

# Professional Doctorate in Engineering degree (PDEng)

## About the PDEng programmes

Delft University of Technology, University of Twente and Eindhoven University of Technology, organised with Wageningen University in the 4TU.Federation, offer full-time two-years post-masters academic programmes (120 EC) including a final industrial project since 1986.

As of January 1<sup>st</sup> 2006 the 4TU.Federation has created a joint institute for the programmes called the 4TU.School for Technological Design, Stan Ackermans Institute.

The programmes fall within the 3rd cycle of higher education, as do the doctorate PhD programmes.

## Professional Doctorate in Engineering (PDEng) degree

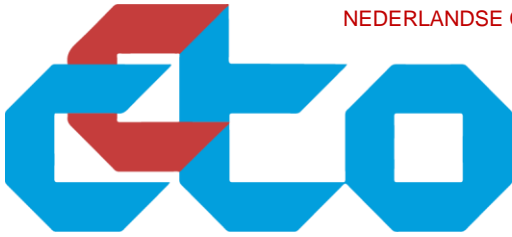
As of January 1<sup>st</sup> 2004 all candidates that successfully finalise one of the programmes are awarded the degree Professional Doctorate in Engineering (abbreviated PDEng, to be placed behind the surname). Before this date candidates that successfully completed one of the programmes received the degree Master of Technological Design (MTD).

## Registration and certification

All diplomas are entered into a central Register, which is kept by the "Koninklijk Instituut Van Ingenieurs" (Royal Dutch Society of Engineers). All programmes are certified by the Dutch Certification Committee for Technological Design Programs consisting of representatives from the Universities of Technology in The Netherlands, the Council of Central Industrial Organizations in The Netherlands and the Royal Dutch Society of Engineers. Further information can be found in the [Diploma Supplement](#) issued by the CCTO.

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## Diploma supplement

### *Professional Doctorate in Engineering programs*

A Professional Doctorate in Engineering program is a program of advanced training which, whilst adhering to the university criteria for the award of a doctorate, is designed to meet specific needs of a professional group external to the university, and which develops the capability of individuals to work within a professional context. It advocates a scientific research based approach to solving problems, a systematic way of collecting evidence and a critical, reflective and independent mind for the analysis and interpretation of evidence.

A design engineer has the competencies to create technical solutions for products, processes, and systems based on functional requirements as well as on business/market requirements, within the context of a general societal character (attention for environment, safety, reuse, et cetera). This is to be achieved by means of a methodological approach with the following characteristics: (1) the goals formulated by industry should be concretized in a measurable and verifiable specification, the so-called program of demands or requirements, (2) a concept for the product, process, or system is designed using and integrating, in principle, existing knowledge and techniques from engineering sciences as well as from the disciplines associated with the problem domain, (3) this concept is validated with respect to the requirements and then concretized within a specific amount of time after negotiation with the customer.

The goal of a PDEng program is to add an additional dimension to a full M.Sc. program by extending it and integrating it with new elements. A PDEng trainee develops the competencies for synthesis and interdisciplinary work: that is, the “can do” of technological design. The emphasis in these programs is on developing and strengthening (exercising) the competencies necessary for finding technological solutions in (1) designing products and constructions, (2) designing processes for realizing these products, (3) designing systems for transport of people, information, or goods; (4) designing (management) control systems, as well for productions as for transport. For finding such solutions an effective collaboration with representatives of different domains is inevitable and this needs to be practiced during the training.

Aspects that need to be addressed in the training are (1) extending the scope of the original studies by introducing elements from related technical disciplines, (2) extending the scope by emphasizing technological design in a multidisciplinary setting, (3) extending the scope by introducing elements from management sciences, (4) extending the scope by integration of knowledge and skills (competencies) from disciplines, different from the engineering sciences and/or exact sciences.

Next to broadening, in some complicated technical areas, a deepening of knowledge will be necessary. In a training program it can be necessary that applied scientific research is done to be able to acquire new knowledge and to be able to integrate that knowledge in a design.

This diploma supplement is provided by the Dutch Certification Committee for Technological Design Programs (CCTO). The CCTO is charged by the technical universities to certify the technological design programs according to the standing criteria. The CCTO empanels a review committee for every five years for every program to advice the CCTO whether or not to certify.