

## Course Descriptions Bachelor 2021-2022

Course Title Fundamentals of Engineering  
 Course Code BENC1003  
 ECTS Credits 5,0  
 Assessment Whole/Half Grades

Period	Start	End	Mon	Tue	Wed	Thu	Fri
2	25-10-2021	10-12-2021	X		X		L

Level no level

Coordinator Bart van Grinsven, Gabriëlle Tuijthof For more information: bart.vangrinsven@maastrichtuniversity.nl; gabrielle.tuijthof@maastrichtuniversity.nl

Language of instruction English

Goals

1. Reproduce knowledge on the generic engineering design cycle and describing functional elements in devices, systems, products.
2. Understand, explain and use basic engineering principles and recognition of orders of magnitude.
3. Perform elementary modelling and basic calculations on mechanics, energy, electricity, fluids and heat transfer.
4. Define an engineering problem and explain the relationship with business processes both in written text and via graphic schemes.
5. Demonstrate understanding of engineering problems related to their societal and regional context to detect the most viable by searching and studying additional literature.
6. Adapt to new and emerging technologies and recognize innovative elements in a design.

Description This course introduces the fundamentals of engineering. It provides an overview of the various engineering fields, which are covered in the Business Engineering programme, such as systems engineering, electrical engineering, mechanical engineering, transport phenomena (heat and fluid), sensor and optical engineering with a specific focus on the open-ended and multidisciplinary nature of typical engineering problems and the underlying scientific principles. The students familiarize with the engineering design cycle, which consists of formulating a problem, setting design requirements, generating several concepts, selecting the optimal solution and realizing it. Upon completion, students will be able to identify and explain the elementary process steps in scientific instrumentation design, modelling and engineering. Special attention is paid to the underlying scientific principles and laws of the mentioned engineering fields as well as the elementary modelling steps of engineering systems. The course prepares students for later courses in which they continue the development of their engineering skills to assist selection of appropriate materials for a design and accompanying make production process decisions. In this light, students need to perform this with an understanding of the business and financial impact, but also the academic environment as well as ethics, safety and sustainability aspects. Finally, the course explains the transdisciplinary role of engineers in a rapidly changing globalising world.

Teaching methods:

The course follows the problem-based learning approach with a company visit, 6 lectures, 6 tutorials and 6 workshops.

Assessment methods:

Team report made according to a predefined format (30% of the final grade) and final individual exam consisting of multiple choice and open-ended questions (70% of the final grade).

Literature \* Moaveni S. (2020). Engineering Fundamentals: An Introduction to Engineering, SI Edition. Cengage Learning, 6th edition, ISBN 978-1-4390-6208-1

\* Khandani S (2005), Engineering design process. View date: 1-5-2019

Prerequisites No prerequisites are required.

Keywords Engineering, modelling, calculations, unities, design

Teaching methods PBL / Lecture

Assessment methods Written Exam

Evaluation in previous academic year For the complete evaluation of this course please click <http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM>

This course belongs to the following programme / specialisation

Bachelor Business Engineering

Year 1 Compulsory Course(s)