

Facing a challenging technological design issue?

 **TU Delft**
Delft University of Technology

 **TU/e**
Technische Universiteit Eindhoven
University of Technology

UNIVERSITY OF TWENTE.

 **WAGENINGENUR**
For quality of life

Our PDEng trainees will offer your organisation an innovative solution

Excellent designers

PDEng trainees all have a university engineering degree (MSc level) before they enroll in one of our two-year designer programmes. Selection for these programmes is tough: typically candidates are from the top 25% graduates of technological universities.

First year: special curriculum

During their programme the trainees spend their first year following a dedicated curriculum, which involves courses, interactive workshops and group and practical assignments, often in close cooperation with industrial partners. System architecture and design are at the core of this first year. In addition to topics of a more technological content, the participants acquire professional skills such as project management, communications and conflict handling. There are programmes where trainees start with the design project during the first year. In that case the design project runs parallel with the curriculum.

Second year: design assignment

In the second year the trainees carry out an in-company design assignment. Their prior engineering education and the supplementary design schooling puts them in an excellent position to take on this assignment in consultation with the client. University experts act as supervisors, providing state-of-the-art technology, advising on the structure and execution of the project and monitoring that the goals of the project are realised. Once the assignment has been completed, it is assessed by a committee of university and company experts. A positive assessment leads to the award of the degree Professional Doctorate in Engineering (PDEng).

A good investment

For around 5,500 euros per month your company can have the benefits of a highly qualified employee in-house for a whole year. On average assignments carried out by our PDEng trainees last 12 months. During this time the trainee develops complex new products and processes and offers innovative solutions to your technological design issues. Secondly, you get to know the person well and at the end of the project you are in the perfect position to decide whether to offer him or her a position within your company.

Personalised options

With several programmes your company has the possibility to select the trainee for your assignment already before the programme commences and define the curriculum in mutual agreement with the trainee. This ensures a seamless fit of the trainee's profile with the requirements of the end assignment. In this case your company invests in the first year of the trainee's programme and the design project may already start during the first year. Furthermore your company's employees can follow a personalised designer's programme. These options can be discussed with the concerning programme.

Dutch subsidies

Companies may be eligible for specific subsidies when their business focusses on innovation, research and development. On our website we have listed these subsidies. For more information visit:
<http://www.4tu.nl/sai/en/valorisation/subsidies/>



Innovative solutions

Is your company facing a technological problem that needs solving or a challenging design issue that needs unraveling? A PDEng trainee of the 4TU.School for Technological Design, Stan Ackermans Institute may be an attractive option. All our two-year programmes and tracks offer you the possibility to hire a young professional who can design and develop complex new products and processes and offer innovative solutions to your technological design issues.

A rust detector, a blood sugar simulation model, an intelligent shop window and an aircraft service planning system. These all have one thing in common: they were all designed for companies by PDEng trainees of the universities of technology of Delft, Eindhoven and Twente. The efforts of these technological designers and the supervision provided by university experts enabled the respective companies to achieve real, tangible innovative results. Hundreds of companies have already taken advantage of the opportunity to cooperate with the TU's whose PDEng programmes run under the common flag of the 4TU.School for Technological Design, Stan Ackermans Institute.

'The technological designers of the Stan Ackermans Institute often have a new perspective on engineering, conceive out-of-the-box ideas and provide new solutions.' - Raoul Voeten, General Manager Moog Bradford at Moog Space and Defense Group

Intelligent shop window created in collaboration with Philips. The window provides shoppers with relevant information about the products they see through the window.

Programmes and tracks

The Stan Ackermans Institute offers the following programmes and tracks (more programmes are in development, for more information visit www.4TU.nl/programmes):

Location

Delft University of Technology

Bioprocess Engineering (BPE)

In the BPE programme, trainees are trained as a multidisciplinary team expert with a strong background in Biosciences and Engineering subjects required for innovative bioprocess design.

Chemical Product Design (CPD)

The programme focuses on the design and development of structured materials, formulations, and devices for the specialty chemicals, personal care, healthcare, food, semiconductor, and energy sectors. The extensive and rapid developments in chemical, molecular, materials, and nano engineering have made the development of a whole new range of functionalised and specialised products possible.

Civil and Environmental Engineering (CEE)

The faculty of Civil Engineering and Geosciences of TU Delft has developed a PDEng programme in two tracks:

Sanitary & Environmental Engineering focuses on water management issues related to health technology, such as water collection, water and sanitation, environment and water transportation.

Structural & Railway Engineering is aimed at innovation in civil engineering, for example smart buildings, new materials and sustainable railways.

Process and Equipment Design (PED)

The PED 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, and to creatively aim for ingenious design solutions demanded by society.

Location

Eindhoven University of Technology

Automotive Systems Design (ASD) & Mechatronic Systems Design (MSD)

ASD focuses on systems architecture and design for modern high tech automotive systems in the context of Smart Mobility. The programme aims at a systems approach to problems around mobility and fuel efficient automotive systems, including communication systems and electrical driving, with emphasis on the multidisciplinary design aspects of project-based research and engineering and the challenges that are faced by the automotive industry.

The MSD programme aims at system synthesis and design of complex equipment, instruments, robotic and manufacturing systems and systems-of-systems, by combining in-depth understanding of the classical engineering fields, with multi-disciplinary, model based systems engineering to conceive, predict and verify cutting-edge system functionalities and architecture. The programme is closely connected to the TU/e High Tech Systems Center. Officially MSD is positioned as a sub-track of ASD.

Clinical Informatics (CI)

The Clinical Informatics programme is geared towards the design of information systems in healthcare. IT knowledge, but also knowledge of clinical and business processes are crucial to the design of optimal solutions, which really support the professionals in healthcare. The programme is carried out in close cooperation with hospitals and other care institutions all over the Netherlands. All trainees in the programme are required to be fluent in Dutch.

Data Science (DS)

Data Science is concerned with the problem of finding patterns and creating value from vast streams of data in the context of a data domain. The programme combines statistics, computer science, mathematics, and design theory with the discernment to explore data sets, gather insights, visualize results, and communicate meaningful findings to stakeholders taking into consideration underlying ethical and legal aspects.

Design of Electrical Engineering Systems (DEES)

Track: Healthcare Systems Design (HSD)

Healthcare industry requires a new generation of professional designers who can design new prototypes of healthcare systems or well-being devices within multidisciplinary teams. The HSD trainees develop in-depth understanding of the technical and user requirements in the health domain so that they are able to bridge the gap between high-tech technology and the health area.

Track: Information and Communication Technology (ICT)

The ICT programme trains designers in specifying, designing, building, testing and evaluating complex multidisciplinary systems in the domain of information and communication technology. The design of innovative consumer products and professional systems that communicate with their (global) environment (e.g. wireless and electro-optical communication) is extremely challenging. This leads to many new solutions, for example embedded software, monolithic integrated (opto-) electronic circuits in the field of telecommunication, medical applications and consumer products.

Design and Technology of Instrumentation (DTI)

Trainees in the DTI programme have a background in physics. They solve problems using sound, physical models, which represent the key parameters of the problem at hand. In the design loop they learn to both solve the problem in the right way as

well as to solve the right problem. Projects range from MEMS oscillators at a micron scale to density meters of dredger slurries in pipes of a meter diameter.

Industrial Engineering (IE)

The management of complex business processes and supply chains requires advanced solutions involving state of the art flexible business models, intelligent information systems, efficient and sustainable resource use, and sharp planning, execution and control of the operations in the chain. The PDEng programme IE develops the capabilities needed to innovate business processes and supply chains, based on up-to-date knowledge from science and industry.

Process and Product Design (PPD)

The chemical, food and polymer producing industry demand for an integrated approach of the disciplines chemical engineering, applied physics, mechanical engineering and technology management. PPD focuses not only on process design, but also on the design of novel products. The relationship between the production process and product properties like e.g. functionality and microstructure is the connecting thread in the PPD programme.

Qualified Medical Engineer (QME)

The Qualified Medical Engineer programme trains engineers to become effective designers in the clinical environment. Of course, engineering skills and knowledge of physiology are relevant. But also communication with health care professionals (and patients) is crucial to really get clear what their needs are and to determine how technology can improve patient care. The programme is carried out in close cooperation with hospitals and other care institutions all over the Netherlands. All trainees in the programme are required to be fluent in Dutch.

Smart Buildings and Cities (SB&C)

SB&C trainees are capable of integrating state-of-the-art technology through an integral design process, resulting in innovation for smart energy systems for the built environment. From different

backgrounds, a SB&C trainee contributes to the development of intelligent, energy efficient building components, building designs and urban plans aimed at intelligent reduction, supply and demand of energy with added value for the user.

Software Technology (ST)

The development of software for advanced systems has many different aspects. The ST programme focuses on the project-based design and development of software for software- and data-intensive systems from the High Tech Industry. The trainees get acquainted with the important concepts from diverse knowledge domains such as Data Science, Model Driven Engineering and Networked Embedded Systems, and learn how to use these to solve the actual industrial problems that our industry partners present to us.

User System Interaction (USI)

USI professionals are trained in trans-disciplinary science and techniques for the design and evaluation of user interaction with products and services. The programme focuses on technologically complex systems with high interactivity and high concentrations of information. The user-experience is at the heart of each product design. Technical options related to information and communication technology, cognitive and social psychology and design methodology of user-centered design are key concepts of the programme.

Location
University of Twente

Civil Engineering (CE)

Industry asks for highly qualified designers in the field of civil engineering, with knowledge of the different technical and nontechnical aspects of actual civil engineering issues (such as economics, policy, law and business administration, but also knowledge on project and process management). These designers need to have the skills to play a key role in multidisciplinary design teams that are concerned with solving these complex issues.

Energy and Process technology (EPT)

The technological designer in the field of EPT creates innovative technical solutions for products and processes in the nutrition, energy and process industry. For this purpose a multidisciplinary approach is required starting from functional and market requirements with an accent on quality, environment, safety, sustainability and recycling. Besides deepening and broadening of knowledge during the whole PDEng programme in EPT, several assignments in industry will be carried out.

Maintenance (M)

The PDEng programme Maintenance educates designers who create efficient and effective maintenance processes from a multidisciplinary perspective. The design has to comply to technical, financial, logistics and organizational specifications. A sound understanding of the physical mechanisms is key, as the basis for failing systems and components is in nature physical. By addressing both technical and operations aspects during the programme, a necessary link is established between these two fields of expertise.

Robotics (R)

The technological designer in Robotics creates innovative robotic solutions for medical, industrial and safety purposes, such as rehabilitation robotics, welding robots, and independently operating robots performing inspection tasks. Therefore a multidisciplinary approach is required with components from mechanical, electrical, computer and control engineering. The PDEng programme in Robotics allows the trainee to deepen and broaden their knowledge and to gain advanced application experience through a challenging assignment in industry.



The 4TU.School for Technological Design, Stan Ackermans Institute offers two-year postmaster technological designer programmes (PDEng programmes). The institute is a joint initiative of the universities of technology in the Netherlands: Delft University of Technology, Eindhoven University of Technology, University of Twente and Wageningen University.

The designer programmes have been around for more than 30 years and to date the TU's have already trained more than 3,900 technological designers. Most designers have joined the companies where they carried out their design assignments and many now fulfill a management position.

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The Association of Engineering Doctorates (AEngD)
4TU.School for Technological Design, Stan Ackermans Institute is an affiliate member of the Association of Engineering Doctorates (AEngD) – the UK-based organisation which promotes the value of the Engineering Doctorate (EngD) to government, industry and commerce. The affiliation between Stan Ackermans Institute and AEngD establishes a wider and more strategic industrial research collaboration and builds international links across the engineering research community.