Course Descriptions None 2022-2023

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

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
2	31-10-2022	16-12-2022	X		X		L

Level	no level
Coordinator	Iwan de Jong, Marike Hendriks For more information:iwan.dejong@maastrichtuniversity.nl; marike.hendriks@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	PLEASE NOTE THAT THE INFORMATION ABOUT THE TEACHING AND ASSESSMENT METHOD(S) USED IN THIS COURSE IS WITH RESERVATION. A RE-EMERGENCE OF THE CORONAVIRUS AND NEW COUNTERMEASURES BY THE DUTCH GOVERNMENT MIGHT FORCE COORDINATORS TO CHANGE THE TEACHING AND ASSESSMENT METHODS USED. THE MOST UP-TO-DATE INFORMATION ABOUT THE TEACHING/ASSESSMENT METHOD(S) WILL BE AVAILABLE IN THE COURSE SYLLABUS. 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)