Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus

Kursbeschreibung

Titel der Lehrveranstaltung	Labor für Hochleistungs-Gebäude: Komfort und Energieeffizienz
Code der Lehrveranstaltung	42642
Zusätzlicher Titel der Lehrveranstaltung	
Wissenschaftlich-disziplinärer Bereich	NN
Sprache	Englisch
Studiengang	Berufsbildender Bachelor in Holztechnik
Andere Studiengänge (gem. Lehrveranstaltung)	
Dozenten/Dozentinnen	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
Wissensch. Mitarbeiter/Mitarbeiterin	
Semester	Erstes Semester
Studienjahr/e	3
KP	2
Vorlesungsstunden	20
Laboratoriumsstunden	0
Stunden für individuelles Studium	30
Vorgesehene Sprechzeiten	
Inhaltsangabe	• 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.
Themen der Lehrveranstaltung	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.
Stichwörter	building energy performance; indoor environmental quality; heat flux measurement; temperature measurement
Empfohlene Voraussetzungen	Heat and mass transfer (preferably).
Propädeutische Lehrveranstaltungen	
Unterrichtsform	Practical lectures in the Building Physics Labs and exercise lectures in the classroom. Teaching material and additional materials will be provided during the semester.
Anwesenheitspflicht	Strongly recommended.
Spezifische Bildungsziele und erwartete	The present laboratory deals with the practical aspects of the design of high-performance buildings. It consists of 20 hours of

Lernergebnisse	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.
Spezifisches Bildungsziel und erwartete Lernergebnisse (zusätzliche Informationen)	
Art der Prüfung	No exam is required. Students are either marked as "Passed" or "Failed". Attendance is strongly recommended, even if it is not mandatory.
Bewertungskriterien	No exam is required. Students are either marked as "Passed" or "Failed". Attendance is strongly recommended, even if it is not mandatory.
Pflichtliteratur	Lessons and slides of the course
Weiterführende Literatur	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
Weitere Informationen	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)
Ziele für nachhaltige Entwicklung (SDGs)	Gesundheit und Wohlergehen, Nachhaltige Städte und Gemeinden, Bezahlbare und saubere Energie