LESSON DESCRIPTION

1. ΓΕΝΙΚΑ

Found.	Univ. of Thessaly		
FACULTY	TECHNOLOGY		
DEPT.	FORESTRY, WOOD SCIENCE AND DESIGN		
STUDY LEVEL	*Undergraduate*		
Lesson Code	ΞΣΥ 811	**Semester**	8th
LESSON TITLE	Technology of Timber Structures		

ACTIVITIES	**WEEKLY HRS**	**ECTS**
Theoretical	2	3
Excersise		
Laboratory	1	2
Total	**3**	**5**

TYPE OF COURSE	Scientific area
PREREQUISITES:	None
LANGUAGE TEACHING AND EXAMINATION:	Greek / English
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES
WEBPAGES COURSE (URL)	https://eclass.uth.gr/main/login_form.php?next=%2Fcourses%2FFWSD_U_113%2F

2. LEARNING OUTCOMES

Learning Outcomes

Aim of the course is for the students to get to know and fully engage with wooden constructions. In this lesson, they learn about wooden houses (made purely of wood or with wood as a supporting body), wooden roofs, the anti-seismic, energy characteristics of wooden houses. Also it concerns the types of wooden floors, frames and wooden stairs.

Upon successful completion of the course, the student will be able to:

- To know and control the products that are suitable for wooden constructions, in terms of type, quality, durability and moisture
- Distinguish the types of wooden houses and work on their production.
- To know the characteristics and construction methods of a wooden roof.
- To know the measures to protect wooden structures from fire, as well as the behavior of wooden buildings in an earthquake.
- To know types, characteristics and methods of installation, protection and maintenance of wooden floors.
- To know types, characteristics, production technology and methods of installation, protection and maintenance of wooden frames (doors and windows)
- To know types, characteristics, configuration rules, production technology and ways of installing wooden stairs.
- To know types, characteristics, particularities, ways of installing, protecting and maintaining wooden outdoor spaces.

• To have a comprehensive view of all the materials (wood or complementary) that he may use in constructions.

General Skills

- Search, analysis and synthesis of data and information, also using appropriate technologies in constructing wooden buildings and outdoor constructions
- Project planning and management
- Decision making
- Autonomous work
- Teamwork, coordination of actions
- Critical perception, flexibility of actions
- Promotion of free, creative and inductive thinking

3. COURSE CONTENT

In **theoretical** part of the course the student is taught and learns about:

- Basic principles governing structural constructions, especially those made of wood or wood products. Quality, moisture, timber certification. Wood species and products suitable for structural constructions. Differences between indoor and outdoor constructions.
- Construction of wooden houses: Log houses, houses with a light wooden frame, platform constructions - balloon type constructions, constructions with a reinforced wooden frame, constructions with a TFS (Truss Framed System) type frame, multi-storey buildings with a wooden frame, constructions with CLT, constructions with glue laminated timber and other composite wood products.
- Construction of a wooden roof, slope, roof characteristics, types of trusses – construction of trusses, thermal and moisture insulating properties, insulating materials, coating materials.
- Protection of wooden structures from fire.
- Behavior of wooden buildings in an earthquake.
- Wooden floors. Types, characteristics, production and installation technologies of floors. Wooden floors for special uses. Floor marking.
- Wooden frames. Traditional and modern types, characteristics, production and installation technologies for doors and windows. Marking of frames.
- Wooden stairs. Types, characteristics, design and safety rules, production and installation technologies.
- Outdoor wooden constructions. Construction types. Additional protective measures, impregnating substances, binders. Playground equipment, pergolas, canopies, ext. wooden floors, fences, wooden recreational forest structures, wooden bridges, wooden jetties. Agricultural wooden structures, storage areas, stables, animal farms.

The teacher in the 1st lesson gives a list of possible topics related to the subject matter of the course and the students are asked (optionally) to choose a topic for the work.

The course includes a **Laboratory** part.
In the laboratory part of the course, the student is taught and learns about:

- The utilization and the way of placing the basic materials in wooden constructions.
- The basic principles and ways of building wooden houses, especially houses with a light wooden frame.
- The basic principles and methods of construction of wooden roofs.
- The basic principles and methods of production and installation of wooden floors.
- The basic principles and methods of construction and installation of wooden frames.
- The basic principles and ways of building a wooden staircase.
- The basic principles and ways of building outdoor wooden constructions. The additional safety and maintenance measures required, depending on the type of construction.

Attending the laboratory part is mandatory for **80%** of the hours. Students in groups usually make 1-3 constructions. The oral or written support of the tasks and the satisfactory performance of the construction are elements of the laboratory evaluation.

4. TEACHING AND LEARNING METHODS-EVALUATION

DELIVERY METHOD	Combined application of educational methods and techniques in classroom and electronic platforms of teaching
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	• Use of a course website on the e-class platform for posting (a) lecture material, (b) notes and internet links, (c) announcements and search tools.
MANAGEMENT OF TEACHING	

Δραστηριότητα	***Φόρτος Εργασίας Εξαμήνου***
Lectures	20
Assignment presentation, focusing on case studies	6
Laboratory exercise	13
Excursion visits in construction fields	41
Individual and work study	45
Course Total	**125**

STUDENT EVALUATION	I. Final written test (70-100 %), with short questions on the theoretical part of the course, questions with multiple choices, etc II. Written either oral tests from laboratory exercises

5. RECOMMENDED BIBLIOGRAPHY

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- Αλεξανδρίδης Παναγιώτης, Ρυθμολογία και αρχιτεκτονική επίπλου, εκδ. Παπασωτηρίου, 1995
- Βακαλόπουλος Α., «ΙΣΤΟΡΙΑ ΤΗΣ ΜΑΚΕΔΟΝΙΑΣ 1354 – 1833» Θεσσαλονίκη 1969, 505515
- Βασιλειάδη Δ., «ΘΕΩΡΗΣΗ ΑΙΓΑΙΟΠΕΛΑΓΙΤΙΚΗΣ ΑΡΧΙΤΕΚΤΟΝΙΚΗΣ ΥΠΟ ΑΝΗΣΥΧΗ ΟΠΤΙΚΗ ΓΩΝΙΑ»
- «ΕΛΛΗΝΙΚΑ ΛΑΪΚΑ ΚΑΙ ΜΕΤΑΒΥΖΑΝΤΙΝΑ ΞΥΛΟΓΛΥΠΤΑ», Εθνικού Οργανισμού Χειροτεχνίας
- «ΕΛΛΗΝΙΚΗ ΠΑΡΑΔΟΣΙΑΚΗ ΑΡΧΙΤΕΚΤΟΝΙΚΗ», εκδ. Μέλισσα Gorlacher R. 2013. Intern. Council for Research and Innovation in Building and Construction. Proceedings of Meeting 46. Vancoyver, Canada 26-29 August 2013, p. 402.
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- Κακαράς Ι. 2009. Τεχνολογία Ξύλου: Πρίση – Ξήρανση – Εμποτισμός – Καμπύλωση – Καπλαμάς. Εκδ. ΙΩΝ, σελ. 248.
- Κακαράς Ι. 2012. Τεχνολογία Ξύλινων Δομικών Κατασκευών. Εκδόσεις ΙΩΝ, σελ. 734.
- Neufert E., Neufert P. 2009. Architect's Data. 3rd edition, Blackwell Science.
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- Piazza M. 2014. Tall buildings & Fire resistance, Regulations. Some remarks. In Proceedings of CLT Training course on "Structural Design of Cross Laminated Timber (CLT).
- Σιμωνέτης Γ. 2001. Λεξικό του γιαπιού και του πάγκου. Εκδ. «ΞΥΛΟ-ΕΠΙΠΛΟ», Αθήνα, 2001.
- Τσουμής Γ. 1983. Δομή, Ιδιότητες και Αξιοποίηση του Ξύλου. Α.Π.Θ., 1983, σελ. 655.

-Scientifiv Journals and professional brochures (APA, TRADA etc):

- Holz als Roh- und Werkstoff
- Journal of Wood Science
- Drvna Industrija [Wood Industry]
- Wood Research