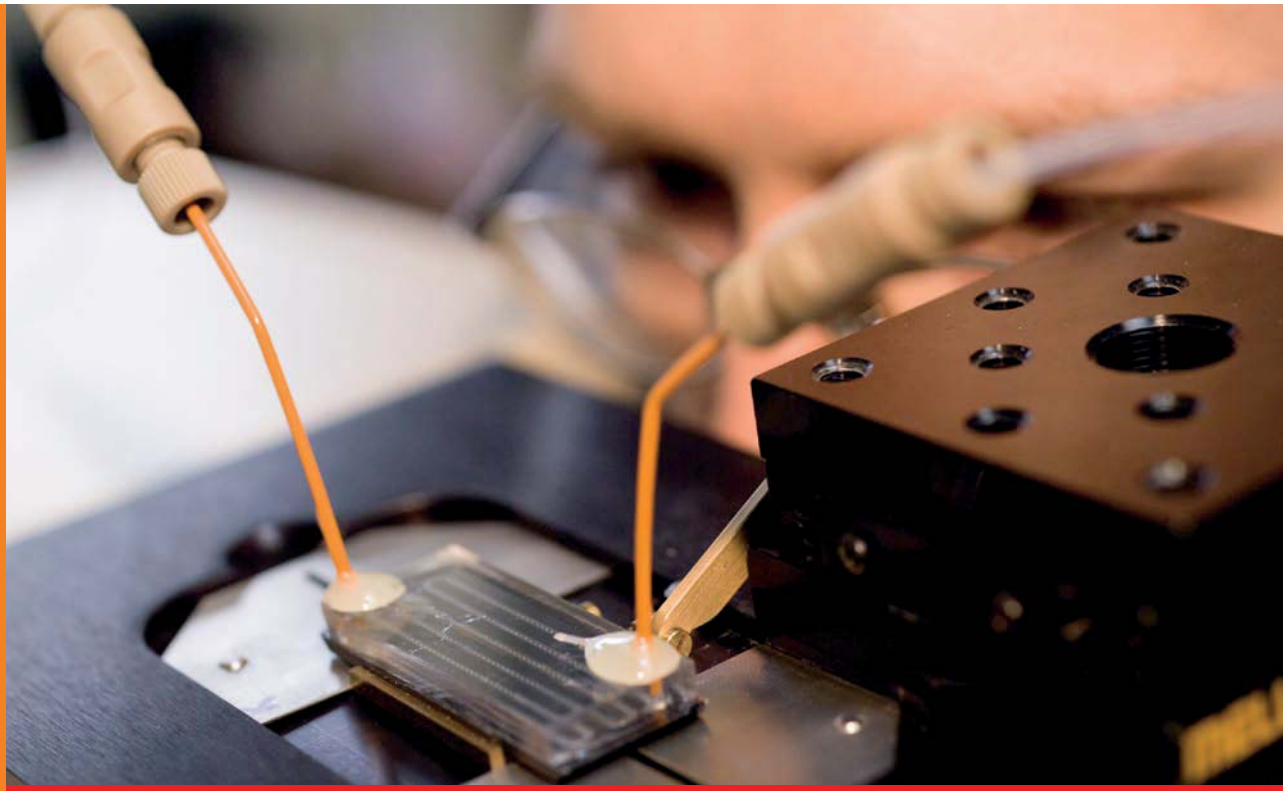
4TU.School for Technological Design

STAN ACKERMANS INSTITUTE



TU Delft
Delft University of Technology

TU/e Technische Universiteit Eindhoven University of Technology

UNIVERSITY OF TWENTE.

Chemical Product Design

Post-MSc programme

Dr. Ir. Gabrie M.H. Meesters
Formulation expert at DSM Biotechnology Center Delft - The Netherlands

The educational system in chemical engineering has in the past been focusing mainly on process design. In the last years the attention of product design has increasingly been given much more attention. The recent start of the new Professional Doctorate in Engineering (PDEng) traineeship Chemical Product Design was a logical and necessary addition.
Integration of product and process design is in many cases the best approach. Many refer to this as product driven process design. It means that a product is developed starting from the product characteristics, the needs of the customers, and the translation of these needs in to physical properties of the product. From that starting point a process design can be started. Since product design and process design need different approaches and also require different expertise, separate design projects are developed with chemical engineering, whereby during the product design project the core of the work deals with product specification development, customer needs integration and translation, whereas with the process design project, these items are most of the time already there. In the end a total design should be an integration of the two into a conceptual product and process design.
In the PDEng design projects that were done at DSM we have seen many different, mainly process design, passing by. We have experience with a few product designs done in the last few years. We can say that in general these design projects run well and give us many insights using the knowledge of the PDEng trainees which they acquired during their first year of the design programme. Clearly, the product thinking is new to many but mastered well by the trainees following the PDEng design programme.
It is the aim of the PDEng organization to strengthen their Chemical Product Design which is much more a reflection of the real work in many industries. In my opinion, industries have to support this effort and make the product design a success for the year to come.

Dr. Cristhian Almeida-Rivera
Global Supply Chain Manager, Food Solutions at Unilever, Vlaardingen - The Netherlands
Dr. Cristiane Fozzatti
Global Process Technology Manager, R&D, Skin bars GDC at Unilever, Valinhos-Brazil

With the spirit of leveraging strengths and turn challenges into opportunities, we have set-up a design and research collaboration with Delft University of Technology's (bio)chemical product & process design oriented Professional Doctorate in Engineering (PDEng) Programmes. The innovation scope of both individual design projects (12 months) and group design projects (3 months) has been around design assignments that required strong technical skills, sound strategic approach and, last but not least, a realistic sense of on-time delivery of Unilever's fast moving consumer goods.
The quality of the outcome has exceeded expectations in view of the short time frame of the assignments and the intrinsic level of uncertainty of the design activity. The achieved results have easily justified any associated investment.
From a professional development perspective, an additional benefit is derived from this collaboration. The PDEng trainees are hosted in one of our R&D centers and from day-1 fully embarked on the dynamics of an industrial environment.
This exposure to real day-to-day business certainly calls for the strengthening of soft and hard skills. This period will positively contribute to rounding off the trainee's education and allowing for a head start in his/her promising career.


Dr. Cristhian Almeida-Rivera

Kick-start your career in industry

The PDEng programme "Chemical Product Design" focuses on the development of structured materials, formulations, and devices for the specialty chemicals, personal care, health care, 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. Examples of such products include self-healing materials, high precision catalysts, functional membranes, high performance fibre composites, smart materials, self-assembling layers, rheological complex formulations, and photovoltaic materials.
In this traineeship programme you deepen your domain knowledge in specific areas, strengthen your engineering skills, and acquire know-how about designing these innovative products as well as bringing them to the market. Throughout several design projects you are coached by experienced design engineers and industrial partners to design implementable applications. The traineeship is fulltime, takes two years, and you receive a salary as a TU Delft employee. When you successfully complete the programme, you will receive a certified diploma and be entitled to use the academic degree "Professional Doctorate in Engineering" (PDEng). This gives you a head start for a challenging career in the high-tech and chemical product-oriented industry.

Programme structure

Most of the introductory year is dedicated to advanced training and workshops in engineering design, social-economic aspects of design, as well as professional and business skills. The emphasis will be placed on the technical integration of disciplines, engineering design in an industrial context, and the recognition of the role technological product design plays in society. Besides the core programme you can select elective training modules in one of the five different profiles:

- Energy conversion & storage systems
- Nano-structured materials
- Optical materials
- Polymers & composites
- Surfaces & coatings

Group Design Project
The first year also features the Group Design Project, in which you work in a team with other PDEng trainees on a design project from the industry. You are guided by an industrial principal, an academic coach, and an experienced design engineer. In this project you take on different roles, such as project manager, project secretary, or product designer, and get acquainted with the industrial view on product design and development. In the Group Design Project you integrate knowledge, skills, and know-how of the various training modules in order to develop solutions to the challenges in the relevant industry sectors.

Individual Design Project
In the second year of the traineeship you work on an Individual Design Project. Your project is performed in, or in collaboration with, the product development department of an industrial partner, or you work as a developer in a high-tech product-oriented company. The design may provide a solution for a specific problem, but it may also cover aspects of the entire product design process, from idea via feasibility and development to manufacturing. A detailed design has to be delivered, in which creative design alternatives are generated, analysed, and evaluated and promising design(s) chosen based on a systematic and quantitative argumentation.

Career perspective
Upon graduation, you receive a certified diploma and earn the degree Professional Doctorate in Engineering (PDEng). You will be registered as a Technological Designer in the Dutch register kept by the Royal Institution of Engineers of the Netherlands (KIVI). The quality of the programmes is guaranteed by

an assessment and certification procedure on behalf of the Dutch Certification Committee (CCTO). The product oriented industries in the specialty chemicals, personal care, health care, food, semiconductor, and energy appreciate the added value of this PDEng degree, which makes it highly relevant for your future career. In many cases the PDEng graduates have already obtained job offers during the traineeship and make a steep career path in the industry.

Application

To apply for the programme it is required that one holds an MSc degree in Chemical Engineering, Materials Engineering or Nano Engineering or combinations, or comparable, with very good results. Furthermore, we expect a demonstrated interest in product design and development, sense of application of technology in industry, and an interdisciplinary attitude. The application procedure for the Chemical Product Design programme consists of three stages.

1. Submission of your on-line application form

Evaluation of the candidate based on the information that is provided through the application form on **www.pdeng.tudelft.nl/cpd**

2. Evaluation of documents

The candidate is evaluated based on the letter of application, curriculum vitae, content and performance in BSc and MSc education and references.

3. Interview

Evaluation of the candidate through a presentation and an interview.

After a positive outcome of the strict selection procedure you are hired as a salaried (approximately € 1,750 a month) employee of Delft University of Technology. TU Delft offers you two sequential, temporary contracts, both valid for one year. After the first year, the Programme Committee assesses your progress. It is mandatory that you successfully complete all first-year modules, before admission to the second year of the programme is granted.

During my final year as a chemical engineering masters student at the Delft University of Technology, I was looking for my next career step. I gained interest in joining the PDEng programme from information sessions during one of the master courses as well as from contact with PDEng trainees. My motivation to join the programme was to advance my engineering skills while at the same time broaden my design capabilities by working on industrial relevant projects.
Looking back, I can say that I certainly have developed myself as a professional designer. Having done the TU-Delft chemical engineering masters programme, I can also say that, the PDEng programme prepared me for the professional industry at a completely different level. The knowledge I acquired from the variety of advanced and other relevant courses was all new, and they taught me to work result oriented and efficiently towards the goals, from working on real life examples and exercises. However, I obtained actual hands-on work experience from working on two large industrial projects.
The three-month Group Design Project (GDP) for Unilever was challenging, as it required to apply all aspects of product, process and equipment design. But above all, during this project I could improve my organization, management and communication skills, as working in a group of trainees with an international and diverse background demanded this. I performed the one-year Individual Design Project also within Unilever, which I enjoyed a lot. Working as a part of a big multinational with stakeholders from different countries was a unique experience.
The PDEng programme was a memorable experience. I not only completed the programme with bags of new knowledge and skills, but also with many new friends.

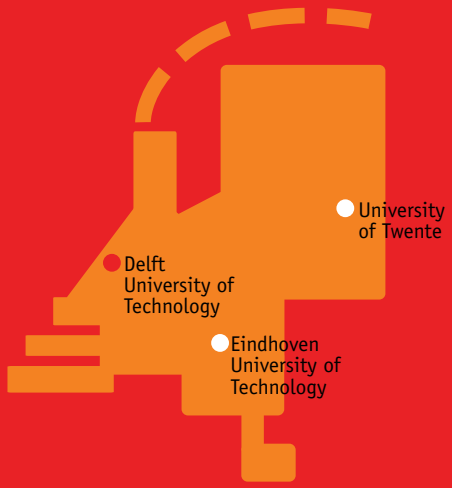
www.4tu.nl/cpd

About TU Delft

With its 20000 students and 5000 employees TU Delft is a major university. This means many opportunities and facilities for students and ample capacity for individual supervision.
Delft is an attractive city for students. Conveniently arranged, with everything you need for a varied study time: cozy bars, affordable restaurants, great shops, cinemas and theatres. Delft is situated in the middle of the 'Randstad' urban conurbation, with Amsterdam, Rotterdam and The Hague within easy reach. And no other university city has as many active student societies as Delft does.

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

More information: www.4tu.nl/sai



For further information
Chemical Product Design programme
Faculty of Applied Sciences
Delft Product & Process Design Institute
E-mail: cpd-pdeng@tudelft.nl
Website: www.pdeng.tudelft.nl/cpd

www.facebook.com/DPPDI
www.linkedin.com *(Professional Doctorate in Engineering)*