

**Thematic plan of seminars  
in the discipline Toxicological chemistry  
for students admitted in 2021 of the educational program  
specialist degree in the specialty of training 33.05.01  
Pharmacy direction (profile) Pharmacy,  
form of study full-time (face to face)  
for the 2024-2025 academic year**

№	Thematic blocks	Hours (academic)
	<b>7 semester</b>	<b>34</b>
1	Safety precautions in the chemical-toxicological laboratory. Chemical-toxicological analysis. Legal and methodological foundations of chemical-toxicological analysis.	2
2	Organization of forensic chemical expertise in the Russian Federation. The main documents regulating the work in the field of forensic chemical expertise.	2
3	Classification of poisons. Classification of poisonings. Physico-chemical characteristics of xenobiotics. Theories of toxicity. Stages of acute poisoning.	2
4	General patterns of behavior of xenobiotics in the body. Receipt, distribution, withdrawal. Factors affecting the distribution of xenobiotics in the body. Toxicokinetics. Basic toxicokinetic parameters of distribution	2
5	Biotransformation of xenobiotics in the body. Factors affecting the metabolism of xenobiotics.	2
6	Metabolites and toxicity. Lethal synthesis. Posthumous changes. Basic reactions of secondary metabolism.	2
7	Intermediate certification Control of knowledge, abilities, skills on the modular unit No. 1 "General issues of toxicological chemistry".	2
8	Chemical-toxicological analysis for a group of substances isolated by mineralization. Preparation of biological samples for research. Isolation methods. Mineralization technique. denitration of mineralizate.	2
9	Solution of the practical problem of detecting "metal poisons" in the mineralizate. Preparation of mineralizate for research. Precipitation of barium sulfate and lead. Analysis of the precipitate for barium ions. Detection of lead ions.	2
10	Mastering the analytical methods of ion separation using dithizone as a chelating agent. Analysis of the filtrate for manganese, chromium, and silver ions.	2
11	Analytical methods for the separation of metal ions using salts of diethyldithiocarbamic acid. Detection of zinc, cadmium, copper ions.	2
12	Detection of antimony, bismuth and thallium ions.	2
13	Research on arsenic. Writing an expert opinion.	2
14	A private method for the detection and determination of the mercury ion. Organic compounds of mercury.	2
15	Chemical-toxicological analysis of organic and inorganic fluorine compounds.	2
16	Carbon monoxide. Methods of chemical-toxicological analysis. Spectrophotometric determination of carboxyhemoglobin in blood.	2
17	Intermediate certification Control of knowledge, abilities, skills in modular unit No. 2 "Particular issues of toxicological chemistry" (Part 1). CTA of heavy metals, carbon monoxide, fluorine compounds	2

	<b>8 semester</b>	<b>72</b>
1	Safety precautions in the chemical-toxicological laboratory. Residual knowledge control.	2
	Chemical-toxicological analysis for a group of substances Isolated by distillation. "Flying" poisons. Features of isolation. Chemical-toxicological analysis of hydrocyanic acid derivatives.	2
2	Chemical-toxicological analysis of alcohols (methyl, ethyl, ethylene glycol, amyl alcohols). Examination of alcohol intoxication.	2
	Solution of the practical problem of detection of ethanol and higher alcohols in blood and urine by gas-liquid chromatography.	2
3	Chemical-toxicological analysis for a group of substances, Isolated by extraction. Pesticides.	2
	Chemical-toxicological analysis of organochlorine compounds (DDT, HCCH, heptachlor).	2
4	Chemical-toxicological analysis of organophosphorus compounds: thiophos, karbafos.	2
	Chemical-toxicological analysis of organophosphorus compounds chlorophos and other.	2
5	Chemical-toxicological analysis of carbamic acid derivatives.	2
	Chemical-toxicological analysis of synthetic pyrethroids.	2
6	Intermediate certification Control of knowledge, abilities, skills in module unit No. 2 "Particular issues of toxicological chemistry" (part 2). CTA of volatile poisons.	2
	Intermediate certification Control of knowledge, abilities, skills in module unit No. 2 "Particular issues of toxicological chemistry" (part 3). CTA of pesticides.	2

7	Chemical-toxicological analysis for a group of substances isolated by extraction and sorption.	2
	Isolation of medicinal substances – general and specific methods of isolation.	2
8	Chemical-toxicological analysis of barbituric acid derivatives.	2
	Toxicological significance, metabolism, objects of study, isolation. Identification, quantification, interpretation of results.	2
9	Chemical-toxicological analysis of opium alkaloids (morphine, codeine, heroin, etc.). Toxicological significance, metabolism, objects of study, isolation.	2
	Chemical-toxicological analysis of opium alkaloids (morphine, codeine, heroin, etc.). Identification, quantification, interpretation of results.	
10	Chemical-toxicological analysis of alkaloid derivatives of tropane and ecgonine. Toxicological significance, metabolism, objects of study, isolation.	2
	Chemical-toxicological analysis of alkaloid derivatives of tropane and ecgonine. Identification, quantification, interpretation of results.	2
11	Chemical-toxicological analysis of natural phenylalkylamines.	2
	Chemical-toxicological analysis of synthetic phenylalkylamines.	2
12	Chemical-toxicological analysis of 1,4-benzodiazepine derivatives by hydrolysis products.	2
	Chemical-toxicological analysis of 1,4-benzodiazepine derivatives by native substances.	2
13	Chemical-toxicological analysis of phenothiazine derivatives.	2
	Identification, quantification, interpretation of the results of phenothiazine derivatives.	2
14	Chemical-toxicological analysis of cannabinoids. Analytical diagnosis of drug intoxication with cannabinoids.	2
	Synthetic analogues of morphine (promedol, tramal, methadone, fentanyl)	2
15	Intermediate certification Control of knowledge, skills, skills in module unit No. 2 "Particular issues of toxicological chemistry" (part 4). CTA of poisons isolated by extraction and sorption.	2
	Solution of situational problems	2
16	Fundamentals of conducting a general (non-targeted) analysis of xenobiotics. TLC screening of xenobiotics.	2
	Immune methods for diagnosing acute poisoning and drug addiction.	2
17	Analytical diagnosis of drug addiction and substance abuse.	2
	Features of the analysis and interpretation of the results of the study in the diagnosis of drug addiction and substance abuse.	2
18	Analytical diagnosis of acute poisoning.	2
	.Features of the analysis and interpretation of the results of the study during the analytical diagnosis of acute poisoning.	2
	Interim certification	36
	Total	142

Considered at the meeting of the department of Pharmaceutical, Toxicological Chemistry Pharmacognosy and Botany on August 28, 2024, protocol No. 1

Head of the Department of Pharmaceutical and Toxicological Chemistry,

Pharmacognosy and Botany Professor



/Ozerov A. A./