



MSc Programme

Integrated Product Design (IPD) and Design for Interaction (DfI)

Specialisation

Medesign

Healthcare is one of the fastest growing industries across the world. In the West the accent is more on cure and care, in contrast to developing countries, where the accent is on prevention. But whether the emphasis is on cure or prevention, health care professionals rely on increasingly complex equipment in their work. The design of that equipment requires highly trained specialists with expertise in engineering, industrial design and medical sciences. The aim of the specialisation in Medesign is to train these specialists.

Designing for medical applications demands inventiveness as well as the ability to integrate thinking across functional interfaces and to translate complex capabilities into designs that serve the health care practitioner and the patient. Advances in the field result when designers combine creativity, engineering excellence, and vision. The Medesign specialisation trains dedicated and skilled engineers in human anatomy, physiology, medical technology, healthcare systems and some basic surgical techniques. It also offers a pathway for health specialists to move into the medesign field. Participants in the programme are challenged to develop products that meet the needs of surgeons, doctors, therapists and patients and to solve problems in human-product interaction.

Products for Healthcare

Medesign students will not only meet the course objectives of their IPD or DfI programme, but also:

- learn about the structure and processes of the human body;
- gain insight into healthcare and the products that are used in this field;
- learn to perform basic (minimally invasive) surgical techniques;
- learn to carry out research in the medical field related to product development.

The curriculum

To specialise in Medesign you are required to complete at least one project worth 9 EC and a thesis project focusing on Medesign. Additionally, you need to select at least 9 EC from the Medesign electives list. Other projects and modules with a healthcare focus are optional.

The other courses to be taken will be part of your IPD or DfI Master's programme.

Medesign Electives:

- **Anatomy and Surgical Techniques for Engineers** (3 EC)

This module, taught at the Erasmus Medical Center Rotterdam, trains the student in the body's musculo-skeletal system for biomechanical modelling

purposes, and in basic techniques of minimal invasive surgery, providing students with a feel for surgery and an understanding of what it involves.

- **Capita Selecta Medisign** (3 EC)
These are monthly meetings at which design challenges and research topics in the medical field are presented and discussed. The main objective is to encourage an exchange between professionals and Medisign students.
- **Design of Products in Healthcare** (3 EC)
This course addresses the many issues considered when designing products for healthcare applications. The main objective is a design method specific to a medical context.
- **Biomechanics** (3 EC)
Main topics include the skeleton as a mechanical system, the form and function of joints, and the mechanical properties and functions of biological materials such as bone and skin.
- **Cognitive Ergonomics for Designers** (2 EC)
Cognitive ergonomics are concerned with mental processes, such as perception, memory, reasoning, and motor response, as they affect interactions among humans and other elements of a system. Topics to be expected include mental workload, decision-making, skilled performance, work stress and training.
- **Medical Technology and Health Care Systems** (5 EC)
Medical Technology & Health Care Systems covers such topics as 1) the physical and engineering principles involved in specific medical devices used in medicine; 2) the clinical use of these devices by medical doctors, nurses and patients in the health care system; 3) regulations and standards concerning the clinical use of these medical devices
- **Biomedical Engineering Design** (4 EC)
Biomedical Engineering Design introduces the field of prosthetics and orthotics. A design philosophy and method is imparted to students by examining the entire design processes of several prosthetic/orthotic products.
- **Bio-Inspired Design** (3 EC)
This course looks at biological organisms with smart structures, unusual mechanics or clever processing methods and analyses examples of bio-inspired instruments and machines.

Career prospects

Graduates who specialise in Medisign are all-round engineers who have experience in design in an inter-disciplinary team in the medical field. In this growing field, there are abundant design opportunities. Participants in the Medisign programme have found jobs at medical design companies like Indes and Spark Design, as well as multinationals active in the medical equipment field such as Philips Medical, Drager and Siemens.

Admission requirements

- Graduates with a Bachelor's degree from a Dutch University of Applied Sciences (HBO): Applicants holding a relevant HBO degree such as Human Technology, Mechanical Engineering, Human Movement Technology, Industrial Engineering, Civil Engineering, Aeronautical Engineering, and Engineering Design & Innovation may be admitted after following a bridging programme. Applicants with other degrees should contact one of the academic counsellors. All candidates must make a formal application for admission; for more information, please contact the academic counsellors.
- Dutch university graduates: Applicants with a BSc in Industrial Design from TU Delft, Eindhoven University of Technology, and Twente University will be admitted to the Master's programme without conditions. Applicants with another BSc from a Dutch university may be admitted to the Master's programme, depending on previous training and competence. Students will be required to enrol in a bridging programme. Required entry level skills include the following: Product Design, Information Design, Interaction Design, Multimedia Design, Basic Research skills and knowledge of technical product development aspects. If you are not sure whether your degree qualifies you for admission, please contact one of the academic counsellors listed below.
- International applicants: Applicants from non-Dutch universities can apply on the basis of grades, portfolio, the reason they wish to enroll in the Delft programme and their study and career objectives. These applicants must contact the IDE International Office before application. For details on admission requirements and procedures, see www.ide.tudelft.nl/international.

For further information: www.ipd.msc.tudelft.nl – www.dfi.msc.tudelft.nl

Admission and application: national applicants

Ms J.C. Thieme or Mr J.H. Wiltjer, Academic counsellors

T +31 (0)15 27 82941/83041 E master-io@tudelft.nl

Admission and application: international applicants

International Office IDE

T +31 (0)15 27 81077 E internationaloffice-io@tudelft.nl

Further information on course content

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