unibz
Fakultät für Ingenieurwesen
Facoltà di Ingegneria
Faculty of Engineering

COURSE DESCRIPTION – ACADEMIC YEAR 2024/2025

Course title	**Material Sciences for energy efficiency**
Course code	42619
Scientific sector	ING-IND/22
Degree	Professional Bachelor in Wood Technology (LP-03)
Semester	1
Year	2
Credits	3
Modular	No

Total lecturing hours	30
Total lab hours	-
Attendance	Attendance is not compulsory but highly recommended.
Prerequisites	-
Course page	Microsoft Teams and https://ole.unibz.it/

Specific educational objectives	The course gives a general overview of scientific contents related to science of materials with a specific focus on the energy efficiency. The aim of the course is to acquire the knowledge of the properties and characteristics of materials. The building materials will be dealt with are: metals and metal alloys, ceramics, polymers and glass. The mechanical and thermal behavior of these materials will be analyzed, and the different properties of similar materials will be compared. This is the basic knowledge that will consent in the Material Sciences for energy efficiency Lab to choose the proper material according to the specific need.

Lecturer	Chiara Tardini
Contact	chiara.tardini@unibz.it
Scientific sector of lecturer	
Teaching language	English
Office hours	Thursday 16:30 - 17:30, or arrange beforehand by email.
Lecturing Assistant (if any)	-
Contact LA	
Office hours LA	
List of topics	Mechanical behaviour and thermal properties of: • Metals and metals alloy • Reinforced concrete • Ceramics • Glass • Polymers and natural insulation materials
Teaching format	Frontal lectures, Seminars

Learning outcomes	Knowledge and understanding: • D1.1 – Knowledge of the key concepts and technologies of building materials

	• D1.2 – Understanding of the skills, tools and techniques required for an energy effective use of building materials. Applying knowledge and understanding: • D2.1 – to find the proper solution to simple exercises to test the knowledge of the content of the course. Making judgments • D3.1 – Ability to autonomously select the most proper material according to the specific energy saving need. Communication skills • D4.1 – Ability to use English at an advanced level with particular reference to disciplinary terminology. Learning skills • D5.1 – Ability to deal with problems in a systematic and creative way and to appropriate problem-solving techniques.

Assessment	• Written and oral exam: written exam to test knowledge application skills and oral exam with verification questions.
Assessment language	English
Assessment Typology	Monocratic
Evaluation criteria and criteria for awarding marks	Written exam weighs 60% and oral weighs 40% of the final mark. Students are admitted to the written exam only if the project carried out in the Lab course is positively assessed. • relevant for the assessment of written exam: clarity of answers, knowledge of topics analyzed throughout the course, • relevant for the assessment of the oral exam: skills in critical thinking, evaluate, and establish relationships between topics. Same evaluation criteria for non-attending students.

Required readings	Callister W., Rethwisch D.G., *Materials Science and Engineering*, Wiley & Son
Supplementary readings	
Software used	-