Syllabus

Descrizione corso

Titolo insegnamento	Laboratorio di efficienza energetica nella produzione e usi del legno
Codice insegnamento	42627
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	NN
Lingua	Inglese
Corso di Studio	Corso di laurea professionalizzante in Tecnologie del Legno
Altri Corsi di Studio (mutuati)	
Docenti	dott. Maja Danovska, Maja.Danovska@unibz.it
Assistente	
Semestre	Primo semestre
Anno/i di corso	3
CFU	2
Ore didattica frontale	20
Ore di laboratorio	0
Ore di studio individuale	30
Ore di ricevimento previste	6
Sintesi contenuti	• Energy Efficiency in Thermo-Chemical Conversion of Wood. • Characterization of Wood-Based Biomass. • Thermo-Chemical Conversion Processes. • Performance and Efficiency of Real Biomass Energy Systems. • Laboratory Instrumentation and Data Interpretation.
Argomenti dell'insegnamento	The laboratory course will cover the following topics: • Energy Efficiency in Thermo-Chemical Conversion of Wood. • Characterization of Wood-Based Biomass. • Thermo-Chemical Conversion Processes. • Performance and Efficiency of Real Biomass Energy Systems.

	• Laboratory Instrumentation and Data Interpretation.
Parole chiave	Wood characterization, laboratory, data analysis, conversion processes, real biomass energy systems.
Prerequisiti	None.
Insegnamenti propedeutici	
Modalità di insegnamento	Practical lecture mainly inside the laboratory. Discussion of a real study case to be analysed under different scenarios. Teaching material and additional materials will be provided during the semester.
Obbligo di frequenza	Not compulsory
Obiettivi formativi specifici e risultati di apprendimento attesi	The present laboratory deals with the practical aspects of energy efficiency with a special focus on the wood engineering sector. The course consists of 20 hours of practical activities carried out mainly through laboratory activities consisting in the: • Analysis the energy efficiency of processes involved thermo-chemical conversion of wood. • Characterization of wood-based biomass through laboratory analysis of properties such as moisture content, calorific value, and elemental composition. • Investigation of the thermo-chemical conversion processes (combustion, pyrolysis, gasification) through laboratory experiments. • Understanding the performance and efficiency of real biomass energy systems through both the analysis of real study cases under different scenarios and the visits to full-scale facilities/plants. • Development of technical skills in operating laboratory instruments and interpreting results for biomass energy applications, as well as applying theoretical concepts to practical and real examples. The learning outcomes need to refer to the Dublin Descriptors: 1. Knowledge and Understanding Demonstrate comprehensive knowledge of the principles of energy efficiency, thermo-chemical conversion processes, and sustainability within the wood industry and biomass energy systems. 2. Applying Knowledge and Understanding Apply theoretical and practical knowledge to analyze and solve

	problems related to energy efficiency in wood biomass conversion and to design or propose improvement projects for energy systems. 3. Making Judgements Exercise autonomous judgement in evaluating energy scenarios and performance of biomass conversion systems; critically assess data from laboratory experiments and real facilities to recommend effective energy efficiency strategies in the wood sector. 4. Communication Skills Effectively communicate technical concepts, experimental results, and improvement proposals both verbally and in writing, including the clear presentation of numerical analyses related to energy systems in wood production and biomass conversion. 5. Ability to Learn Develop lifelong learning skills to acquire advanced knowledge and practical tools in energy efficiency, sustainability, and circular economy principles applicable not only to the wood industry but also to broader industrial and environmental contexts.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	Development and Discussion of a Project Work. Students are either marked Passed or Failed. Attendance is strongly recommended.
Criteri di valutazione	The Passed or Failed assessment will be based on the ability to develop energy efficiency and sustainability solutions for real case studies, as well as the effectiveness of topic presentation.
Bibliografia obbligatoria	Çengel, Y. A., & Boles, M. A. (2021). Thermodynamics: An engineering approach (9th ed.). McGraw-Hill Education. Çengel, Y. A., & Ghajar, A. J. (2020). Heat and mass transfer: Fundamentals and applications (6th ed.). McGraw-Hill Education.
Bibliografia facoltativa	Learning material will be provided by the professor during the course.
Altre informazioni	Software used: in case, information will be provided at the beginning of the course.

Obiettivi di Sviluppo Sostenibile (SDGs)	Innovazione e infrastrutture, Energia rinnovabile e accessibile