Wood material science

INTRODUCTION 10.1.2023

CHEM-E2225 5 cr

Aalto University
School of Chemical
Engineering

Welcome!

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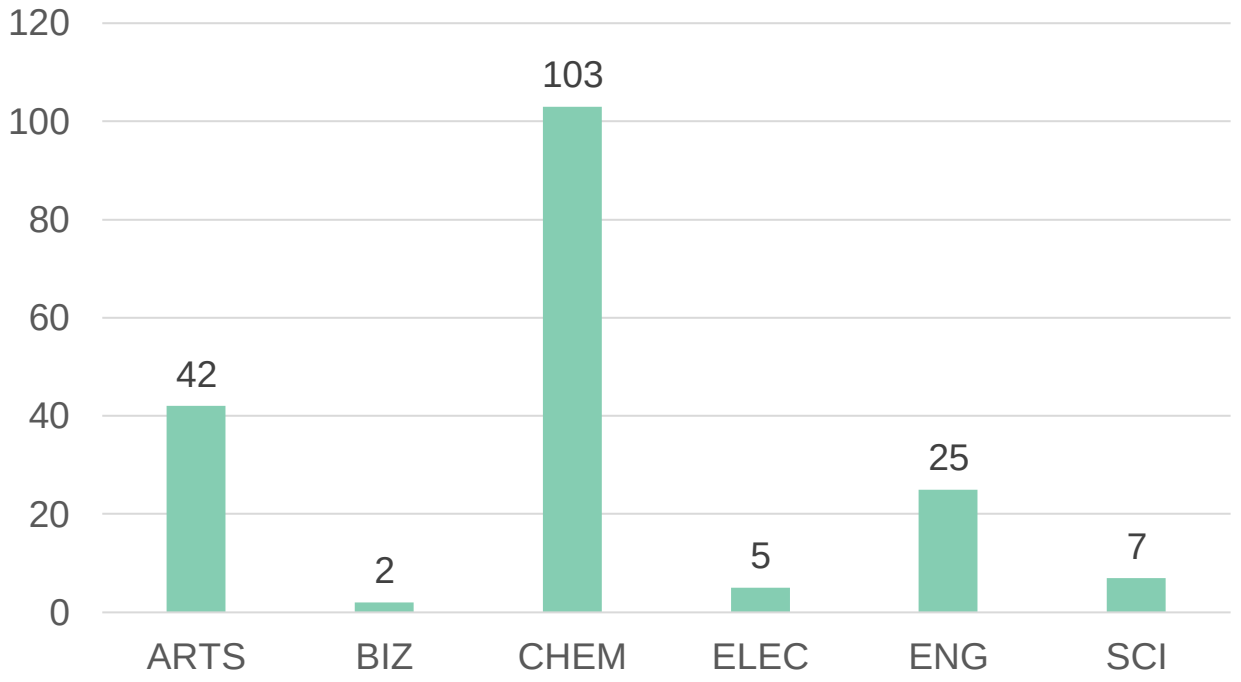
Students by department

9.1.2023

Altogether **184** students



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CHEM-E2225 / 5 CR

Wood material science

ONLINE course

- Students will learn about the formation and structure of wood, as well as its physical and mechanical properties.
- The course explains how the structure of wood affects its physical and mechanical properties, as well as describing factors that affects its durability.

10.1.–14.2.2023

For students in all fields
Proceed at own pace!
Registration in Sisu by 16.1.2023

Course description and registration in Sisu:

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After the course, students know…

- the **key anatomical features** of wood and can identify wood species from their microstructures
- the **anisotropic nature** of wood and be able to describe how the anatomical structure of wood **affects its physical and mechanical properties**.
- how **moisture** affects the mechanical and physical properties of wood
- anatomical factors influencing wood **density**
- some of the thermal, acoustic, electrical and combustion **properties** of wood
- the short-term and the long-term **mechanical behavior** of wood and how structure/anatomy, density and moisture affect these
- the key **degrading** organisms that are responsible for the breakdown of wood

How to pass the course?

Tue 10.1.2023 at 10:15 Introduction @Zoom

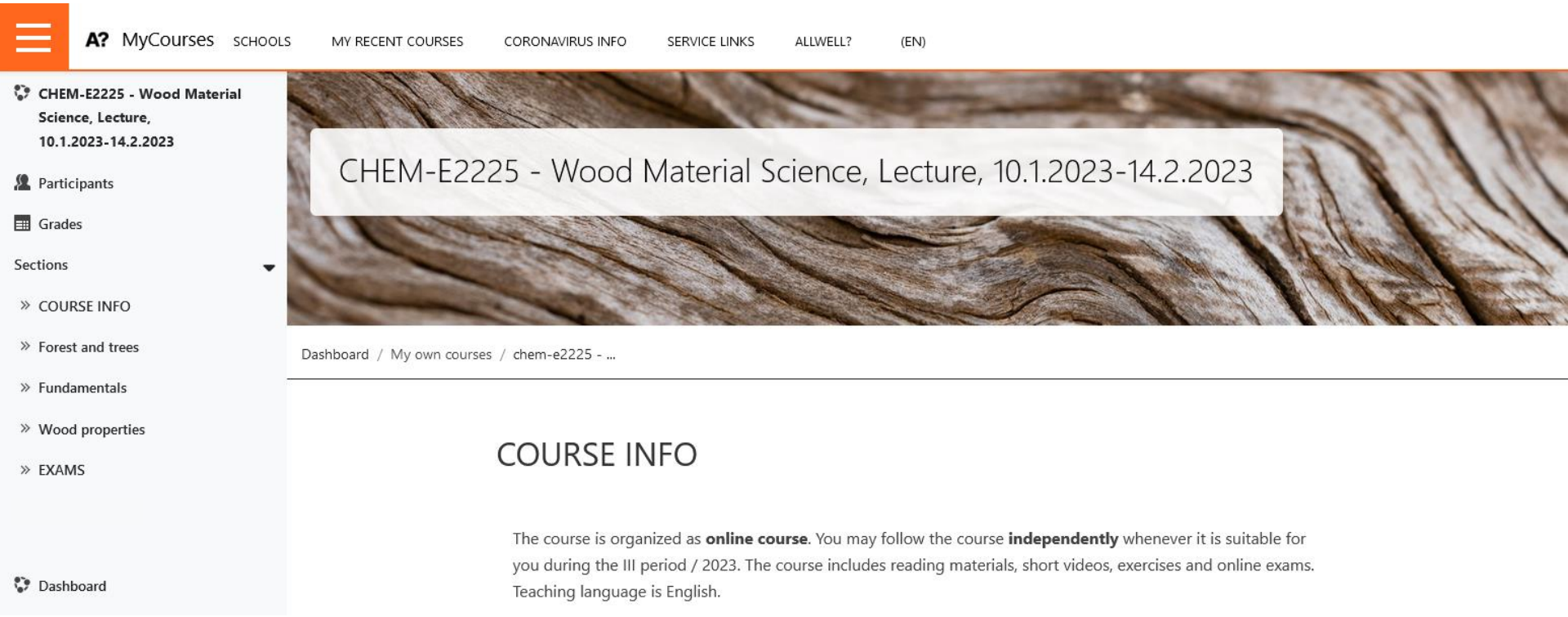
1. **Study the material at Aalto MyCourses workspace**
   - Practice with all the 10 online quizzes (100% correct)
2. **Do the 3 online exams in the workspace**
   - The exams you may do only once
3. **DL Sun 12.2.2023**
4. **Give feedback in MyCourses**

Tue 14.2.2023 at 10:15 Closing @Zoom

Participation to intro + closing sessions recommended (not compulsory)

→ Grading 0-5 (scale determined later)

Course info in MyCourses



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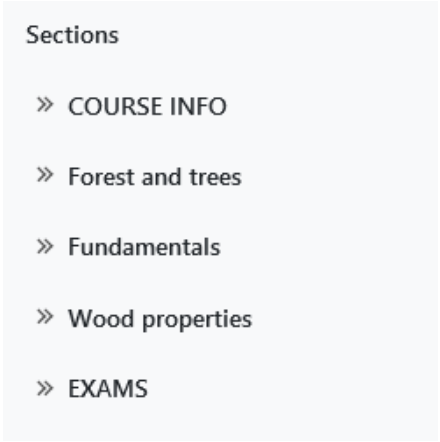
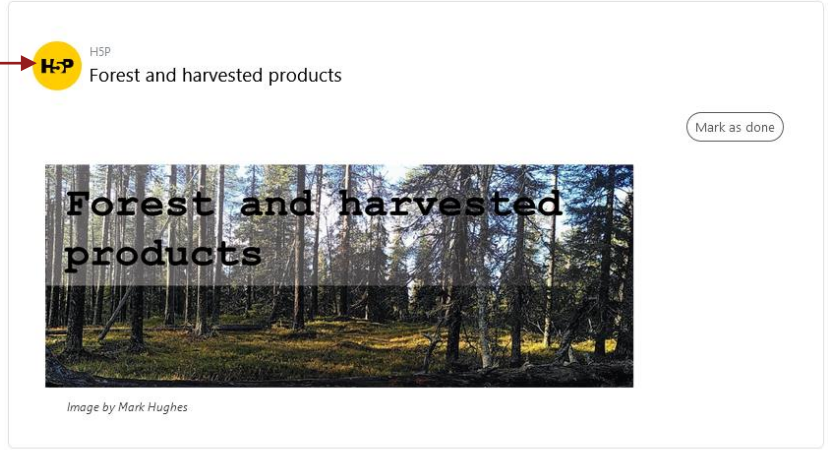
All materials in MyCourses



“Interactive book”

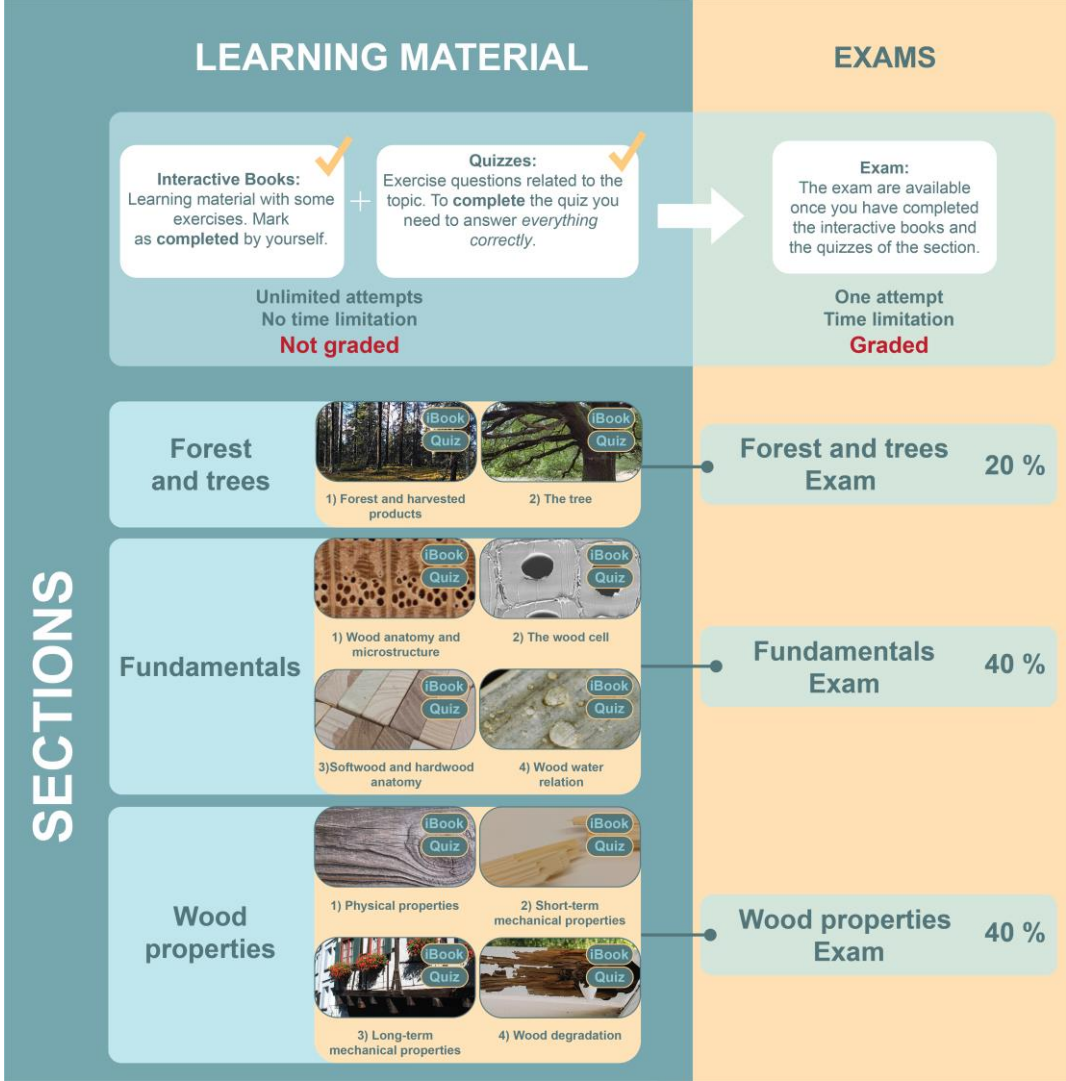


“Quiz”

100% correct
unlimited attempts

Plan ahead!

- DL 12th Feb (23:59)
- < 5 weeks, start today!
- Make your own schedule
- Don’t leave exams at the last minute!



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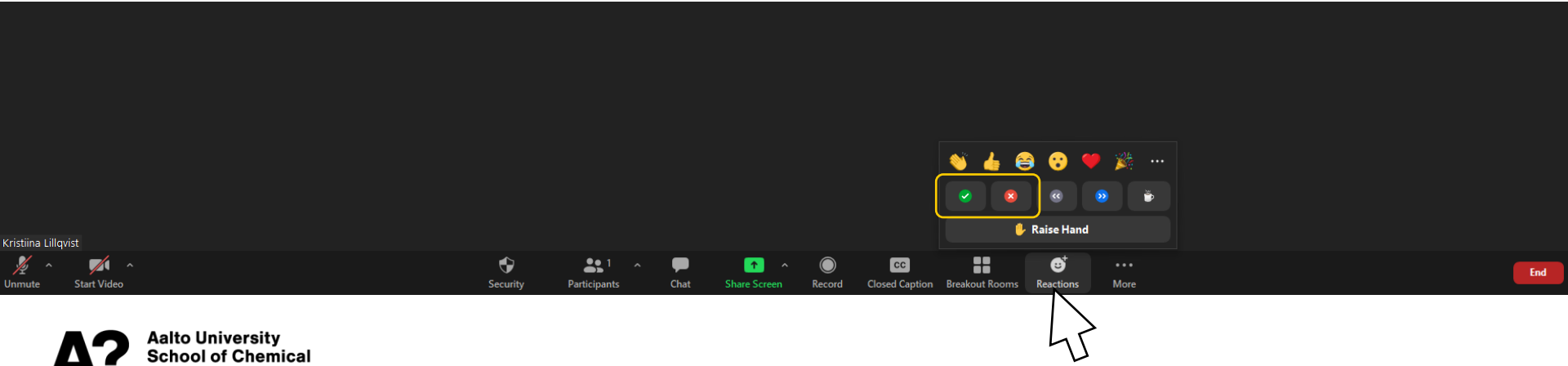
Yes / no questions!

- To start learning process
- Does not influence your grade
- Use yes / no –buttons in Zoom



Most of the cells in a growing tree are dead?

YES
Most of the cells are dead
Only the cambium layer and parenchyma cells in sapwood are alive

NO
Most of the cells are alive

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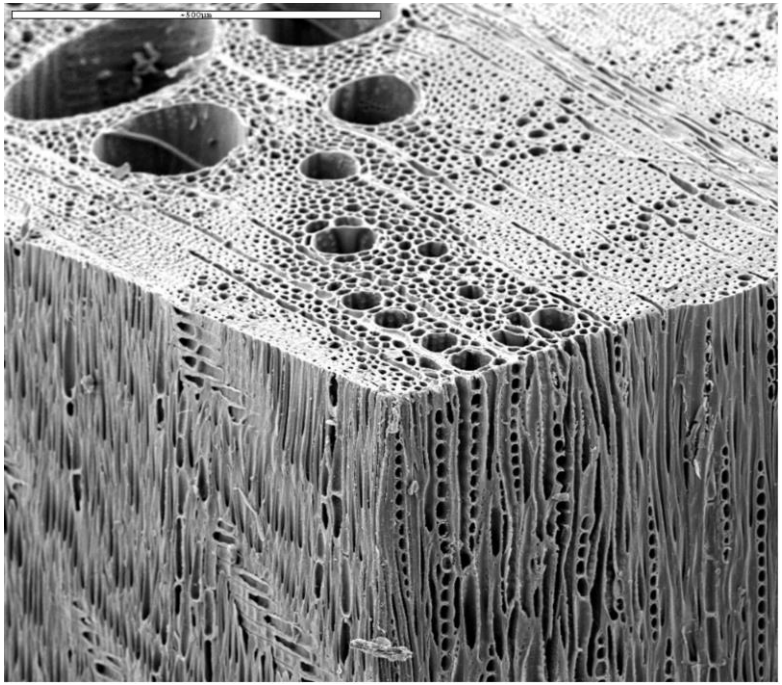
Picture: Daniela Altgen

Softwoods have a more complex cell structure than hardwoods?

YES
Sotwood cell structure is more complex.

NO
Hardwood cell structure is more complex.



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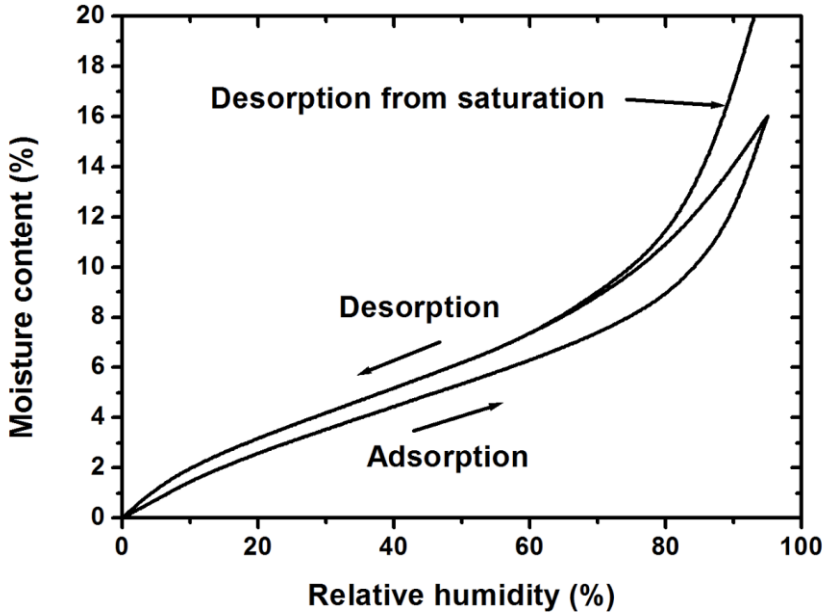
A wet wood sample and dry wood sample are brought to the same room condition. After some time, they will have the same moisture content?

YES
Moisture content is the same.

NO
Moisture content is different.



Thermal conductivity for concrete is about 1.7 (W/m.K). That of wood is lower?

YES
Wood thermal conductivity is lower

NO
Wood thermal conductivity is higher

Material	Thermal conductivity (W/m.K)
Air	0.024
Balsa (across the grain)	0.055
Wood perpendicular to grain (white pine)	0.12
Hardwood	0.16
Insulating materials	0.035 to 0.16
Epoxy	0.35
Brick	0.69
Concrete	1.7
Carbon steel	54
Copper	401

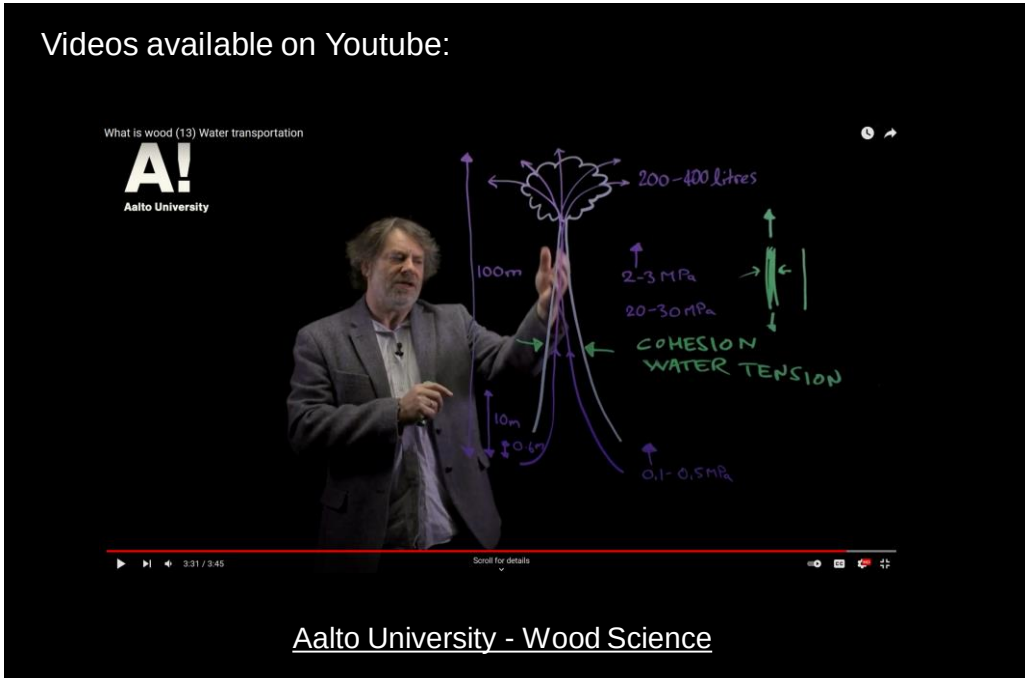
Source: https://www.engineeringtoolbox.com/thermal-conductivity-d_429.html

Questions / comments?

wood-teaching@aalto.fi

- Are you able to find MyCourses –page?
- Can you find and access the interactive books?

Videos available on Youtube:



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