

Syllabus

Course description

Course title	Heat and mass transfer
Course code	42309
Scientific sector	ING-IND/10
Degree	Bachelor in Wood Engineering
Semester	I
Year	II
Academic Year	2022-23
Credits	6
Modular	no

Total lecturing hours	36
Total lab hours	
Total exercise hours	24
Attendance	Not compulsory but recommended
Prerequisites	availability of standards under "compulsory readings" during the lectures
Course page	https://www.unibz.it/de/faculties/sciencetechnology/bachelor-wood-engineering/courses-offered/?academicYear=2020

Specific educational objectives	Knowing, understanding, calculating and being able to evaluate the principles and processes of heat and mass transfer, especially for application in timber building materials, components and buildings. The practically required correlations for the thermal-acoustic-energy evaluation of building materials, component structures and buildings are taught, as well as the physical processes behind them. The physical principles taught are also fundamental for understanding the corresponding production processes (physical processes in processing, manufacturing and automation).
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Lecturer	Dr. Marco Caniato
Scientific sector of the lecturer	building physics, heat and mass transport, civil engineering
Teaching language	English
Office hours	Wednesday 17-19
Teaching assistant (if any)	---
Office hours	---
List of topics covered	<p>Opaque and transparent building envelope</p> <p>Thermal bridges</p> <p>Technical standards and norms</p> <p>measurements and test methods</p> <p>Thermal and acoustic building physics</p> <p>Calculation and verification methods</p>

	as well as the relevant parameters (including component structure, heat transport, heat loss, surface temperature, mould prevention, diffusion, energy and energy efficiency) Timber mechanical, thermal and acoustic properties in its various components (solid, composite, recycled, fiber etc).
Teaching format	lecture; examples and exercised; presentation of models.

Learning outcomes (ILOs)	<p>The learning outcomes need to refer to the Dublin Descriptors:</p> <p><u>Knowledge and understanding</u></p> <p>1. the students have developed and have demonstrated knowledge and understanding of physical processes in materials and building components with respect to heat and mass transfer. This includes the relevant rules and calculations for heat transport, energy efficiency in buildings, acoustic, moisture protection in building materials, building components and buildings.</p> <p><u>Applying knowledge and understanding</u></p> <p>2. the students can apply their knowledge and understanding professionally, and can solve problems and questions regarding heat and mass transport and energy efficiency.</p> <p><u>Making judgements</u></p> <p>3. the students have the ability to gather and interpret relevant data (thermal and hygric parameters of materials, building components and building materials; climatic data) and rate the performance of the material or the component or building accordingly and against current benchmarks.</p> <p><u>Communication skills</u></p> <p>4. the students can communicate the principles of heat and mass transfer, and their application in buildings, to both specialist and non-specialist audiences</p> <p><u>Ability to learn</u></p> <p>5. the students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy.</p>
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Assessment	Formative assessment		
	Form	Length /duration	ILOs assessed
	Oral or written test	ca. 1 hour	1, 2, 3, (4)

	<p>Summative assessment</p> <table border="1"> <thead> <tr> <th>Form</th> <th>%</th> <th>Length /duration</th> <th>ILOs assessed</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Form	%	Length /duration	ILOs assessed								
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Assessment language	English												
Evaluation criteria and criteria for awarding marks	<p>Knowledge and understanding of physical processes and relevant calculations.</p> <p>Judgement of performance of materials and components.</p> <p>Identification and discussion of problem-solving and improvement techniques.</p> <p>Knowledge of relevant standards.</p>												
Required readings	Teaching material, handouts, videos provided by the teacher												
Supplementary readings	<p>Yunus A. Cengel, Heat Transfer: A Practical Approach, McGraw-Hill Education, 2002</p> <p>T.L. Bergman, A.S. Lavine, Fundamentals of heat and mass transfer, Wiley and Sons</p> <p>F. Alton Everest, K.C. Pohlmann – Master Handbook of acoustics, Sixth Edition, 2014, Mc. Graw - Hill</p>												