**Kazakh National University named Al-Farabi**

**Department of Chemistry and Chemical Technology**

**Department of Chemistry and Technology of Organic Substances, Natural Compounds and Polymers**

**SILLABUS**

Autumn semester, 2022- Academic Year 2023, 4th Year

**Academic Course Information**

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| Discipline  Code | Discipline  name | IWS | Number of hours | | | Amount of credits | IWST | |
| Lec. | Prac. | Lab. |
| OF 4223 | Fundamentals of Pharmacology | 98 | 15 | 30 | - | 5 | 7 | |
| Lector | Satbaeva Elmira Maratovna,  PhD, Associate Professor | | | | | | | |
| e-mail | e.satbaeva@ mail.ru | | | | | Office - hours | | Scheduled |
| Telephone | +7 707 212 2866 | | | | | Classroom  516 | |
| Academic presentation of the course | **Type of training course:** The course "Fundamentals of Pharmacology" is an optional component in the educational program of the bachelor's degree in the specialty "6B072 - Technology of pharmaceutical production".  **The purpose of the discipline:** to form the ability to determine the safety of the use of drugs and their therapeutic efficacy.  In the course of studying the course, to form students' abilities:  - to demonstrate an understanding of the principles of drug safety and their therapeutic efficacy in diseases;  - to explain the therapeutic effect of registered medicinal products on a living organism and the need to search for new effective medicinal products;  - to form an understanding of the rational use of medicinal products in compliance with the rules of their administration and dosage characteristics;  - to compare the main pharmacological effects, indications and contraindications for the use of medicinal products, the rules for their dispensing from the pharmacy, storage and expiration dates;  - to reasonably present the conducted studies on the safety of medicinal products and their effectiveness during scientific presentations. | | | | | | | |
| Prerequisite | Physiology and fundamentals of anatomy, fundamentals of pharmaceutical technology | | | | | | | |
| Postrequisite | Industrial practice, pre-graduation practice | | | | | | | |
| Informational resources | **Educational literature:**  1. Alyautdin R.N. Pharmacology. 4th ed. "GEOTAR-MEDIA". - 2013 .-- S. 237-266.  2. Kharkevich D.A. Pharmacology: Textbook. - 11th ed. - M .: GEOTAR - Media, 2015 .-- 760 p.  3. Mashkovsky M.D. Medicines. - 16th ed. - M .: Novaya Volna, 2012. - 1216 p.  4. Guide to laboratory studies in pharmacology / Ed. YES. Kharkevich, "GEOTAR-MEDIA", 2012. - pp. 125-129; 137-145.  5. A.I. Vengerovsky Lectures on pharmacology for doctors and pharmacists. - Study guide - GEOTAR-Media. 2012. - S. 248-300.  **Internet resources:**  <http://knf.kz/index.php/ru/>  <https://www.ndda.kz/>  <https://www.rlsnet.ru/>  [**https://www.booksmed.com/**](https://www.booksmed.com/) | | | | | | | |
| Academic policy of the course in the context of  university moral and ethical values. | **Rules of academic conduct:**  Mandatory attendance at classes, no tardiness. Absence and lateness for classes without prior warning of the teacher are estimated at 0 points.  Obligatory adherence to the deadlines for completing and submitting assignments (IWS, midterm assignments, homework assignments, control, laboratory classes, etc.), projects, exams. In case of violation of the deadlines, the completed task is evaluated taking into account the deduction of penalty points.  **Academic values: academic** honesty and integrity: independence in all assignments; inadmissibility of plagiarism, forgery, the use of cheat sheets, cheating at all stages of knowledge control, deception of the teacher and disrespectful attitude towards him (KazNU student code of honor).  Students with disabilities can receive advice by e-mail: e.satbaeva @ mail.ru and by phone: +7 707 212 2866. | | | | | | | |
| Assessment and attestation policy | **Criteria assessment:** assessment of learning outcomes in relation to descriptors (checking the formation of competencies at midterm control and exams).  **Summative assessment:** assessment according to the formula for calculating the final grade | | | | | | | |
| Help: for advice on the implementation of independent work (IWS), their delivery and protection, as well as for additional information on the material covered and all other emerging questions about the course being taught, contact the teacher during his office hours (IWST). | | | | | | | |

**The calendar of the implementation of the content of the training course:**

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| --- | --- | --- | --- |
| Week / Date | Topic title (lecture, laboratory, seminars, IWST) | Number of hours | Max.score |
| 1 | 2 |  |  |
| 1 | **Lecture 1.** Introduction to the discipline. Subject, objects and methods of pharmacology. Place of discipline in the specialty "Technology of pharmaceutical production". | 1 |  |
| **Practical lesson 1.** Consideration of sources of obtaining medicines. Stages of drug development. The concept of original and generic drugs. Official and bulk dosage forms. Basic terms in pharmacology and prescription | 2 | 10 |
| 2 | **Lecture 2.** General prescription. Recipe structure. Rules for prescribing medicines. Dosage forms**.** | 1 |  |
| **Practical lesson 2**. Fulfillment of practical tasks on hard and soft dosage forms. Features of prescribing and manufacturing solid dosage forms. Peculiarities of prescribing main dosage forms. Calculations of the doses of ingredients. | 2 | 10 |
| 3 | **Lecture 3.** Normative legal acts regulating the prescription, storage and dispensing of drugs. Pharmacopoeia**.** | 1 |  |
| **Practical lesson 3.** Fulfillment of practical tasks on liquid dosage forms. Solutions for injection. Features of prescribing liquid dosage forms. Calculations of doses of the main and auxiliary substances of the main recipes. Writing out ampoules and vials. | 2 | 10 |
| **IWST - 1:** Delivery of the task IWS # 1. "Dosage forms with prolonged release" |  | 15 |
| 4 | **Lecture 4.** Pharmacokinetics of drugs. Basic concepts. | 1 |  |
| **Practical lesson 4**. Fulfillment of practical tasks on the routes of drug administration, advantages and disadvantages. Absorption, distribution and elimination of drugs. Basic pharmacokinetic parameters. | 2 | 10 |
| 5 | **Lecture 5.** Pharmacodynamics of drugs | 1 |  |
| **Practical lesson 5**. Fulfillment of practical tasks on the targets of drug action. Types of receptors. Mechanisms and localization of drug action. Repeated and combined use of drugs. Drug interaction. | 2 | 10 |
| **Examination on the topic:** Pharmacokinetics and pharmacodynamics of drugs |  | 20 |
| **IWST - 2.** Delivery of the task IWS # 2. "Factors affecting the pharmacokinetics and pharmacodynamics of drugs." |  | 15 |
| **MC-1** |  | **100** |
| 6 | **Lecture 6.** Anti-inflammatory drugs. The pathogenesis of the inflammatory process. Classification and mechanisms of action of anti-inflammatory drugs. | 1 |  |
| **Practical lesson 6.** Fulfillment of practical tasks on steroid and non-steroidal anti-inflammatory drugs. Pharmacological effects, undesirable side reactions, indications for use, comparative characteristics of drugs. | 2 | 10 |
| **IWST - 3.** Delivery of the task IWS #3 "Biopreparations and biosimilars" |  | 15 |
| 7 | **Lecture 7.** Pathogenesis of allergic reactions of immediate and delayed type. Antiallergic drugs. Classification and mechanisms of their action. | 1 |  |
| **Practical lesson 7.** Fulfillment of practical tasks on antihistamines. Membrane stabilizing antiallergic agents. Drugs affecting the leukotriene system. Pharmacological effects, undesirable side reactions, indications for use, comparative characteristics of drugs**.** | 2 | 10 |
| **IWST#-4.** Delivery of the task of IWS # 4 "Immunosuppressants**"** |  | 15 |
| 8 | **Lecture 8.** Nociceptive and antinociceptive systems. Analgesics, their difference from local anesthetics. Classification and mechanisms of action. | 1 |  |
| **Practical lesson 8.** Fulfillment of practical tasks on narcotic and non-narcotic analgesics. Pharmacological effects, undesirable side reactions, indications for use, comparative characteristics of drugs. Basic principles of treatment of acute drug poisoning. | 2 | 10 |
| 9 | **Lecture 9.** Diseases of the gastrointestinal tract, pathogenesis. Medicines affecting the functions of the digestive system. Their classification and mechanisms of action. | 1 |  |
| **Practical lesson 9.** Fulfillment of practical tasks on antisecretory drugs. Laxatives. Enzyme preparations. Hepatoprotectors, choleretic agents. | 2 | 10 |
| **IWST - 5.** Delivery of the task IWS #. 5 "Means used in diabetes mellitus" |  | 10 |
| 10 | **Lecture 10.** Drugs used in emergency conditions (anaphylactic shock, acute coronary insufficiency, bronchospasm, hypertensive crisis, hyper- and hypoglycemic coma). | 1 |  |
| **Practical lesson 10**. Fulfillment of practical tasks on the means of urgent therapy: pharmacological effects, undesirable side reactions, indications for use. | 2 | 10 |
| **Examination. Test** |  | 10 |
| **МТ-1** |  | **100** |
| 11 | **Lecture 11.** Antimicrobial agents. Classification. Basic principles of prescribing antibacterial agents. | 1 |  |
| **Practical lesson 11.** Implementation of practical tasks on beta-lactam antibiotics. Mechanism and type of action, spectrum of action, side effects and indications for use. | 2 | 10 |
| 12 | **Lecture 12.** Antibiotics - principles of prescription and choice. Antibiotic resistance. | 1 |  |
| **Practical lesson 12.** Performing practical tasks on the topic: “Antibiotics - macrolides, tetracyclines, aminoglycosides, chloramphenicol, glycopeptides, lincosamides. Mechanism and type of action, spectrum of action, side effects and indications for use. | 2 | 10 |
| 13 | **Lecture 13** Synthetic antimicrobial agents. | 1 |  |
| **Practical lesson 13.** Fulfillment of practical tasks on sulfanilamide drugs. Synthetic antimicrobial agents of various chemical structures. The mechanism and type of their action, spectrum of action, side effects and indications for use. | 2 | 10 |
| **IWST 6.** Delivery of the task IWS # 6. "Antiseptics and disinfectants". |  | 15 |
| 14 | **Lecture 14.** Principles of prescribing and choosing antifungal and antiviral agents. Classification. | 1 |  |
| **Practical lesson 14.** Fulfillment of practical tasks on anti-fungal and antiviral agents. Comparative characteristics of drugs. Mechanism and type of action, spectrum of action, side effects and indications for use. | 2 | 10 |
| 15 | **Lecture 15.** Etiopathogenesis of tuberculosis. Principles of tuberculosis treatment. Classification of anti-tuberculosis drugs | 1 |  |
| **Practical lesson 15.** Implementation of practical tasks on anti-tuberculosis drugs. Classification. Mechanisms and type of action, spectrum of action, comparative characteristics of drugs, side effects. | 2 | 10 |
| **IWST-7.** Delivery of the task IWS# 7. Anthelmintic drugs. |  | 15 |
| **Examination. Test** |  | 20 |
| **MC-2** |  | **100** |
| **Exam** |  | **100** |

Chair of the method bureau

of the faculty \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mangazbayeva R.A.

Head of the department \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Moon G.A.

Teacher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Satbaeva E.M.