COURSE OUTLINE

1. GENERAL

INSTITUTION	University of Thessaly		
SCHOOL	School of Technology		
DEPARTMENT	Dept. of Forestry, Wood Sciences and Design		
LEVEL	*Undergraduate*		
CODE	ΞΣΥ841	**STUDENT SEMESTER**	8th
COURSE TITLE	**Chemical Technology of Wood**		

ACTIVITIES	**WEEKLY HRS**	**ECTS**
Lectures	3	5

TYPE OF COURSE	Obligatory course (direction: *Wood sciences & design*)
PREREQUISITES:	None
LANGUAGE TEACHING AND EXAMINATION:	Greek
THE COURSE OFFERED TO STUDENTS ERASMUS	Not offered
WEBPAGES COURSE (URL)	http://mantanis.users.uth.gr/Chemical-technology-of-wood.pdf

2. LEARNING OUTCOMES

Learning Outcomes

The aim of the course is the students, who are in the direction of *Wood sciences & design*, to emphasize more and learn topics related to the wood chemical technology, that is, to get educated respecting the chemical composition and structure of wood and its chemical properties.

Additional scope is to get acquainted with some important chemical technologies such as modification, densification, pulping, adhesion, pelletisation, etc., which are applied in processes to yield valuable end products from wood via chemical, or thermochemical or mechanochemical means.

General Skills

Upon successful completion of this course, the students will be able to develop and cultivate basic professional and social skills:

- Search, analysis and synthesis of data and information
- Autonomous work
- Respect for the natural environment
- Exercise criticism and self-criticism
- Promoting free, creative and inductive thinking
- Understanding highly technological developments and their implications

3. COURSE CONTENT

The course focuses on issues related to:

- Chemical composition and structure of wood as a lignocellulosic material
- Isolation of wood polymeric components
- Extraction of wood – laboratory processes
- Importance of chemical characteristics of wood to end uses & material properties
- Acidity of wood and its consequences to specific processes

- Modification of wood (chemical, thermal, impregnation) and products thereof
- Hydrothermal modification of wood
- Densification of wood and products thereof
- Wood adhesion and adhesives
- Pelletisation – Production of wood pellets and qualities / end-product properties
- Pulping of wood & several wood-derived products (pulp, paper, cardboards)

During the course, in addition to lectures:

- Case studies are used which are the subject of discussion during the lectures
- Search in the internet: Students are assigned to look up for specific modern technologies

Course lectures are supported by **videos** shown to the students regarding several industrial chemical processes. Demonstration of wood samples of end (chemical) products in the classroom.

4. TEACHING AND LEARNING METHODS - EVALUATION

DELIVERY METHOD	Face to face The course is organized in one main stream: -- Lectures, which analyze the concepts and methodologies that form the core of the course materials.
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	
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 • participation in course activities (lectures etc.)

Activity	***Semester Workload***
Lectures	40
Individual homework	30
Laboratory workshops	--
Individual and work study for term assignment	55
Term assignment presentation	--
Course Total	***125***

5. RECOMMENDED BIBLIOGRAPHY

- Gould, R. F. (Ed.). (1977). Wood Technology: Chemical Aspects, Copyright, ACS Symposium Series, FOREWORD. ACS Symposium Series. AMERICAN CHEMICAL SOCIETY. https://doi.org/10.1021/bk-1977-0043.fw001
- Navi, P., & Sandberg, D. (2012). Thermo-hydro-mechanical processing of wood. Lausanne: EPFL Press. Link- https://www.diva-portal.org/smash/get/diva2:997954/FULLTEXT01.pdf
- Pizzi A, Mittal K.L.., 2010. Wood Adhesives, Koninklijke Brill NV, Leiden.

- SJÖSTRÖM E., 1993. Wood Chemistry, Fundamentals and Applications.
- Forest Products Laboratory. 2010. Wood handbook—Wood as an engineering material. General Technical Report FPL-GTR-190. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. Link- https://www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr190.pdf
- Fengel, D., Wegener, G. 1984. Wood. Chemistry, Ultrastructure, Reactions. Walter de Gruyter, Berlin, New York.
- Γρηγορίου Α., 2008. Χημεία Και Χημικά Προϊόντα του Ξύλου, Εργαστηριακές Σημειώσεις. ΑΠΘ, https://users.auth.gr/agrigori/Chemistry%20and%20Chemical%20Technology%20of%20Wood.pdf
- Φιλίππου Ι., 2014. Χημεία Και Χημική Τεχνολογία Ξύλου. Εκδόσεις Γιαχούδη. Θεσσαλονίκη.
- Hill, C. (2006). Wood modification. Wiley.
- Sandberg, D. et al. (2017) Review: http://mantanis.users.uth.gr/R2017-01.pdf