

COURSE OUTLINE

ENVIRONMENTALLY FRIENDLY TECHNOLOGIES IN WOOD PRODUCTS SCIENCE

(1) GENERAL

SCHOOL	TECHNOLOGY		
DEPARTMENT	FORESTRY, WOOD SCIENCES & DESIGN		
LEVEL	POSTGRADUATE		
COURSE CODE	M127	SEMESTER	2 nd
COURSE TITLE	ENVIRONMENTALLY FRIENDLY TECHNOLOGIES IN WOOD PRODUCTS SCIENCE		
ACTIVITIES		WEEKLY HOURS	ECTS
Lectures		2	6
TOTAL		2	6
TYPE OF COURSE	ELECTIVE COURSE IN ALL SPECIALIZATIONS		
PREREQUISITES	NO		
LANGUAGE OF TEACHING AND EXAMINATION	GREEK		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO		
WEBPAGES COURSE (URL)	https://eclass.uth.gr/courses/FWSD_P_125/		

(2) LEARNING OUTCOMES

Learning Outcomes
<p>The main purpose of the course is to deepen the student's knowledge of environmentally friendly wood product production technologies. Through the teaching of the course, stimuli will be given to introduce new or modify existing processes for the production of wood products based on respect for the environment. In this way, the institutions in which the students are active will be able, on the one hand, to harmonize with the modern requirements for increased environmental sensitivity and become more attractive and competitive both nationally and internationally.</p> <p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> • To know quantitative and qualitative characteristics of wood waste both for the Greek and for the European area • To know wood recycling technologies • To know recycling technologies of welded wood products and properties of the resulting products • To know the possibilities of using alternative raw materials to replace wood for the production of composite products and properties of the resulting products • To know wood thermal modification technologies and properties of the resulting products • To know chemical wood modification technologies and properties of the resulting products • To know wood densification technologies and properties of the resulting products • To choose the appropriate wood modification technology according to the needs of the use • To compare wood modification technologies • To know the possibilities of wood cultivation (eg poplar) and its utilization
General Skills

(3) COURSE CONTENT

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

- General – assignment of tasks
- Wood waste and recycling
- Recycling of composite wood products
- Soaked wood reuse technologies
- Alternative raw materials for the production of composite wood products
- thermal modification of wood
- chemical modification of wood
- hydrothermal densification of wood
- hydro-thermo-chemical densification of wood
- Possibilities of growing wood and using plantation wood

From the 1st course, a suggested list of assignments is provided, from which the student will individually choose and undertake to prepare until the end of the semester of the MSc. The relevant directions are given, while relevant material and instructions are posted on the e-class.

The final assignment includes, in addition to paper and electronic submission, a public oral presentation on the chosen topic, on a set date (usually the 12th or 13th week of classes). The presentation lasts 15 minutes and is followed by 5 minutes of questions from the students present. The teacher intervenes - if necessary - for comments, observations, corrections.

Students are graded on the overall performance of their final paper: 70% on the content and editorial specifications and 30% on the preparation of the online presentation and its oral support.

These grades count for 40% of the overall grade that students will receive after the final written theory exam.

(4) TEACHING AND LEARNING METHODS - EVALUATION

COURSE DELIVERY METHOD	In class and remotely	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	<ul style="list-style-type: none"> • Use of PC, ppt slides, projector • Learning process support through the e-class electronic platform • Interactive Whiteboard 	
MANAGEMENT OF TEACHING	Activity	Semester Workload
	Lectures	26
	Small individual practice tasks	20
	Final Assignment	60
	Independent Study	44
	Course Total (25 workload hours per credit unit)	150
STUDENT EVALUATION	I. Written final exam (60%) II. Presentation of Individual Work (40%).	

(5) RECOMMENDED-BIBLIOGRAPHY

- Suggested Bibliography:

- Lykidis, C., Grigoriou, A., 2004. The influence of steam-recovering conditions on the quality of recycled particle boards. In Proceedings of "Management of Recovered Wood Recycling, Bio Energy and other Options". Thessaloniki, 22-24 April 2004, pp. 317-326
- Λυκίδης, Χ. Θ. και Α. Θ. Γρηγορίου, 2005. Η ανακύκλωση των ξύλινων κατασκευών και η σημασία της στην προστασία του φυσικού περιβάλλοντος. Πρακτικά διημερίδας της Ένωσης Νέων Θεσσαλονίκης και του Α' Δημοτικού Διαμερίσματος Θεσσαλονίκης με τίτλο: «Περιβάλλον και σύγχρονος τρόπος ζωής», Κέντρο Ιστορίας Θεσσαλονίκης, 15-16 Απριλίου 2005. Σελ. 68-76
- Lykidis C., Konstantakos P. and S. Tsalikis, 2013. Effects of closed system hydrothermal treatment conditions on colour and hardness of European beech wood. In Proc. of: 3rd COST FP0904 Conference: "Evaluation, processing and prediction of THM treated wood behavior by experimental and numerical methods", 9-11 April 2013, Iasi, Romania, pp. 41-42.
- Willems W., Lykidis C., Altgen M. and L. Clauder, 2015. Quality control methods for thermally modified wood. A Review. COST Action FP0904 2010-2014: Thermo-Hydro-Mechanical wood behaviour and processing. *Holzforschung*, Volume 69, Issue 7, Pages 875–884.
- Hill, C. A. S. (2006) *Wood Modification: Chemical, Thermal and Other Processes*, John Wiley and Sons, Chichester
- Kollman, F.P., Kuenzi, E.W., Stamm, A.J., 1975. *Principle of Wood Science and Technology*. In: *Wood Based Materials*, first ed., Vol. II. Springer-Verlag, New York, Heidelberg, Berlin
- Navi P, Sandberg D (2012) *Thermo-hydro-mechanical processing of wood*. Engineering sciences. EPFL Press, Lausanne

- Related scientific journals:

- Waste Management
- *Holzforschung*
- Resources, Conservation and Recycling
- BioResources
- Wood Science and Technology
- Journal of Wood Science
- European Journal of Wood and Wood Products/*Holz als Roh - und Werkstoff*
- Wood and Fiber Science
- Journal of Wood Chemistry and Technology
- Wood Material Science and Engineering
- International Wood Products Journal
- Wood Research