universities of the Netherlands:
Delft University of Technology, Eindhoven University of
Technology and University of Twente.

More information
www.3tu.nl/sai
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