VYTAUTAS MAGNUS UNIVERSITY
M C M X X I I

INSTITUTE OF FOREST MANAGEMENT AND WOOD SCIENCE

SUBJECT DESCRIPTION

Subject code: MEMMB043

Subject title: Forest products science

Credit value 3 ECTS, 80 hours: 48 contact hours, ***32*** student independent work hours.

Types of student learning activities

Classwork and tutorials	*Hours*	*Student independent work/self-study*	*Hours*
Lectures	23	Preparation for practicums	16
Distance learning	6		
Practicums	16	Preparation for exam	16
Distance learning	2		
Training practice	6		
Seminars			
Tutorials/consultations	1		
Examination	2		
Total	**48**		**32**

Subject purpose

Study cycle	*Study programme*	*Type of the subject*
First cycle	Forestry	Compulsory

Subject objectives: The main goal of the subject of Forest products science is to impart knowledge to students about sortments of forest products, their main features, defects, used standards and specificities of storing, to develop students analytical thinking which enables to make a differential assessment of round wood quality, and optimization of sorting, explain and interpret causalities of round wood market formation in Lithuania and Europe.

Prerequisites: Knowledge of chemistry, higher mathematics and theory of probability research methodology, physics, computer science, plant anatomy, morphology and physiology, entomology, plant diseases, dendrology, dendrometry sciences.

Learning outcomes:

Knowledge and their application

1. Knows the basic terminology of wood products in Lithuanian and one of foreign (English) languages;
2. Understands wood macro and micro structure;
3. Knows the wood structure specific of different tree species;
4. Knows the physical, chemical technological and ecological properties of wood;

5. Knows features and defects influencing wood quality;
6. Knows roundwood quality standards of the main tree species;
7. Understands the peculiarities of the of round wood market formation;
8. Knows nonwooden forest product resources in Lithuania, features of their collection storage and marketing;
9. Knows historical heritage of wooden buildings in Lithuania;
10. Knows historical heritage of home keeping wooden tools and use of wood as an inside and outside decoration material of houses.

Special abilities

1. Able to recognize the wood by different tree species;
2. Able to detect and evaluate the visible and the hidden defects of the round wood;
3. Able to perform differential analysis and assessment of the quality of target destination wood products, wood harvesting and processing residuals;
4. Able to optimize round wood sorting in respect of the tree stem and all cutting area;

Personal and social abilities

Able to discuss and argue on the wood quality and standards issues.

Values and attitudes

1. Respect to nature, its sustainable use and national and historic heritage of the tradition to use forest products;
2. Determination for whole life learning, professional and spiritual self-improvement;
3. Determination for healthy and sustained home and home environment;
4. Determination to synchronise ecological, social and economical benefits, respect the forester's profession, which sis based on family tradition and rural landscape.

Assessment criteria of learning outcomes:

1. Understanding and use of round wood terms and definitions;
2. Adoption and use of the knowledge and skills listed in the list of learning outcomes in the simple situations.
3. Grading optimization quality for separate stem and stems of all cutting area. Summarizing the results.
4. Evaluation and use of analytical optimization methods.
5. Identification of issues on wood quality assessment, reasoned interpretation and adoption statements on wood quality standards;
6. Understanding of round wood market formation principles in Lithuania;
7. Self-independent study of literature;
8. Preparing for master level studies.

Subject content:

Lectures: (23hours, 15 – contact learning / 6 – distance learning):

1. Wood main terms and definitions (1);
2. Tree components. Wood macrostructure (0/2);
3. Wood microstructure (2);
4. Physical properties of wood (2);
5. Chemical properties of wood (1);
6. Features and defects of roundwood (2/2);
7. Wood products: technical requirements, standards (2);
8. Optimization of stem cross cutting (2);
9. Differential analysis of chipped wood gotten from logging and processing residuals. (1);
10. Nonwood forest products (2);
11. Wood resources in Lithuania (0/2);
12. Forest goods flows (1);
13. Applications of wood use (1).

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Practicums *(16 hours, contact learning 14 hours / distance learning 2 hours):*

1. Differential assessment of wood and recognition of tree whom wood might belong to (4);
2. Measurement and assessment of wood features and defects. (4);
3. Differential assessment of quality of the roundwood products. (4);
4. Optimization of croscutting for separate stem. (1/1);
5. Optimization of croscuttings for stems on all cutting area. (1/1).

Training practice *(6 hours.):*

1. Grading of a logs at a cutting area (3);
2. Grading of a logs at a buyers yard (3).

Methods of teaching:

Multimedia projector and desk used for visualisation materials of lectures. During the lecturers students are involved in to the polemic discussions. Case analysis, problem extraction and solving problems, insights, mathematic programing (linear programing) methods are used during the practicums. Practical assignment students are doing independently using descriptions of practicums and asking questions to lecturer. Optimisation of stem crosscuting are performed in a computer classroom using unique crosscuting visualisation programme and standard statistical packages with linear programming functions. 6 hours of lectures and 2 hour of practicums will be prepared for the distance learning in the Moodle virtual learning system.

Assessment methods of student learning outcomes:

Grades for the practicums are assessed according to quality of oral answers to the questions of individualized tasks and ability to discuss on the thematic issues.

Exam has a test of 30 questions with 4 close type answers for each question.

Structure and terms of cumulative assessment

Types of students' independent work	*Weight score*	*Deadlines of assessment*
Practicums	40	After each practicum
Exam	60	At the end of semester

Interaction between study programme learning outcomes and learning methods and methods of student learning outcomes assessment

Study programme learning outcomes	*Subject learning outcomes*	*Teaching methods*	*Assessment methods of student learning outcomes*
To know and apply the methods of mathematics, physics and chemistry when solving the technological problems of silviculture and wood industry	Understands wood macro and micro structure	Lectures, discussion	Exam in test form
	Knows the wood structure specific of different tree species		
	Knows the physical, chemical and technological properties of wood		
Knowledge on inventory of forest resources, suitable use of forests and forests products, the main forestry activities, management and marketing in forestry and their application towards sustainable forestry	Knows the basic terminology of wood products in Lithuanian and one of foreign (English) languages	Lectures	Exam in test form
	Knows features and defects influencing wood quality		
	Knows roundwood quality standards of the main tree species	Lectures, discussion	Exam in test form
	Understands the peculiarities of the of round wood market formation	Special stem crosscuting - imitation modeling and visualization program Standard packages of statistical analysis with linear programming function	Defending practicum in test form, and oral defending results of individual tasks
	Able to discuss and argue on the wood quality and standards issues	Oral discussion on a presented results of stem crosscutting optimization.	Exam in test form
Identify grass and	Able to recognize the wood by different tree	Real wood samples are used at practicum	Defending practicum by identification real

woody plants, forest mushrooms, insects, common, protected and game bird and animal species, soil types, forest types, forest products, ecological problems	species		samples
	Able to detect and evaluate the visible and the hidden defects of the round wood	Real wood samples are used at practicum	Defending practicum by identification real samples,
Apply GIS and other information technologies, dendrometry methods in inventory, planning and administration of forest resources	Able to perform differential analysis and assessment of the quality of target destination wood products, wood harvesting and processing residuals	Natural massive and chipped wood samples are used at practicum. Real standards are analyzed. Photogrammetric methods used for assessing storages of round and chipped wood (Photos from unmanned octocopter).	Defending practicum by identification real samples
Respect to nature, its sustainable use and national and historic heritage of the tradition to use forest products Determination for whole life learning, professional and spiritual self-improvement Determination for healthy and sustained home and home environment Determination to synchronise ecological, social and economical benefits, respect the forester's profession, which	Knows the physical, chemical technological and ecological properties of wood	Emphasis to historical wood use values during the lectures, presenting successful examples of wood use by photo and video	Exam in test form
	Knows historical heritage of wooden buildings in Lithuania		
	Knows historical heritage of home keeping wooden tools and use of wood as an inside and outside decoration material of houses		

sis based on family tradition and rural landscape			

Required literature references for subject study:

1. Brown, H. P., Panshin, A.J., 1940. Commercial Timbers of the United States. McGraw-Hill company. 554p.
2. Flynn, J. H., Holder, Ch. D. 2001. A guide of useful woods of the world. Forest Products Society. Madison WI, 640p.
3. Hartmann ,G., Nienhaus ,F., Butin,. H. Medžių ligų ir kenkėjų atlasas. Vilnius, UAB "Petro Ofsetas". 2005. 286p.
4. Jakimavičius, Č. Medienotyra. 2004. Kaunas, Kauno technologijos universitetas. 272p.
5. Papreckis, B. Aiškinamasis medienos terminų žodynas. Kaunas, „Technologija“, 1998. 211p.
6. Petrauskas, E., Kuliešis, A., Tebėra, A. 2010. Medienos tūrio lentelės 4 laida. Kaunas,"Naujasis lankas”,. 190p.
7. Repšys,J. Miško taksacija. 1994, Vilnius, “Mokslo ir enciklopedijų leidykla”, 352p.
8. Вакин, А.Т., Полубояринов, О.И. Соловев, В.А. 1980. Пороки древесины. – Москва, Лесная пром-сть,.
9. Уголев, Б.Н. 2004. Древесиноведение и лесное товароведение. М, Академия,. 266p.

Recommended literature references for subject study:

1. Bucur, V. 2016. Handbook of Materials for String Musical Instruments. Springer. 975 p.
2. Demand and supply analyses of roundwood and forest products markets in Europe. EFI proceedings No. 17, 1997. 422p.
3. Lipinš L. Stumbru racionâla sagarumošana. LLU Meža izmantošanas katedra. APGÂDS, Liesma. 1999, 76 p.
4. Price C. The theory and application of forest economics. Oxford: Basil Blackwell. 1989. 402 p.
5. Nordic Timber. Grading rules for pine and spruce sawn timber. Stockholm, Arbor publishing AB.1995. 80p
6. Standartai: LST EN 1927-1, LST EN 1927-2, LST EN 1316-1, LST EN 1316-3, LST 1609, LST 1778.
7. Перелыгин Л.М., Уголев Б Н Древесиноведение. М. Лесная промышленность, 1971. 286.
8. Семейкин А. Справочник снабженца. М. Торговы дом металлов. 21v. , 2001. 306p.
9. http://tropical.theferns.info/
10. http://www.wood-database.com/
11. https://link.springer.com/journal/10086

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