

MINISTRY OF HIGHER AND SECONDARY SPECIALIZED EDUCATION
OF THE REPUBLIC OF UZBEKISTAN

TASHKENT CHEMICAL-TECHNOLOGICAL INSTITUTE



"APPROVED"
Vice Rector of TCTI

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01 2020 y.

SYLLABUS
on discipline

WOOD CHEMISTRY

Area of knowledge: 300000 – Production and technical area
Area of education: 320000 – Production technologies
The direction of education: 5320300 – Technological machines and equipment
(technology of woodworking)

Types of lessons	Hours
- lecture	36
- practical lessons	54
- laboratory lessons	18
- self-education	92
Total	200

Tashkent – 2020 y.

The syllabus of the discipline was prepared on the basis of "Wood Chemistry" syllabus, approved by the order of the Ministry of Higher and Secondary Specialized Education of the Republic of Uzbekistan No. 394 of May 02, 2019 (Appendix 3).

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The syllabus was discussed at the meeting of the Department "Technology of cellulose and woodworking" No. 1 of August 26, 2019 and recommended for the approval at the Scientific and Methodological Council of the Faculty.

Head of the department:



Docent Akmalova G.Y.

The syllabus was approved at the meeting of the Scientific and Methodological Council of the Faculty No. 1 of August 26, 2019 for the use in the educational process.

**Chairman of the Scientific
and Methodological Council
of the Faculty:**



Docent Boltaboyev U.N.

1. Methodical instructions for discipline teaching

This syllabus provides the teacher and students with a common direction that sets the stage for learning throughout the course. Students have access to the this syllabus, because will handed out digital copies on the first day of class.

Purpose of teaching this course is:

- create an English learning environment for students;
- use the CLIL methodology (content-language integrated learning);
- develop the skills of ESP (English for special purposes), etc.

The English environment is used as experience only in lectures. Practical classes can be conducted in Uzbek or Russian based on the language skills of practical teachers.

In the discipline "Wood Chemistry" are provided the information about the chemical composition of wood and its changes, chemical processing of wood and its modification, wood bonding processes, chemicals and adhesives, used in woodworking and glued wood composites.

As a result of studying the discipline, the student must obtain:

- *know* the chemical composition of wood, the effects of chemicals on wood, safety regulations for the chemical processing of wood, methods of gluing and modifying wood;
- *have the skills* of extracting wood, determining the ash content in it, etching, preparing for gluing and gluing, testing adhesives and wood composites;
- *have the qualification* of analysis of the chemical composition of wood, its chemical processing and modification.

2. Lectures

№	Name of topic	Volume, hours
	1-module. Chemical composition of wood	
1.	Wood cells	2
2.	The structure of the walls of wood cells	2
3.	Cellulose, hemicelluloses and lignin in the composition of wood and bark	2
4.	Extractive substances of wood	2
5.	Wood extraction	2
6.	Chemical analysis of wood	2
7.	Physical and Chemical methods of wood analysis	
	2 module. Chemical wood processing	2
8.	Laminated Wood Composites	2
9.	Wood chip and fiber composites	2
10.	Wood-glue mixture and wood pressing masses	2
11.	Thermal wood processing	2
12.	Wood pyrolysis	2

13.	Burning of wood	2
14.	Wood gasification	2
15.	Wood fire protection	2
16.	Protection of wood from biodegradation	2
17.	Chemical modification of wood	2
18.	Wood hydrolysis	-
	Final control (presentation, conducts in the examination week)	36

3. Practice

№	Name of topic	Volume, hours
1.	Study of wood cells	2
2.	Study of the structure of the walls of wood cells	2
3.	Study of the chemical composition of wood	2
4.	Study of the cellulose of the wood	2
5.	Study of the hemicelluloses of the wood	2
6.	Study of lignin in wood	2
7.	Study of wood extractives	2
8.	Study of bark chemicals	2
9.	Study of methods of chemical analysis of wood	2
10.	Study of the extracting of the wood	2
11.	Study of the ash composition of wood	2
12.	Study of the obtaining of holocellulose from wood	2
	1-intermediate control	
13.	Study of the wood laminated composites	2
14.	Study of chipboard wood composites	2
15.	Study of fibrous wood composites	2
16.	Study wood-glue mix	2
17.	The study of adhesives used in woodworking	2
18.	The study of paint and varnish materials used in woodworking	2
19.	Study of methods for thermal processing of wood	2
20.	Study of wood pyrolysis	2
21.	Study of torrefaction of biomass	2
22.	Study of the mechanism of burning wood	2
23.	Study of wood fire protection	2
24.	Study of the wood gasification	2
25.	The study of physico-chemical modification of wood	2
26.	The study of chemical-mechanical modification of wood	2
27.	Study of the hydrolysis of wood	2
	2-intermediate control	
	Total	54

4. Laboratory exercises

№	Name of topic	Volume, hours
1.	Safety guidelines for chemical wood processing	2
2.	Wood extraction	4
3.	Determination of wood ash content	4
	1-intermediate control	
	Study of the wood pyrolysis	4
4.	Chemical modification of wood	4
5.	2-intermediate control	
	Total	18

5. Self-study and organization of independent works

The student's self-study can be organized in the following forms:

- thoroughly study of lecture materials;
- performance of practical tasks;
- preparation for laboratory studies and preparation of the report.
- preparation for rating control.

Self-acquired knowledge and skills are assessed in the frame of the intermediate and final controls.

6. Criteria for assessing and controlling knowledge

Criteria for evaluating the results of practical exercises

Points	Criteria of assessing
5	Has high theoretical knowledge and practical skills. Actively participated in the classes. Self study or Independent work was completed at the excellent level. The Notebook for practical classes was done on demand.
4	Has good theoretical knowledge and practical skills. Actively participated in the classes. Self study or Independent work was completed. The Notebook for practical classes was done on demand.
3	Has sufficient theoretical knowledge and practical skills. Passively participated in the classes. Independent work was carried out at the sufficient level. The Notebook for practical classes was made on demand.
0-2	Does not have sufficient theoretical knowledge and practical skills. Passively participated in the classes. Independent work was not completed. The Notebook for practical classes did not meet the requirements.

Criteria for evaluating the results of laboratory works

Points	Criteria of assessing
5	He knows the theoretical part of the laboratory work well. He did the lab work on his own. The design of the notebook for the laboratory work meets the requirements.
4	The theoretical part of laboratory work was known at the average level. He did the lab work on his own. The design of the notebook for the laboratory work meets the requirements.
3	He does not know the theoretical part of the laboratory work. Laboratory work was performed under the supervision of a laboratory assistant. The design of a notebook for the laboratory work meets the requirements.
0-2	Has no theoretical knowledge of laboratory work. Laboratory work was not completed. The design of the notebook for the laboratory work does not meet the requirements.

Evaluation criteria for the intermediate controls

Intermediate control is carried out in 2 times on materials of lecture, practical and laboratory studies.

1-intermediate control (20 points):

- F2F (10 points) – verification of the implementation of practical and laboratory works.

- Web-forums (10 points) – participations in web forums.

2-intermediate control (20 points):

- Test (20 points) – solve tests on discipline.

Evaluation criteria for the final controls

The final control is carried out in the form of the presentations at the end of the semester on the basis of lecture, practical and laboratory classes. The final control is assessed on a 5-point scale.

7. Basic and additional literature and sources of information

Basic literature

1. Rowell M.R. Handbook of wood and wood composites. Second edition. "CRC-Press". USA. 2013. 473 p.
2. Базарнова Н.Г. Химия древесины и ее компонентов. / г.Барнаул, "Азбука". 2002, 50 с.

3. Xabibullayev R.A., Ilhomov G'.U., Xabibullayev Sh.A. Yolg'och buyumlar texnologiyasi. Darslik. O'z.R OO'MTV/ T.: Cho'lpon nomidagi NMIU, 2014. 256 b.

Additional literature

1. Терентьева Э. П., Удовенко Н. К., Павлова Е. А. Химия древесины, целлюлозы и синтетических полимеров: учебное пособие/ СПбГТУРП. - СПб., 2014. Ч. 1. – 53 с.
2. Алиев Р.Г., Павлова Е.А., Тереньева Э.П., Удовенко Н.К. Химия древесины и синтетических полимеров: Структура и химия древесины и ее компонентов: учебное пособие/ СПбГТУРП. - СПб., 2011. Ч.2. – 37 с.
3. Махсудов Й.М. Полимер материаллари синашга оид практикum. 1982 йил.

Internet sites

1. <http://www.e-booksdirectory.com/listing.php?category=96>
2. <http://www.xumuk.ru/encyklopedia/2/4997.html>
3. <http://www.dissercat.com/content/khimiya-drevesiny-i-ee-osnovnykh-komponentov-khimicheskaya-aktivnost-komponentov-drevesiny-p>
4. <http://www.chem.msu.su/rus/jlib/cyr/306/welcome.html>
5. <http://lesnoizhurnal.narfu.ru/issuesarchive/>
6. http://www.libedu.ru/lb/azarov_v_i_burov_a_v_obolenskaja_a_v_himija_drevesiny_i_sinteticheskikh_polimerov.html
7. <http://www.tandfonline.com/toc/lwct20/36/6?nav=tocList>

