Appendix number 1.5 to The Rector UR Resolution No. 12/2019

SYLLABUS

**concerning the cycle of education 2022-2028**

(date range)

* 1. BASIC INFORMATION CONCERNING THIS SUBJECT / MODULE

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| --- | --- |
| Subject / Module | Pharmacology with toxicology |
| Course code / module \* | Fm/C |
| Faculty of (name of the leading direction) | College of Medical Sciences, University of Rzeszów |
| Department Name | College of Medical Sciences, University of Rzeszów |
| Field of study | medical direction |
| Level of education | uniform master's studies |
| Profile | practical |
| Form of study | stationary / extramural |
| Year and semester | year III, semester VI, year IV, semester VII, VIII |
| Type of course | obligatory |
| Coordinator |  |
| First and Last Name of the Teacher |  |

\* - According to the resolutions of the Faculty of Medicine

1.2. Forms of classes, number of hours and ECTS

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Semester | Lecture | Exercise | Conversation | Laboratory | Seminar | ZP | Practical | Self-learning | **Number of points ECTS** |
| VI | 30 | 30 | - | - | - | - | - | - | **4** |
| VII | 15 | 30 | - | - | - | - | - | - | **4** |
| VIII | 15 | 30 | - | - | - | - | - | - | **4** |

1.3. The form of class activities

☒classes are in the traditional form

☐classes are implemented using methods and techniques of distance learning

1.4. Examination Forms / module (exam, credit with grade or credit without grade)

2. REQUIREMENTS

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| Basics of knowledge in the field of anatomy, physiology, biochemistry, microbiology and pathology.  Knowledge, skills and competences of the above subjects according to the program of studies of the first, second and third year. |

**3. OBJECTIVES, OUTCOMES, AND PROGRAM CONTENT USED IN TEACHING METHODS**

* 1. Objectives of this course/module

|  |  |
| --- | --- |
| C1 | Acquisition of knowledge by the student on the pharmacological action of drugs, indications and contraindications to their use, side effects and interactions between drugs used in the therapy of various diseases |
| C2 | Understanding the mechanisms of action of drugs, their fate in the body and interaction |
| C3 | Acquisition of knowledge and skills to recognize and properly respond to adverse and toxic drug reactions |
| C4 | The acquisition of the ability to use the sources of information about medicines correctly (databases, characteristics of publications) and to interpret the knowledge contained therein |
| C5 | Obtain basic knowledge about the separateness of pharmacotherapy of children, the elderly, pregnant women and patients with liver and kidney damage and the ability to modify drug doses in these conditions |
| C6 | Substantive preparation and shaping of the student's attitude to use knowledge about medicines in clinical practice |
| C7 | Acquiring the ability to save ready-made and prescription drugs |
| C8 | Acquisition of knowledge and skills in the field of treatment of life-threatening conditions |

3.2 OUTCOMES FOR THE COURSE / MODULE (TO BE COMPLETED BY THE COORDINATOR)

|  |  |  |
| --- | --- | --- |
| EK (the effect of education) | The content of the learning effect defined for the subject (module) | Reference to directional effects (KEK) |
| EK­\_01 | characterizes individual groups of therapeutic agents, | C.W34. |
| EK\_02 | knows the main mechanisms of action of drugs and their changes in the system depending on age, | C.W35. |
| EK\_03 | determines the influence of disease processes on the metabolism and elimination of medicines, | C.W36. |
| EK\_04 | knows the basic rules of pharmacotherapy, | C.W37. |
| EK\_05 | knows the more important side effects of medicines, including those resulting from their interaction, | C.W38. |
| EK\_06 | understands the problem of drug resistance, including multidrug drug resistance | C.W39. |
| EK\_07 | knows the indications for genetic tests carried out to individualize pharmacotherapy, | C.W40. |
| EK\_08 | knows the group of drugs whose abuse can lead to poisoning, | C.W43. |
| EK\_09 | performs simple pharmacokinetic calculations, | C.U13. |
| EK\_10 | selects drugs at appropriate doses to correct pathological phenomena in the body and in particular organs, | C.U14. |
| EK\_11 | designs a scheme of rational chemotherapy, empiric and targeted, | C.U15. |
| EK\_12 | correctly prepares records of all forms of prescription medicinal substances, | C.U16. |
| EK\_13 | uses pharmaceutical guides and databases on medicinal products, | C.U17. |
| EK\_14 | knows the rules of pharmaceutical law, | G.W11. |
| EK\_15 | recognizes the symptoms of drug dependence and proposes therapeutic treatment, | E.U19. |
| EK\_16 | interprets the pharmaceutical characteristics of medicinal products and critically assesses advertising materials regarding medicines, | E.U31. |

**3.3 CONTENT CURRICULUM (filled by the coordinator)**

1. **Lectures**

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| **Course contents** |
| 1. Introduction to pharmacology. Basics of pharmacokinetics. Interactions between drugs.  2. Basics of pharmacodynamics. Mechanisms of drug action.  3. Pharmacogenetics.  4. Adverse reactions and drug toxicity.  5. The rules of treatment of microbial infections. Antibiotics, part 1  6. Antibiotics, part 2. Sulfonamides. Other antibacterial agents.  7. Antiviral drugs.  8. Antifungal, tuberculosis and antiparasitic drugs.  9. Drugs used in the treatment of migraines. Antihistamines.  10. Principles of anti-cancer therapy. Antineoplastic agents. |

**B**. **Exercise**

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| **Course contents** |
| 1. Basic information about the medicine. Sources of information about medicines. General recipe. Elements of a medical prescription. Rules for writing prescriptions. Types of drugs and their forms. Drug naming. Drug delivery routes. Dosage of medicines. Solid medications (powders, tablets, capsules, dragees, granules, globules, suppositories). Long-acting medicines, modified-release drugs.  2. The process of creating new medicines. Clinical trials of the drug. Pharmacokinetics (absorption, distribution, metabolism and elimination of the drug). Transport of drugs through the membranes. Liquid medicines (solutions, drops, rinsing, suspensions, syrups).  3. Pharmacogenetics. Mechanisms of drug action. Receptors and their types. Liquid medicines for injections and infusions.  4. Adverse reactions and drug toxicity. Disinfectants and disinfectants. Soft drugs (masculine, creams, pastes, liniments).  5. Dermatologicals. Sera. Immunoglobulin. Vaccines. Other forms of drugs (sprays, inhalers, emulsions, patches).  6. Non-prescription drugs. Supplements. Micronutrients. Vitamins. Medicines of vegetable origin. Repetition of the recipe.  7. Test from the recipe. Principles of treatment of microbial infections. Antimicrobial agents (classification, mechanisms of action, bacterial resistance to drugs).  8. Beta-lactam antibiotics (penicillins, cephalosporins, carbapenems, monobactams). Aminoglycosides. Glycopeptide antibiotics.  9. Tetracycline. Macrolides. Lincosamides. Polymyxin. Other antibacterial agents. Sulfonamides. Trimethoprim-sulfamethoxazole. Quinolones. Other medicines used in urinary tract infections.  Test I (material from exercises 1-9).  10. Antituberculous drugs. Principles of tuberculosis treatment.  11. Antiviral drugs.  12. Antifungal drugs. Drugs used in parasitic infections.  13. Antineoplastic agents. Immunosuppressive and immunostimulating drugs.  14. Amine autoidids. Drugs used to treat migraines. Antihistamines. Drugs acting on the serotoninergic system. Peptide autacids. Purine autokoidy.  15. Repetition of semester I.  Test II (material from exercises 10-14). |

**3.4 TEACHING METHODS**

Lecture: Problem and information lecture with multimedia presentation.

Exercises: Working in groups. Solving tasks and clinical problems. Discussion. Analysis of clinical cases. Working with a database. Preparing a presentation.

4 METHODS AND EVALUATION CRITERIA

4.1 Methods of verification of learning outcomes

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| --- | --- | --- |
| Symbol of effect | Methods of assessment of learning outcomes (Eg.: tests, oral exams, written exams, project reports, observations during classes) | Form of classes |
| EK\_1 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_2 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_3 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_4 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_5 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_6 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_7 | colloquium, written exam | Lecture, Exercises |
| EK\_8 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_9 | test exam, written test | Exercises |
| EK\_10 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_11 | oral answer, colloquium, test exam | Lecture, Exercises |
| EK\_12 | oral answer, colloquium, test exam | Exercises |
| EK\_13 | oral answer, presentation | Exercises |
| EK\_14 | Oral answer | Exercises |
| EK\_15 | oral answer, colloquium, test exam, | Lecture, Exercises |
| EK\_16 | Oral answer | Exercises |

4.2 Conditions for completing the course (evaluation criteria)

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| The condition for passing the subject is:  - presence on all exercises and attendance at lectures  - demonstration of knowledge and skills at least on a sufficient level as regards the material in accordance with the program (see substantive content)  - demonstrating skills of critical analysis of acquired information and application of pharmacological knowledge in contact with the patient  - getting at least a satisfactory grade from passing the final subject  Assessment from passing will be the resultant of all learning outcomes, i.e. knowledge, skills and social competences of the student, and will be based on internal regulations, which assumes collecting partial points of students. The point score will include oral answers, written tests (eg in terms of recipes), final tests (minimum two per semester), assessment of activity (assessment of competences and attitudes). The condition for passing the course and joining the semester 7 and the final exam will be obtaining the minimum number of points determined in the regulations. The final mark in the semester will depend on the number of points obtained. Students who do not get the required minimum number of points will not be able to take part in semester 7 and final exam and will have to pass all the material in the form of a test. |

5. Total student workload required to achieve the desired result in hours and ECTS credits

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| --- | --- |
| Activity | Hours / student work |
| Hours of classes according to plan with the teacher | 30 |
| Preparation for classes | 30 |
| Participation in the consultations | - |
| The time to write a paper / essay | - |
| Preparation for tests | 30 |
| Participation in colloquia | - |
| Other (e-learning) | - |
| SUM OF HOURS | 90 |
| TOTAL NUMBER OF ECTS | **12** |

6. TRAINING PRACTICES IN THE SUBJECT / MODUL

|  |  |
| --- | --- |
| Number of hours |  |
| Rules and forms of apprenticeship |  |

1. LITERATURE

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| **READING:**   1. Brenner G. M., Stevens C. W., Farmakologia, 2010 2. Wielosz M., Receptura dla studentów medycyny i stomatologii, 1998 |
| Additional literature:   1. Wojciech K., Zbigniew H., Farmakologia - podstawy farmakoterapii. Tom I i II, 2004 2. Katzung B.G., Masters S.B., Trezor A.J., pod red. Buczko W., Farmakologia ogólna i kliniczna, Tom I i II, 2012 3. Mutschler E., Geisslinger G., Kroemer H.K, Ruth P., pod red. Buczko W., Farmakologia i toksykologia Mutschlera, 2012 4. Rang H.P., Dale M.M., Ritter J.M., pod red. Mirowska D., Farmakologia Rang i Dale, 2014 5. Korbut R., Olszanecki R., Wołkow P., Jawień J., Farmakologia, 2012 6. Brunton L.L., Lazo J.S., Parker K.L. pod red. Buczko W., Farmakologia Goodmana & Gilmana. Tom I i II, 2007 7. Petrusewicz J., Gągało I., Hać E., Strzałkowska-Grad H., Farmakologia: zbiór pytań testowych dla studentów medycyny i stomatologii, 2002 8. Nowak P, Herman Z.S., Brus R., Receptura dla lekarzy, studentów medycyny i stomatologii, 2005 9. Danysz A., Buczko W., Kompendium farmakologii i farmakoterapii. Podręcznik dla studentów medycyny, 2008 |

Acceptance Unit Manager or authorized person