Universität Stuttgart
Institute of Construction Materials (IWB)
Materials Testing Institute (MPA)

Wood Physics

Description

Contact person:
Jun.-Prof. Dr. Philippe Grönquist
Pfaffenwaldring 4b, 70569 Stuttgart
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ECTS points: 3
Lecture language: English

Target study programmes:

- M.Sc. Civil Engineering
- M.Sc. Real Estate Engineering and Management
- M.Sc. Computational Mechanics of Materials and Structures
- M.Sc. Integrative Technologies & Architectural Design Research

Wood represents one of mankind's most important materials. Currently, it's significance is increasing thanks benefits such as its inherent sustainable nature as a construction material. This module aims at providing basic knowledge on the physical properties of wood. A focus is laid on the relationships between wood structure and resulting mechanical and physical properties across hierarchical levels. A further focus is laid on the modelling of physical, especially mechanical, properties of wood. Knowledge will be gained about commonly used wood species used in timber construction in Europe. In addition, insight in current research in the field of wood science and technology will be provided. Participants will establish an awareness of a material-appropriate usage of wood in construction regarding its physical properties, and be be able to critically reflect thereupon. This course represent a solid but facultative basis for the subsequent summer semester course "**Engineered Wood Products**".

[Image: P. Grönquist, IWB/MPA University of Stuttgart, 2022. Modified from M. Harrington and J.J. Harrington]

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Lecture plan
Winter semester 2023/24

M.Sc. Civil Engineering
M.Sc. Real Estate Engineering and Management
M.Sc. Computational Mechanics of Materials and Structures
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Lecture day:	Thursday
Time:	15:45–17:15 pm
Location:	PWR 05C – V 5.03
Period:	19.10.2023 – 08.02.2024
Material:	Provided on ILIAS upon C@mpus registration

Date	Agenda	Lecturer
19.10.2023	Introduction & the resource wood	P. Grönquist
26.10.2023	Wood structure and anatomy I	P. Grönquist
02.11.2023	Wood structure and anatomy II	P. Grönquist
09.11.2023	Tree biomechanics	P. Grönquist
16.11.2023	No lecture (pause)	-
23.11.2023	Wood density	P. Grönquist
30.11.2023	No lecture (pause)	-
07.12.2023	Wood-water interaction I: Wood moisture	P. Grönquist
14.12.2023	Wood-water interaction II: Swelling and shrinkage	P. Grönquist
21.12.2023	Thermal and electrical properties	P. Grönquist
11.01.2024	Mechanics I: Elasticity	P. Grönquist
18.01.2024	Mechanics II: Strength	P. Grönquist
25.01.2024	Mechanics III: Rheological behavior	P. Grönquist
01.02.2024	Mechanics IV: Micromechanics	P. Grönquist
08.02.2024	Recap and exam preparation	P. Grönquist