

**SYLLABUS**  
**concerning the cycle of education 2020-2026**  
(date range)

**1.1. BASIC INFORMATION CONCERNING THIS SUBJECT / MODULE**

Subject / Module	<b>Pharmacology</b>
Course code / module *	<b>Fm/C</b>
Faculty of (name of the leading direction)	<b>Medical College of Rzeszów University</b>
Department Name	<b>Medical College of Rzeszów University</b>
Field of study	<b>medical direction</b>
Level of education	<b>uniform master's studies</b>
Profile	<b>practical</b>
Form of study	<b>stationary / extramural</b>
Year and semester	<b>year III, semester VI</b>
Type of course	<b>obligatory</b>
Coordinator	<b>prof. dr hab. n. med. Piotr Tutka</b>
First and Last Name of the Teacher	<b>prof. dr hab. n. med. Piotr Tutka</b> <b>mgr farm. Patrycjusz Kołodziejczyk</b>

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

**1.2. Forms of classes, number of hours and ECTS**

Lecture	Exercise	Conversation	Laboratory	Seminar	ZP	Practical	Self-learning	Number of points ECTS
15	15							<b>3</b>

**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**

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**

### 3.1. 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)

#### A. Lectures

Course contents
<ol style="list-style-type: none"> <li>1. Introduction to pharmacology. Basics of pharmacokinetics. Interactions between drugs.</li> <li>2. Basics of pharmacodynamics. Mechanisms of drug action.</li> <li>3. Pharmacogenetics.</li> <li>4. Adverse reactions and drug toxicity.</li> <li>5. The rules of treatment of microbial infections. Antibiotics, part 1</li> <li>6. Antibiotics, part 2. Sulfonamides. Other antibacterial agents.</li> <li>7. Antiviral drugs.</li> <li>8. Antifungal, tuberculosis and antiparasitic drugs.</li> <li>9. Drugs used in the treatment of migraines. Antihistamines.</li> <li>10. Principles of anti-cancer therapy. Antineoplastic agents.</li> </ol>

#### B. Exercise

Course contents
<ol style="list-style-type: none"> <li>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.</li> <li>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).</li> <li>3. Pharmacogenetics. Mechanisms of drug action. Receptors and their types. Liquid medicines for injections and infusions.</li> <li>4. Adverse reactions and drug toxicity. Disinfectants and disinfectants. Soft drugs (masculine, creams, pastes, liniments).</li> <li>5. Dermatologicals. Sera. Immunoglobulin. Vaccines. Other forms of drugs (sprays, inhalers, emulsions, patches).</li> </ol>

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 autoids. Drugs used to treat migraines. Antihistamines. Drugs acting on the serotonergic 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

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)

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

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	<b>3</b>

**6. TRAINING PRACTICES IN THE SUBJECT / MODUL**

Number of hours	
Rules and forms of apprenticeship	

**6. LITERATURE****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. Buczek W., Farmakologia ogólna i kliniczna, Tom I i II, 2012
3. Mutschler E., Geisslinger G., Kroemer H.K, Ruth P., pod red. Buczek 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. Buczek W., Farmakologia Goodmana & Gilmana. Tom I i II, 2007
7. Petruszewicz J., Gągała 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., Buczek W., Kompendium farmakologii i farmakoterapii. Podręcznik dla studentów medycyny, 2008

Acceptance Unit Manager or authorized person