**The thematic plan of seminar-type classes in the discipline "General pharmaceutical chemistry" for students enrolled in 2022 according to the educational program 33.05.01 Pharmacy, Pharmacy profile (specialty), the form of study is full-time for the 2024 – 2025 academic year**

| № | Thematic blocks | Hours (academic) |
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| 4 term | | |
| 1. | Safety precautions when working in the laboratory of pharmaceutical chemistry. Verification of residual knowledge[1]. | 2 |
| | Fundamentals of legislation[1].Terminology in pharmaceutical chemistry, nomenclature. Methodological foundations of the classification of medicines. Classification of medicines[2]. | 2 |
| 2. | Medicinal products of plant, animal, and microbial origin[1]. | 2 |
| | Medicinal products of mineral and synthetic origin[2]. | 2 |
| 3. | The reasons for the creation of new medicines[1]. The main stages of research and development of medicines. International standards[2]. | 2 |
| | Search and design of medicinal substances-leaders[2]. | 2 |
| 4. | Computer modeling as a method of designing medicines. Targeted design of new drugs[1]. | 2 |
| | The construction of new molecular structures with specified properties – drug design[2]. | 2 |
| 5. | The quality assurance system of medicines[1]. | 2 |
| | Standardization of medicines. Validation[2]. | 2 |
| 6. | Basic concepts of metrology[1]. | 2 |
| | Metrological characteristics of the analysis results. Statistical processing of the results[2]. | 2 |
| 7. | The State Pharmacopoeia. General pharmacopoeia articles, pharmacopoeia articles and pharmacopoeia articles of the enterprise[1]. | 2 |
| | National and regional pharmacopoeias[2]. | 2 |
| 8. | Solving test problems. | 2 |
| | Control of knowledge, abilities, skills in thematic blocks 1-7. | 2 |
| 9. | Requirements for medicines[1]. | 2 |
| | Impurities in medicines and their sources[2]. | 2 |
| 10. | Quality control of medicines at all stages of manufacture, | 2 |

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| | storage and transportation[1]. | |
| | Types of control[2]. | 2 |
| 11. | Quality control of medicines in pharmacies at all stages of production and distribution[1]. | 2 |
| | Types of intra-pharmacy drug control2 | 2 |
| 12. | The procedure and features of intra-pharmacy quality control of medicines[1]. | 2 |
| | Professional and job requirements for a pharmacist-analyst of a pharmacy[2]. | 2 |
| 13. | Equipment for the control and analytical room (table)[1]. | 2 |
| | Nomenclature of titrated solutions, reagents, indicators[2]. | 2 |
| 14. | Pharmaceutical analysis[1]. Features of pharmaceutical analysis[2]. | 2 |
| | The types of activities carried out during the pharmaceutical analysis[2]. | 2 |
| 15. | Physical methods of drug testing[1]. | 2 |
| | General principles of working with equipment (hydrometers, pycnometers, refractometers)[2]. | 2 |
| 16. | Pharmacopoeia analysis[1]. Two areas of expertise[2]. | 2 |
| | General research methods. Special research methods[2]. | 2 |
| 17. | Incompatible combinations of medicines[1]. | 2 |
| | Types of incompatible combinations of medicines. Ways to overcome various types of incompatible combinations of medicines[2]. | 2 |
| 18. | Solving test problems. | 2 |
| | Control of knowledge, abilities, skills in thematic blocks 9-17. | 2 |
| | 5 term | |
| 1. | Safety precautions when working in the laboratory of pharmaceutical chemistry. Verification of residual knowledge[1]. | 2 |
| | Chemical methods for the analysis of medicinal substances[1]. Classification of methods. Analysis criteria[2]. | 2 |
| 2. | Chemical methods of pharmacopoeial analysis – Identification of inorganic drugs[1]. | 2 |
| | Identification of cations of drugs of inorganic nature[2]. | 2 |
| 3. | Chemical methods of pharmacopoeial analysis – Identification of inorganic drugs[1]. | 2 |
| | Identification of anions of medicinal products of inorganic nature[2]. | 2 |
| 4. | Chemical methods of pharmacopoeial analysis – identification of drugs of organic nature (identification of functional groups)[1]. | 2 |
| | Identification of the primary aromatic group. Identification of the aromatic nitro group[2]. | 2 |

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| 5. | Chemical methods of pharmacopoeial analysis – identification of drugs of organic nature (identification of functional groups)[1]. | 2 |
| | Identification of the hydroxyl group. Identification of aldehyde and ketogroups[2]. | 2 |
| 6. | Chemical methods of pharmacopoeial analysis – identification of drugs of organic nature (identification of functional groups)[1]. | 2 |
| | Identification of carboxyl, ester and amide groups[2]. | 2 |
| 7. | Chemical methods of pharmacopoeial analysis – identification of drugs of organic nature (identification of functional groups)[1]. | 2 |
| | Identification of organoelement drugs[2]. | 2 |
| 8. | Solving test problems. | 2 |
| | Control of knowledge, abilities, skills in thematic blocks 1-7. | 2 |
| 9. | Methods of testing the purity of medicinal substances[1]. | 2 |
| | Chemical purity tests[1]. Impurities of inorganic ions. Impurities of heavy metals. Arsenic impurities[2]. | 2 |
| 10. | Research work. Determining the purity of "Purified water"[1]. | 2 |
| | Determination of impurities in service water[2]. | 2 |
| 11. | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Classification of methods[2]. | 2 |
| | Quantitative assessment of medicines[1]. Gravimetry[2]. | 2 |
| 12. | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Titrimetric methods of analysis. Classification. Requirements. Methods of titration[2]. | 2 |
| | Preparation of titrated solutions by accurately weighed quantity and by Fixanal. Determination of the titre of the working solution. Equivalence point. Calculations[2]. | 2 |
| 13. | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Neutralization. Alkalimetry. Acidimetry[2]. | 2 |
| | Determination of organic acids and bases[1]. Non-aqueous titration[2]. | 2 |
| 14. | Precipitation titration[1]. Argentometry. Mohr's method[2]. | 2 |
| | Precipitation titration[1]. Argentometry. Folgard and Fayans methods[2]. | 2 |
| 15. | Chemical methods of pharmacopoeial analysis – precipitation titration[1]. | 2 |
| | Mercurometry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2]. | 2 |
| 16. | Chemical methods of pharmacopoeial analysis - quantification of drugs. Complexonometry[1]. Chemistry[2]. | 2 |

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| | Complexonometry[1]. Working solutions. Fixing the point of equivalence[2]. | 2 |
| 17. | Elemental analysis[1]. Characteristics, methods of decomposition of substances. Method of combustion in a flask with oxygen[2]. | 2 |
| | Determination of nitrogen in organic compounds[1]. Kjeldahl method[2]. | 2 |
| 18. | Solving test problems. | 2 |
| | Control of knowledge, abilities, skills in thematic blocks 9-17. | 2 |
| 19. | Control of the level of formation of practical skills and abilities. | 2 |
| | Control of the level of formation of practical skills and abilities. | 2 |
| 6 term | | |
| 1. | Safety precautions when working in the laboratory of pharmaceutical chemistry. Verification of residual knowledge[1]. | 1 |
| | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Redox titration. Permanganatometry. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2]. | 1 |
| 2. | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Redox titration[2]. | 1 |
| | Cerimetry. Bichromatometry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2]. | 1 |
| 3. | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Redox titration[2]. | 1 |
| | Bromatometry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2]. | 1 |
| 4. | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Redox titration[2]. | 1 |
| | Iodometry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2]. | 1 |
| 5. | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Redox titration[2]. | 1 |
| | Iodochlorometry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2]. | 1 |
| 6. | Chemical methods of pharmacopoeial analysis – quantitative assessment of medicines[1]. Redox titration[2]. | 1 |
| | Nitritometry[1]. Titration conditions, working solution, indicator. Advantages and disadvantages of the method[2]. | 1 |
| 7. | Solving test problems. | 1 |

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| | Control of knowledge, abilities, skills in thematic blocks 1-6. | 1 |
| 8. | Viruses. Classification. Life cycle[1]. | 1 |
| | Features of chemotherapy for viral infections. Targets for antiviral agents[2]. | 1 |
| 9. | HIV[1]. Structure, pathology. General pharmaceutical analysis of drugs for the treatment of HIV infection[2]. | 1 |
| | Attachment and fusion inhibitors: maraviroc, enfuvirtide[1]. Pharmacokinetic enhancers: cobicistat, ritonavir[2]. | 1 |
| 10. | General pharmaceutical analysis of drugs for the treatment of HIV infection[1]. Reverse transcriptase inhibitors[2]. | 1 |
| | Reverse transcriptase inhibitors (nucleoside analogues): zidovudine, stavudine, zalcitabine, didanosine, abacavir. Nonnucleoside reverse transcriptase inhibitors: efavirenz, delavirdine[2]. | 1 |
| 11. | General pharmaceutical analysis of drugs for the treatment of HIV infection[1]. Protease inhibitors: saquinavir, indinavir, ritonavir[2]. | 1 |
| | General pharmaceutical analysis of drugs for the treatment of HIV infection[1]. Integrase inhibitors: raltegravir, dolutegravir, elvitegravir[2]. | 1 |
| 12. | Influenza virus[1]. Peculiarities of structure. Pathology. Neuraminidase inhibitors. General pharmaceutical analysis of anti-influenza drugs: oseltamivir, zanamivir[2]. | 1 |
| | General pharmaceutical analysis of anti-influenza drugs: amantadine, remantadine, favipiravir[2]. | 1 |
| 13. | Coronavirus[1]. Structure, pathology[2]. | 1 |
| | General pharmaceutical analysis of anticoronavirus drugs: remdisivir, halidesivir, and molnupiravir[2]. | 1 |
| 14. | Hepatitis B virus[1]. Structure, pathology[2]. | 1 |
| | General pharmaceutical analysis of anti-hepatitis B drugs: ribavirin, lamivudine[2]. | 1 |
| 15. | Hepatitis C virus[1]. Structure, pathology[2]. | 1 |
| | General pharmaceutical analysis of anti-hepatitis C drugs: sofosbuvir, daclatasvir, ledipasvir, velpatasvir[2]. | 1 |
| 16. | Viruses of the family Herpesviridae[1]. Structure, pathology[2]. | 1 |
| | General pharmaceutical analysis of anti-herpetic agents: iodoxuridine, acyclovir, valacyclovir, vidarabine, flacoside, chelepin D, poludan[2]. | 1 |
| 17. | Cytomegalovirus[1]. General pharmaceutical analysis of anticytomegalovirus drugs: ganciclovir, foscarnet[2]. | 1 |
| | General pharmaceutical analysis of anticytomegalovirus drugs: letermovir, maribavir[2]. | 1 |
| 18. | Solving test problems. | 1 |

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| | Control of knowledge, abilities, skills in thematic blocks 8-17. | 1 |
| | Intermediate certification | 36 |
| | Total | 220 |

[1] - Subject
[2] - Essential content

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