LESSON DESCRIPTION

1. ΓΕΝΙΚΑ

Found.	Univ. of Thessaly		
FACULTY	TECHNOLOGY		
DEPT.	FORESTRY, WOOD SCIENCE AND DESIGN		
STUDY LEVEL	*Undergraduate*		
Lesson Code	ΞΣΥ 711	**Semester**	7th
LESSON TITLE	Furniture Manufacturing Technology		

ACTIVITIES	**WEEKLY HRS**	**ECTS**
Theoretical	2	4
Laboratory	1	2
Total	**3**	**6**

TYPE OF COURSE	Scientific area
PREREQUISITES:	None
LANGUAGE TEACHING AND EXAMINATION:	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes
WEBPAGES COURSE (URL)	https://eclass.uth.gr/courses

2. LEARNING OUTCOMES

Learning Outcomes

Purpose of the course is for the students to get to know the types of furniture, their historical evolution from a technological point of view and the current technological production processes. To combine properly design of the furniture to human body data and to be able to distinguish the furniture according to the production method, to materials used or using any other criterion. To know furniture making hand tools which – in combination to machines – are used to produce each type of furniture. To know all the accessories and complementary materials of modern furniture and their potential applications. To examine the stresses of the furniture and to propose the appropriate joints. To specify the correct order of implementation of tasks, to store and pack the furniture correctly.

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

• To know and distinguish the evolution over time of the way of construction and the form of furniture, by means of used technology.

• To set the furniture design criteria and their effect on the technological - production processes.

• To recognize - and avoid - mistakes in the design and construction of the furniture.

• To correctly assess the reasons for the supply of furniture.

• To propose and implement modern ecological concepts in the construction - supply - use - retirement of the furniture.

• To distinguish between types of furniture based on space, functionality and method (materials) of construction, construction technology or any other criteria.

• To know and apply ergonomic features in the design for each type of furniture, based on anthropometric data and modern understandings of the science of ergonomics.

• To know the basic stresses of furniture and to propose/implement the correct connections, depending on the traditional and modern materials used.

• To know the basic hand tools of furniture making, their use and maintenance.

• To know the connecting materials (screws, nails, etc.), furniture hinges, furniture fittings and mechanisms, types, variations, installation methods, indicated applications.

• To recognize and accordingly design/build the types of doors in the furniture, with variations, indicated uses and ways of placement.

• Be familiar with modern production systems in the furniture industry (eg 32 mm System).

• To draw up Material Tables and correctly transfer construction plans to forms.

• To clearly specify the Production Stages. To separate the cases of manufacturing furniture with a solid wooden frame, furniture made of wooden boards, upholstered furniture, furniture made of wicker, glass, metal or other materials, so to use the proper mechanical equipment and/or choose proper accessory materials.

• To ensure the correct intermediate and final storage of the products.

• Know and select/recommend the correct mattress and foam furniture materials.

• Know and choose/recommend the right furniture accessories (mechanisms, knobs, modern trends, automations, etc.), both for indoor and outdoor furniture

• To possess in a large extent the specialized terminology of the furniture industry..

General Skills

- Search, analysis and synthesis of data and information, also using appropriate technologies
- Respect for the natural environment
- Project design and organize production
- Decision making
- Autonomous work
- Teamwork, coordination of actions
- Critical perception, flexibility of actions
- Promotion of free, creative and inductive thinking.

3. COURSE CONTENT

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

• The evolution of the construction method through ages and the characterization of furniture by means of used technology.
• The application of furniture design basics in the technological-production processes.
• Possible errors in design and construction of furniture
• Recognizing reasons for sourcing furniture, in order to adjust his plans/projects accordingly
• Modern ecological concepts and their adaptation to the manufacture - supply - use of the furniture.
• Types of furniture and their distinction based on space - functionality - type and method (materials) of construction - construction technology - quality - with other criteria.
• The ergonomic features in the furniture, combined with the anthropometric elements. Indicated dimensions of furniture, specialization in: Kitchen cabinets - Wardrobes - Beds - Tables - Chair (seat) - Desk.
• The mattress in a piece of furniture and its importance in the physiology of the human body. The types of layers.
• The ways of loading (mechanical stresses) and how they affect the performance of the furniture.
• The types of joints in the furniture. Wood joints distinctions.
• Furniture hand tools, types of hand tools, maintenance.
• Fasteners, furniture swivels, brackets, furniture mechanisms. Types, variations, placement methods, indicated uses.
• The doors on the furniture, types of doors – variations, methods of placement.
• The modern production systems in the furniture industry (32 mm System).
• The compilation of Material Tables, transfer of the construction plan to forms.
• Production steps - Intermediate and final storage - Duration of storage – Storage conditions.
• The manufacture of furniture with wood panels, machines used - series of tasks.
• The manufacture of furniture from solid wood, machines used - series of operations.

• The manufacture of upholstered furniture (upholstery), machines used - sequence of work, additional materials used..
• The furniture attachments (knobs, modern trends, automations, etc.).
• Rattan & bamboo furniture, Materials - Tools - Machinery - Techniques.
• The particularities of outdoor furniture. Threats - protection - recommended wiring and materials.
• The basic terminology of cabinet making.

The course includes a **Laboratory** part.
In laboratory part of the course the students are taught and learn about:
• The basic types of joints, their indicated applications, while at the same time they become familiar with most hand tools.
• The distinction in practice between furniture with a frame, furniture made of wood panels and upholstered furniture.
• The correct order of planning and carrying out furniture manufacturing operations.
• The application of additional equipment (hinges, mechanisms, hinges, automations, etc.)
• The properties and application of specialized techniques and materials in the furniture, e.g. veneers – marquetry, springs - foam materials – leather/fabric – upholstery.

Attending the laboratory part is mandatory for **80%** of the hours. Students per group make 1-2 simple constructions. At the end of the semester there is a written exam, with exercises based on practical examples.

Practical exercise of the course is not provided during the semester. However, from the 1st week, the teacher can suggest assignment topics with key words and urges the students to work (optionally) on their preparation. The assignments are presented during the 10th - 13th week in the classroom, with a duration of 10-12 min. They are graded up to 30% of the final grade, as an incentive for their preparation.

4. TEACHING AND LEARNING METHODS-EVALUATION

<table>
<tr><td>DELIVERY METHOD</td><td>Combined application of educational methods and techniques in order to enhance the active participation of students in the course and attain the greatest possible effectiveness in "face to face" teaching:</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>• 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.</td></tr>
<tr><td>MANAGEMENT OF TEACHING</td><td>
<table>
<tr><th>Δραστηριότητα</th><th>Φόρτος Εργασίας Εξαμήνου</th></tr>
<tr><td>Lectures</td><td>22</td></tr>
<tr><td>Assignment presentation, answering questions</td><td>4</td></tr>
<tr><td>Laboratory exercises</td><td>13</td></tr>
<tr><td>Educational visit in factories</td><td>41</td></tr>
<tr><td>Individual and work study</td><td>70</td></tr>
<tr><td>Course Total</td><td>150</td></tr>
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<tr><td>STUDENT EVALUATION</td><td></td></tr>
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	I. Student assessment takes place at the end of the semester by means of written examination which include questions requiring: - Short answers that affair all topics of the class, multiple choice anwers. • Any completed assignment is taken into account (up to 30%). II. Written or oral exam (100%) in laboratory, which includes: - Solving problems or suggestions related to the subject of the course (e.g. suggestions for the correct implementation of a plan, selection of materials, maintenance of tools, distinction between tools, materials, etc.)

5. RECOMMENDED BIBLIOGRAPHY

Books offered to students through the *Eudoxus* platform:

- Αλεξανδρίδης Π. 1983. Ρυθμολογία και Αρχιτεκτονική του Επίπλου. Εκδ. Γαλάζιο Αιγαίο.
- Dreyfuss H. Associates and Tilley, Alvin R. 2002. The Measure of Man and Woman. Revised Edition. New York: John Wiley & Sons, Inc., 2002.
- Eckelman, C.A. 2003. Textbook of Product Engineering and Strength. Design of Furniture. Purdue University Press. West Lafayette, IN., USA.
- Gheen W. L. 1994. Upholstery techniques. TAB Books, USA 1994.
- Jűrgens H.W., Aune I.A., Pieper U. 1990. International Data on Anthropometry. Occupational Safety and Health Series No 65, ILO, Geneva 1990.
- Neufert E., Neufert P. 2009. Architect's Data. 3rd edition, Blackwell Science.
- Noll, T. 1998. Techniques des Assemblages en Bois. Eyrolles, Paris, 1998.
- Noll, T. 2006. The Joint Book. The complete guide to wood joinery. Chartwell Books Inc., New York, USA.
- Σιμωνέτης Γ. 2001. Λεξικό του γιαπιού και του πάγκου (Γλωσσάρι της μαστοράντζας). Εκδ. «ΞΥΛΟ-ΕΠΙΠΛΟ», Αθήνα, 2001, σελ. 478.
- Σκαρβέλης Μ. 2019. Τεχνολογία Παραγωγής Επίπλου. Εκδ. ΤΖΙΟΛΑ, ISBN: 978-960-418-506-1
- Smardzewski, J. 2015. Furniture Design. Ed. Springer, p. 652.
- Zwerger, K. 2000. Wood and Wood Joints: Building Traditions in Europe and Japan. Birkäuser ed., Berlin, 2000, p. 278.

-Papers from scientific journals, as:

- Holz als Roh- und Werkstoff
- Journal of Wood Science