Syllabus

Descrizione corso

Titolo insegnamento	Laboratorio di Edilizia ad alte prestazioni: comfort, efficienza energetica
Codice insegnamento	42642
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	prof. Giovanni Pernigotto, Giovanni.Pernigotto@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/30622 dr. Federica Morandi, Federica.Morandi@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/41968
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	
Sintesi contenuti	• Knowledge of instruments and tools to characterize the thermal behaviour of building materials and building envelope elements. • Knowledge of instruments to monitor Indoor Environmental Quality. • Calculation tools to assess the thermal behaviour of building

	envelope element and connection nodes • Calculation tools to assess the energy performance of the whole building system, specific HVAC subsystems and artificial lighting systems.
Argomenti dell'insegnamento	The present laboratory deals with the practical aspects of the design of high-performance buildings. It consists of 20 hours of practical activities carried out both in the Laboratories of Building Physics of the Free University of Bozen-Bolzano at the NOI Techpark and in university classrooms (exercises, computer modelling and energy simulations). Laboratory activities will be related to: - Characterization of the thermo-physical properties of building materials. - Measurement of heat flux through building envelope elements. - Characterization of Indoor Environmental Quality through the use of different monitoring instruments. Exercise activities will be related to: - Calculation of thermos-hygrometric and energy performance of building elements (windows, walls) and connection nodes (thermal bridges). - Calculation of the energy performance of case-study building envelope configurations. - Calculation of the energy performance of case-study building HVAC configurations / artificial lighting systems.
Parole chiave	building energy performance; indoor environmental quality; heat flux measurement; temperature measurement
Prerequisiti	Heat and mass transfer (preferably).
Insegnamenti propedeutici	
Modalità di insegnamento	Practical lectures in the Building Physics Labs and exercise lectures in the classroom. Teaching material and additional materials will be provided during the semester.
Obbligo di frequenza	Strongly recommended.
Obiettivi formativi specifici e risultati di apprendimento attesi	The present laboratory deals with the practical aspects of the design of high-performance buildings. It consists of 20 hours of practical activities carried out both in the Laboratories of Building Physics of the Free University of Bozen-Bolzano at the NOI Techpark and in university classrooms (exercises, computer modelling and energy simulations).

	Laboratory activities will be related to: - Characterization of the thermo-physical properties of building materials. - Measurement of heat flux through building envelope elements. - Characterization of Indoor Environmental Quality through the use of different monitoring instruments. Exercise activities will be related to: - Calculation of thermos-hygrometric and energy performance of building elements (windows, walls) and connection nodes (thermal bridges). - Calculation of the energy performance of case-study building envelope configurations. - Calculation of the energy performance of case-study building HVAC configurations / artificial lighting systems. Intended Learning Outcomes (ILO): Knowledge and understanding 1. Knowledge of the calculation methods described by the current technical standards for building energy performance assessment. Knowledge of the laws currently in force regarding building energy efficiency and requirements. Applying knowledge and understanding 2. Capability to implement the procedures described by the technical standards; capability to develop design and diagnostic skills related to energy efficiency, comfort, and indoor lighting; capability to improve the energy performance of a real case-study. Making judgements 3. The student will be able to assess the energy performance of both existing and new buildings, to identify the critical aspects and suggest improvement solutions. Communication skills 4. The student will be able to discuss the learned knowledge with vocabulary and technical terms of the discipline. Ability to learn 5. Lifelong learning capability through the acquisition of critical tools and critical evaluation of product specifications.

Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	No exam is required. Students are either marked as "Passed" or "Failed". Attendance is strongly recommended, even if it is not mandatory.
Criteri di valutazione	No exam is required. Students are either marked as "Passed" or "Failed". Attendance is strongly recommended, even if it is not mandatory.
Bibliografia obbligatoria	Lessons and slides of the course
Bibliografia facoltativa	Technical standards and, in particular: - UNI EN ISO 6946:2018 - UNI EN ISO 52016-1:2018 - UNI/TS 11300-1:2014 - UNI EN ISO 10211:2018 - UNI EN ISO 10077-1:2018 and -2:2018 - EN 16798-1:2019 - EN 12464-1:2021
Altre informazioni	Software used: Main tools used during the course: • Berkeley Lab THERM (freeware, https://windows.lbl.gov/therm-software-downloads) • Berkeley Lab WINDOW (freeware, https://windows.lbl.gov/window-software-downloads) • DIALux evo (freeware, https://www.dialux.com/en-GB/dialux)
Obiettivi di Sviluppo Sostenibile (SDGs)	Buona salute, Città e comunità sostenibili, Energia rinnovabile e accessibile