Course Descriptions None 2020-2021

Course Title	Materials Engineering
Course Code	BENC1007
ECTS Credits	5,0
Assessment	Whole/Half Grades

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
5	12-4-2021	28-5-2021	X		X		

Level	no level
Coordinator	Elizabeth Rosado Balmayor For more information:e.rosadobalmayor@maastrichtuniversity.nl
Language of instruction	English
Goals	The aim of the course is to instruct students in the fundamentals of materials science and engineering. The students will gain a better understanding of engineering and how it impacts our daily lives in various ways.
Description	PLEASE NOTE THAT THE INFORMATION ABOUT THE TEACHING AND ASSESSMENT METHOD(S) USED IN THIS COURSE IS WITH RESERVATION. THE INFORMATION PROVIDED HERE IS BASED ON THE COURSE SETUP PRIOR TO THE CORONAVIRUS CRISIS. AS A CONSEQUENCE OF THE CRISIS, COURSE COORDINATORS MAY BE FORCED 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 will cover 6 learning objectives: 1. Gain knowledge of materials classification and properties, of engineering, production and characterization methods as well as of various application areas 2. Understand the relationship between the production of materials for different applications and the business processes needed to support the production 3. Analyze a materials engineering problem and assess which expertise, materials, laboratory infrastructure and experiments are required to investigate and solve this problem in an efficient manner through scientific research 4. Understand the complexity of the process of selecting, designing, producing and applying a material for an intended application 5. Understand the global developments of the production process of materials 6. Develop scientific knowledge in the field of materials engineering through study To achieve these learning objectives, it is important to start this course with the understanding of the atomic structure and interatomic bonding in materials, because they form the basis for the classification of materials and for understanding of their properties. Different material classes (metals, ceramics, polymers, composites) will be studied and a large number of properties, including magnetic, electrical, thermal, optical, as well as mechanical properties will be thoroughly investigated for the different types of materials. Based on the gained theoretical knowledge students will be taught how to select the optimal material for a certain application and how these applications will impact businesses. The course follows the problem-based learning (PBL) approach. Characteristic of this approach is that learning is the result of an engaged interaction between academic staff and students, fueled by their experience and knowledge, with the objective of developing understanding and insights. Next to tutorial sessions, the course prepares for other Engineering courses and the projects in the curriculum. The course is structured including lectures, tutorials and a lab session (experimental). The assessment of the course has three components. 1. Team report on a selected materials engineering topic (free to choose) 2. Lab report on the exercises done in the lab 3. Final examination (individual written exam), which consists of open questions and problems Attendance of all tutorial meetings and the lectures is required.
Literature	* Materials Science and Engineering: An Introduction, 10th Edition, William D. Callister Jr., David G. Rethwisch, ISBN: 978-1-119-40549-8, January 2018
Prerequisites	* To be a student enrolled in the BSc Business Engineering programme. * To have passed the courses Introduction to Business Engineering (Y1/P1) and Fundamentals of Engineering (Y1/P2) * To be sufficient in English language (teaching and examinations will be conducted in English).
Keywords	Materials, Metals, Ceramics, Polymers, Composite materials, Material structure and properties, Fabrication, Characterization, Applications
Teaching methods	PBL / Lecture / Papers / Research
Assessment methods	Written Exam / Assignment
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)