MSE-466

Wood structures, properties and uses

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Cursus	Sem.	Type
Materials Science and Engineering	MA2, MA4	Opt.

Language of teaching	English
Credits	2
Session	Summer
Semester	Spring
Exam	Written
Workload	60h
Weeks	14
Hours	**2 weekly**
Lecture	2 weekly
Number of positions	

Summary

The presentation of tree growth and formation of wood anatomical structures, linked to the description of specific physical and mechanical properties, makes it possible to understand the different forms of utilisation of this material, including aspects of sustainable development

Content

- Overview of forest management in function of the tree species and concept of sustainable development (specific to forestry and in the actual broad sense)
- Biology of wood formation
- Physiology and Chemistry of wood
- Microscopic and macroscopic structures of the main softwood and hardwood species (identification tests)
- Biological, physical and mechanical prop. of woods
- Forms of uses in function to the properties
- Modern wood-based materials and their applications
- Life cycle assessments and potentials for sustainability.

Keywords

Trees/Wood/Anatomy/Structures/Properties/Utilisations

Learning Prerequisites

Required courses

General knowledge in material science

Recommended courses

Building materials, structures, properties

Important concepts to start the course

General notions of ecology

Learning Outcomes

By the end of the course, the student must be able to:

- Explain the different services provided by the forests
- Describe the wood anatomical structure of the main species
- Interpret the wood properties as a function of its structure
- Sketch the forms of utilisation of timbers as a fonction of their properties
- Characterize the relationship between species, structures, properties and uses
- Identify with a hand lens the 10 main species of Central Europe

Transversal skills

- Take responsibility for environmental impacts of her/ his actions and decisions.
- Access and evaluate appropriate sources of information.
- Make an oral presentation.

Teaching methods

Frontal and student-centered t., insight in laboratory work, student presentations

Expected student activities

Presentation (general portrait) of a tree species, linked with a specific form of wood utilisation (teams of 2- 4 students)

Assessment methods

Oral : wood species presentation and specific wood technology topic
Written : wood identification test, knowledge of features and properties, and their correlations

Supervision

Office hours	Yes
Assistants	No
Forum	No

Resources

Bibliography

[see french version]

Ressources en bibliothèque

- Understanding Wood / Hoadley
- Comportement thermo-hydromécanique du bois / Navi

Notes/Handbook

A polycopy is distributed,
and a personal collection of small wood samples.

Prerequisite for

Professional activities (choice of materials in projects)