Thematic plan of seminars
in the discipline " General pharmaceutical chemistry "
for students 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 2023-2024 academic year

№	Thematic blocks	Hours (academic)
	4 term	
1	Subject and tasks of pharmaceutical chemistry[1].	1.6
	Terminology in pharmaceutical chemistry, nomenclature. Classification of medicines[2].	2
2	Sources and methods of obtaining medicines[1]. Obtaining medicinal substances from plant and animal raw materials[2].	1.6
	Preparation of drugs based on biological synthesis. Obtaining medicinal substances from mineral raw materials and by organic synthesis[2].	2
3	Preconditions for the development of new drugs[1]. Reasons for creating new drugs[2].	1.6
	The main stages of research and development of drugs. Search and creation of substance-leaders. International standards[2].	2
4	Computer modeling of drugs[1]. Computer-aided drug design: early methods[2].	1.6
	Computer-aided drug design: newer methods[2].	2
5	State system for quality assurance of medicines[1]. Standardization of medicines[2].	1.6
	Validation. Concept and principles[2].	2
6	Metrology[1]. Basic concepts of metrolodgy[2].	1.6
	Metrological characteristics of the analysis results. Statistical processing of results[2].	2
7	Normative documents[1]**.** Russian State Pharmacopoeia[2].	1.6
	General Pharmacopoeia Chapter. Pharmacopoeia Monograph. Pharmacopoeia Monograph of the enterprise. National and regional pharmacopoeias[2].	2
8	**Control of knowledge, abilities, skills in thematic blocks 1-7** Solving test problems with a choice of answers	1.6
	Test work.	2
9	Purity of medicines. Impurities in medicines and their sources[1].	1.6
	Requirements for medicines[2].	2
10	Good manufacturing practice for medicinal products (GMP)[1].	1.6
	Types of control[2]	2
11	Quality control of medicines in pharmacies at all stages of product manufacturing and dispensing[1].	1.6
	Types of intra-pharmacy drug control[2]	2
12	Pharmacist-analyst of a pharmacy[1]. Professional and job	1.6

	requirements for a pharmacist-analyst of a pharmacy[2].	
	Equipment for the control and analytical room (table). Nomenclature of titrated solutions, reagents, indicators[2].	2
13	Pharmaceutical analysis[1].	1.6
	Common methods in pharmaceutical analysis[2]	2
14	Drug stability[1]. Stability tests[2].	1.6
	Establishment of expiration dates of medicinal substances[2]	2
15	Pharmaceutical incompatibility of medicines[1]. Classification[2].	1.6
	Chemical incompatibility of drugs[2].	2
16	**Control of knowledge, abilities, skills in thematic blocks 9-15** Solving test problems with a choice of answers.	1.6
	Test work.	2
Total for the term		58
	5 term	
17	Chemical methods for the analysis of pharmaceutical substances[1]. Classification of methods[2].	2.0
	Analysis criteria[2].	1.1
18	Chemical methods of pharmacopoeial analysis[1] - Identification of inorganic drugs[2]	1.1
	Identification of cations, anions[2]	2.0
19	Chemical methods of pharmacopoeial analysis[1] - identification of drugs of organic nature (identification of functional groups)[2].	1.6
	Identification of organoelement drugs[2].	1.5
20	Methods of testing for purity of medicinal substances[1].	1.1
	Purity tests on chemical properties. Impurities Inorganic ions[2].	2.0
21	Research work. Determining the purity of "Purified water"[1].	1.5
	Determination of impurities in service water[2].	1.6
22	Chemical methods of pharmacopoeial analysis - quantification of drugs[1]. Classification of methods[2].	1.6
	Quantification of drugs. Gravimetry[2].	1.5
23	Chemical methods of pharmacopoeial analysis - quantification of drugs. Titrimetric methods of analysis[1]. Classification. Requirements. Methods of titration[2].	1.5
	Preparation of titrated solutions by accurately weighed quantity and by Fixanal. Determination of the titre of the working solution. Equivalence point. Calculations[2].	1.6
24	Chemical methods of pharmacopoeial analysis - quantification of drugs. Neutralization[1]. Alkalimetry. Acidimetry[2].	1.5
	Determination of organic acids and bases. Non-aqueous titration[2]	1.6
25	Chemical methods of pharmacopoeial analysis - quantification of drugs. Precipitation titration. Argentometry[1]. Mohr's method[2].	1.5
	Precipitation titration. Argentometry. Folgard and Fayans methods[2].	1.6
26	**Control of knowledge, abilities, skills in thematic blocks 17-25** Solving test problems with a choice of answers	1.1
	Test work.	1.6
27	Chemical methods of pharmacopoeial analysis – precipitation titration. Mercurimetry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2].	1.6
	Mercurometry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2].	1.5

28	Chemical methods of pharmacopoeial analysis - quantification of drugs. Redox titration[1].	1.1
	Permanganatometry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2].	2.0
29	Chemical methods of pharmacopoeial analysis - quantification of drugs. Redox titration. Iodometry[1].	1.5
	Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2].	1.6
30	Chemical methods of pharmacopoeial analysis - quantification of drugs. Redox titration. Cerimetry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2].	1.6
	Bichromatometry. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2].	1.5
31	Chemical methods of pharmacopoeial analysis - quantification of drugs. Redox titration. Bromatometry[1].	1.5
	Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2].	1.6
32	Chemical methods of pharmacopoeial analysis - quantification of drugs. Redox titration. Nitritometry[1].	1.5
	Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2].	1.6
33	Chemical methods of pharmacopoeial analysis - quantification of drugs. Complexonometry[1]. Chemistry[2].	1.6
	Working solutions. Fixing the point of equivalence[2].	1.5
34	Elemental analysis. Characteristics, methods of decomposition of substances[1]. Method of combustion in a flask with oxygen[2].	1.5
	Determination of nitrogen in organic compounds. Kjeldahl method[2]	1.6
35	**Control of knowledge, abilities, skills in thematic blocks 27-34** Solving test problems with a choice of answers	1.1
	Test work.	1.5
Total for the term		58
6 term		
36	Viruses[1]. Classification. Life cycle[2].	2
	Features of chemotherapy for viral infections. Targets for antiviral agents[2].	1,6
37	Influenza virus[1]. Peculiarities of structure. Pathology. Neuraminidase inhibitors. General pharmaceutical analysis of anti-influenza drugs: oseltamivir, zanamivir[2].	2
	General pharmaceutical analysis of anti-influenza drugs: amantadine, remantadine, favipiravir[2].	1,6
37	HIV[1]. Structure, pathology. General pharmaceutical analysis of drugs for the treatment of HIV infection[2].	2
	Reverse transcriptase inhibitors (nucleoside analogues): zidovudine, stavudine, zalcitabine, didanosine, abacavir[2].	1,6
39	General pharmaceutical analysis of drugs for the treatment of HIV infection[1]. Non-nucleoside reverse transcriptase inhibitors: nevirapine[2].	2
	Nonnucleoside reverse transcriptase inhibitors: efavirenz, delavirdine[2].	1,6
40	General pharmaceutical analysis of drugs for the treatment of HIV infection[1]. Protease inhibitors: saquinavir, indinavir, ritonavir[2].	2

	Integrase inhibitors: raltegravir, dolutegravir, elvitegravir[2].	1,6
41	General pharmaceutical analysis of agents for the treatment of HIV infection[1]. Attachment and fusion inhibitors: maraviroc, enfuvirtide[2].	2
	Pharmacokinetic enhancers: cobicistat, ritonavir[2].	1,6
42	**Control of knowledge, abilities, skills in thematic blocks 36-41** Solving test problems with a choice of answers	2
	Test work.	1,6
43	Hepatitis B virus[1]. Structure, pathology[2].	2
	General pharmaceutical analysis of anti-hepatitis B drugs: ribavirin, lamivudine[2].	1,6
44	Hepatitis C virus[1]. Structure, pathology[2].	2
	General pharmaceutical analysis of anti-HCV drugs: sofosbuvir, daclatasvir, ledipasvir, velpatasvir[2].	1,6
45	Viruses of the family Herpesviridae[1]. Structure, pathology[2].	2
	General pharmaceutical analysis of anti-herpetic agents: iodoxuridine, acyclovir, valacyclovir, vidarabine, flacoside, chelepin D, poludan[2].	1,6
46	General pharmaceutical analysis of anticytomegalovirus drugs[1]: ganciclovir, foscarnet[2].	2
	General pharmaceutical analysis of anticytomegalovirus drugs: letermovir, maribavir[2].	1,6
47	Coronavirus. Structure, pathology[1].	2
	General pharmaceutical analysis of anticoronavirals: Remdisivir, halidesivir, and molnupiravir[2].	1,6
48	General pharmaceutical analysis of antiviral agents for various purposes[1]. Inhibitors of late viral protein synthesis - thiosemicarbazone derivatives: methisazone[2].	2
	Virus self-assembly inhibitors: rifampicin[2].	1,6
49	General pharmaceutical analysis of antiviral agents for various purposes[1]. Virucidal agents of local action: tetraoxotetrahydronaphthalene, tebrofen[2].	2
	Virucidal agents of local action: bromnaftoquinone, butaminophen[2].	1,6
50	General pharmaceutical analysis of antiviral agents for various purposes[1]. Interferons: interferon alpha, interferon alpha-2a, interferon alpha-2b (monocytic)[2].	2
	Interferon beta (fibroblast), interferon gamma-1b (T-lymphocyte); - interferonogens: umifenovir, tiloron[2].	1,6
51	**Control of knowledge, abilities, skills in thematic blocks 36-41** Solving test problems with a choice of answers	2
	Test work.	1,6
Total for the term		53
Total		**169**

[1] - Subject
[2] - Essential content (if necessary)

Considered at the meeting of the department of Pharmaceutical and Toxicological Chemistry "27" may 2023, protocol No9

Head of the Department  Ozerov A.A