

COURSE OUTLINE

1. GENERAL

INSTITUTION	University of Thessaly		
SCHOOL	School of Technology		
DEPARTMENT	Dept. of Forestry, Wood Sciences and Design		
LEVEL	Undergraduate		
CODE	KM341	STUDENT SEMESTER	3 nd
COURSE TITLE	Wood Properties		
ACTIVITIES		WEEKLY HRS	ECTS
	Lecture and Laboratory	2 + 1	5
TYPE OF COURSE	Scientific area		
PREREQUISITES:	None		
LANGUAGE TEACHING AND EXAMINATION:	Greek		
THE COURSE OFFERED TO STUDENTS ERASMUS	Not offered		
WEBPAGES COURSE (URL)	http://mantanis.users.uth.gr/Wood-properties.pdf		

2. LEARNING OUTCOMES

Learning Outcomes
<p>The aim of the course is the students to understand and receive fundamental knowledge on the physical, mechanical and biological properties of wood, as a material. Also, to get familiarized with the importance of these properties and their influence on the final uses of wood in practice.</p> <p>Additional important scope is to get to know basic information on the most critical wood properties, such as density, hygroscopicity, shrinkage & swelling, and the main mechanical properties like MOE, MOR, axial compression etc. In addition, to understand the term of natural durability of wood, as well as to know the basic biotic and abiotic "enemies" of wood in real life.</p>
General Skills
<p>Upon successful completion of this course, the students will be able to develop basic professional and social skills:</p> <ul style="list-style-type: none"> • Search, analysis and synthesis of data and information • Adaptation to new situations • Decision making • Autonomous work • Teamwork • Respect for the natural environment • Exercise criticism and self-criticism • Promoting free, creative and inductive thinking • Understanding technological developments and their implications • Development of professional mentality

3. COURSE CONTENT

<p>This course focuses on issues related to:</p> <ul style="list-style-type: none"> • Introduction - Wood as a renewable material
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- Advantages and disadvantages
- Wood density (oven-dry, basic, air-dry, etc.)
- Hygroscopicity of wood and ways it affects the usages
- Moisture content and methods for evaluation – Equilibrium moisture content (EMC)
- Shrinkage and swelling of wood – Approaches to increase dimensional stability
- Thermal properties of wood – The wood as an energy source
- Mechanical properties
- Bacteria, fungi and insects attacking wood – Weathering effects
- Natural durability of wood (importance, parameters, its influence in practice)

During the course, in addition to lectures:

- Written quizzes in the laboratory (formulas, types, etc.)
- Real laboratory tests are realised in the laboratory (e.g. mechanical tests, swelling tests etc.)
- Several laboratory exercises – estimations are carried out for self-criticism
- Homeworks are assigned every single week (e.g. problems to solve at home, several formulas, etc.)

Course lectures are supported by laboratory works, where each lab student-team (typically 15 students) is discussing their work and exercises in the laboratory, also solving several problems which are raised in the class, respecting the formula evaluations of properties, etc.

4. TEACHING AND LEARNING METHODS - EVALUATION

DELIVERY METHOD	Face to face The course is organized in two parallel streams: 1. Lectures, which analyze the concepts and methodologies that form the core of the course material. 2. Workshops (laboratory), where students get acquainted with methods and tools of the basic wood properties.	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of course websites both on UTH and also on the e-Class platform for posting (a) notes, (b) internet links, (c) announcements, search tools and other materials	
MANAGEMENT OF TEACHING	Activity	Semester Workload
	Lectures	20
	Individual homework	--
	Laboratory exercises	35
	Individual and work study for term assignment	70
	Term assignment presentation	--
	Course Total	125
STUDENT EVALUATION	Student assessment is largely based on the group work done by students, while the final grade takes into account: • the written final examination • the outcomes of the assigned homework	

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| | <ul style="list-style-type: none">• participation in laboratory courses• participation in course activities (e.g. tests, quizzes etc.) |
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5. RECOMMENDED BIBLIOGRAPHY

- ✚ Website: <http://mantanis.users.uth.gr/Wood-properties.pdf> (in Greek)
- ✚ Basic book: <http://mantanis.users.uth.gr/Idiotites-Xylou.pdf> (by George I. Mantanis)
- ✚ Birbilis, D. (2012). Wood Properties - laboratory notes: <http://mantanis.users.uth.gr/F-Idiotites-Xylou.pdf>
- ✚ Tsoumis, G. (2009). Science of Wood. A) Structure and properties. Gartagannis Publications, Thessaloniki, Greece.
- ✚ Website: www.wood-database.com
- ✚ Shmulsky, R., Jones, P.D. 2011. Forest Products and Wood Science: An introduction (6th edition). Wiley-Blackwell.
- ✚ Barnett, J.R., Jeronimidis, G. 2003. Wood Quality and its Biological Basis. Blackwell Publishing Ltd., Oxford, UK.
- ✚ Niemz, P., Mannes, D. 2012. Non-destructive testing of wood and wood-based materials. Journal of Cultural Heritage 13(3): S26–S34
- ✚ Rowell, R. (2005). Moisture Properties of Wood. In: Handbook of Wood Chemistry and Wood Composites. http://www.fpl.fs.fed.us/documnts/pdf2005/fpl_2005_rowell002.pdf
Moisture Relations & Physical Properties of Wood:
https://www.fpl.fs.fed.us/documnts/fplgtr/fplgtr190/chapter_04.pdf
- ✚ CIRAD (database); <https://tropix.cirad.fr/en/technical-sheets-available> (Technical Sheets)