

INTERNATIONAL MASTER OF SCIENCE IN BIOMEDICAL ENGINEERING

PROGRAMME JOINTLY OFFERED BY GHENT UNIVERSITY, VRIJE UNIVERSITEIT BRUSSEL, UNIVERSITY OF GRONINGEN, CZECH TECHNICAL UNIVERSITY IN PRAGUE, RWTH AACHEN UNIVERSITY, TRINITY COLLEGE DUBLIN

120 ECTS CREDITS - LANGUAGE: ENGLISH

WHAT

The International Master course prepares students from Europe and beyond for a profession in Biomedical Engineering. The biomedical engineer generates knowledge from the molecular to the organ and system level. You will develop new materials, devices, tools, systems and methods for the early diagnosis, prevention and treatment of disease in order to improve and guarantee the health care and quality of life of the society. Biomedical Engineering (BME) is a broad multidisciplinary area, involving many sub-specialisations, varying from regenerative medicine to implant design and from PET-scan imaging to biosensors. It is, for a single university, difficult to have in depth knowledge of all sub-specialisations in Biomedical Engineering to teach their students on an adequate level. In addition a genuine European and international learning experience is difficult to gain when students stick to a single university. Therefore a consortium of six well reputed universities has merged their knowledge and specific expertise into a two-year European Master in Biomedical Engineering. The student follows the first and second year at two different universities but any combination is possible. In this way, the student has maximum freedom to create a master's programme tailored to his/her interests and to choose the preferred specialisation.

STRUCTURE

During the first two semesters (60 credits) each university teaches the students about basic biomedical engineering topics. These courses define the basic level of competence of students and prepare them for a subsequent specialisation. Traineeships have to be followed in a hospital and/or industry. In the third semester (30 credits) students move to one of the other participating universities to follow lectures within a specific specialisation domain. Lectures are based on key research lines of these universities, so students get state-of-the-art knowledge, preparing them optimally for future developments in BME:

- **Groningen:** Biomaterials & Nanotechnology, Imaging Physics
- **Aachen:** Tissue Engineering, Artificial Organs & Implants, Image-Guided Therapy & Molecular

Imaging

- **Dublin:** Tissue Biomechanics & Regenerative Medicine, Neural Engineering
- **Ghent & Brussels:** Radiation physics & Medical imaging, Biophysics for Medical Applications
- **Prague:** Medical Instrumentation, Modern Physical Methods in BME, Medical Imaging Instrumentation

Master's dissertation

In the final semester students work, individually, on a master project and write a master dissertation. This project can be a research and/or a design assignment. The project will be finalised with a written report and an oral presentation. During this project the student applies all acquired knowledge and skills: to solve a problem by designing a device (in case of a design assignment); to formulate answers to a scientific question by performing scientific research (in case of a research assignment). Assessment will be based on the report and a presentation.

LABOUR MARKET

Students are trained to do research and critically reflect on their work and they are well prepared to perform as a PhD-student at a university, do research in large industry R&D-departments or to perform applied research (e.g. design of a second generation discus prosthesis, minimally invasive heart support devices ...). Thanks to their broad and solid scientific training and international view these students are also well prepared for the task of product manager in an industry, leading an R&D-department of an industry, working as a project leader on applied research, medical physics engineer in a hospital. Their teamwork skills and knowledge of biomedical engineering make them suitable for hospital or clinical engineers who support and improve patient care by applying engineering and management skills to health care technology. They are involved in technical support of daily practice, training of health care professionals, introducing safety programmes, etc. The broad view on the various BME-fields, the capability in making judgements, integrating medical, cultural, social, ethical insights make them very well suited for functions in government/public health, consultancy in a wide spectrum of functions (from product design to safety regulations), notified bodies (screening new products for a CE-mark), health insurance, improving

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health care and controlling costs.

