

SYLLABUS

Name of the course (as specified in the approved curriculum) Wood biodeterioration and its preservation		Number of ECTS Credits 5
Name of the course in Polish Biodegradacja drewna i jego ochrona		
Unit providing the course (Department/Institute) Department of Wood Chemical Technology		
Course leader Prof. Dr. hab. Bartłomiej Mazela, Dr. Waldemar Perdoch		
Field of study Erasmus	Level	Semester
TYPE OF CLASSES (course load)		
- Lectures		30
- Practical classes		40
- Contact hours		8
- Self-study		75
Total number of hours		153
OBJECTIVE OF THE COURSE		
The aim of the course is to familiarize students with the theory and practice related to two aspects: wood biodeterioration and wood protection and preservation. Scope of course topic will be covered following areas:		
<ol style="list-style-type: none"> 1. Introduction to wood biodeterioration and wood preservation (Moisture, Wood Degradation, Naturally Decay-resistant Species, Protection by design). 2. Destruction of wood by abiotic factors. 3. Destruction of wood by biotic factors (Bacteria, Insects, Fungi). 4. Preservation technology (Preservation principles, Wood structure, Moisture content fluctuations). 5. Preservation systems (Preservation mechanisms, Application techniques, Evaluating preservative systems). 6. Preservation chemicals. 7. Environmental considerations for wood preservatives. 		
TEACHING METHODS		
Lectures based on multimedia presentation with elements of discussion. Laboratory testing		
Course learning outcomes		The reference to field of study outcomes
Knowledge	O1 has advanced knowledge of mathematics, physic and related sciences adjusted to wood science	WS2A_K01
	O2 has advanced knowledge of chemistry and related sciences adjusted to wood technology	WS2A_K03
	O3 reveals expertise of advanced methods and tools used for solving problems in area of wood technology	WS2A_K07
	O4 reveals expertise of advanced method, techniques, technologies, tools and materials in the scope of wood technology as it enables to utilize and develop potential of nature in order to improve human living quality	WS2A_K10
Skills	O5. has skills to seek out, understand and analyze information in a range of wood technology as coming from different sources and given in different form, as well creative interpretation of information, derive conclusions, express and justify opinion	WS2A_S01
	O6 is able to plan independently and carry out research or design tasks in the area of wood technology, as well as analyze and assess correctness of carried out tasks	WS2A_S04
	O7 is able to analyze independently and comprehensively problems influencing production in wood processing industry, health of people, conditions of natural environment and natural resources. reveals expertise of applying and optimizing special techniques as adapted for wood science;	WS2A_S05
	O8 has skills for selecting and modifying typical actions in wood technology with a use of right techniques in order to enable improving quality of life of people together with rational utilization of natural resources	WS2A_S06
	O9 is able to use analytical methods, simulations and experiments for defining and solving engineering tasks	WS2A_S12
Social skills	O10 understands the need for continuous learning, is able to inspire and organize learning processes of other persons	WS2A_C01
	O11 is able to cooperate and work in a team, both as a leader and a member of a team	WS2A_C02
	O12 is able to establish proper priorities connected with solving tasks being defined by a student or others	WS2A_C03
Methods of evaluation of outcomes achievement Exam, partial exam, training protocols Project and discussions		Symbols of course learning outcomes O1, O2, O3, O4, O5, O6, O7, O8, O9 O10, O11, O12

TEACHING CONTENT

This course is intended to increase your knowledge of the causes and control of wood decay, degradation and stain. A common cause for replacing wood structures is decay or degradation. Wood decay and most insect problems can be prevented for years by properly using and protecting wood. When left untreated in many outdoor applications, wood becomes subject to degradation by a variety of natural causes. Because most commonly used wood species, possess little decay resistance, extra protection is needed when they are exposed to adverse environments. Wood can be protected from the attack of decay fungi, harmful insects, or marine borers by applying chemical preservatives. The degree of protection achieved depends on the preservative used and the proper penetration and retention of the chemicals. Some preservatives are more effective than others, and some are more adaptable to certain use requirements. Not only are different methods of treating wood available, but treatability varies among wood species—particularly their heartwood, which generally resists preservative treatment more than does sapwood. To obtain long-term effectiveness, adequate penetration and retention are needed for each wood species, chemical preservative, and treatment method.

The course completion criteria and methods

Final test

Laboratory work

Percent of a final
grade

80%

20%

RECOMMENDED LITERATURE

1. Baust J.G., Baust J.M. (2007): Advances in Biopreservation. CRC Press, Taylor & Francis Group.
2. Bulian F., Graystone J.A. (2009): Industrial Wood Coatings. Theory and Practice. Elsevier.
3. Cassens D.L., Feist, W.C., Johnson B.R., De Groot R.D. (1995): Selection and use of preservative-treated wood. Forest Products Society. Madison, Wisc. 104 p.
4. Forest Products Laboratory (1999) Wood handbook: Wood as an engineering material. U.S.Dept. of Agric. For. Serv. Agric. Handb. No. 72 Washington, D.C. 466 p.
5. Horrocks A.R., Price D. (2001): Fire retardant materials. CRC Press LLC.
6. Hull T.R. (2009): Fire Retardancy of Polymers. New Strategies and Mechanisms. RSC.
7. Karsa D.R., Ashworth D. (2002): Industrial Biocides. Selection and Application. RSC.
8. Kolb J. (2008): Systems in Timber Engineering. Birkhauser.
9. Richardson B.A. (2003): Wood Preservation. E & FN SPON.
10. Schmidt O. (2006): Wood and Tree Fungi. Biology, Damage, Protection, and Use. Springer-Verlag
11. Townsend T.G., Solo-Gabriele H. (2006): Environmental Impacts of Treated Wood. CRC Press, Taylor & Francis Group.
12. Unger A., Schniewind A.P., Unger W. (2001): Conservation of Wood Artifacts. Springer-Verlag.
13. Walker J.C.F. (2006): Primary Wood Processing. Principles and Practice. Springer.

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