





Educational objectives (max. 6 items)

C1. to familiarize students with the principles of rational pharmacotherapy, presenting the benefits and risks associated with drug use

C2. to teach students how to verify the sources of information about drugs and the evaluation (based on scientific evidences) of medical publications and advertisements about drugs

C3. to teach students general concepts and issues of pharmacodynamics, pharmacokinetics and pharmacoconomics

C4. to teach students the principles of drugs action and dosage, routes of administration, their mechanisms of action, pharmacological and clinical effects, basic pharmacokinetic properties, the indications, contraindications, adverse effects and main interactions

C5. to teach students determining the dosage of medicines in children and adults in various clinical conditions

C6. to teach students the general rules of order writing and practical drug prescribing and orders for nurses

Education result matrix for module/course in relation to verification methods of the intended education result and the type of class

Number of course education result	Number of major education result	Student who completes the module/course knows/is able to	Methods of verification of intended education results (forming and summarizing)	Form of didactic class <i>**enter the abbreviation</i>
K01, K02, K03	<b>C.W.34,</b>	characterizes separate groups of therapeutic agents;	written or oral exam, test, oral answer, oral presentation, practical training in multiple choice tests	L+MC
	<b>C.W.35,</b>	knows the main mechanisms of drugs' action and their changes in the system depending on age;		
	<b>C.W.36,</b>	determines the influence of disease on the metabolism and elimination of drugs;		
	<b>C.W.37,</b>	knows the basic rules of pharmacotherapy;		
	<b>C.W.38,</b>	knows important adverse effects of drugs, including those resulting from their interaction;		
	<b>C.W.39,</b>	understands the problem of drug resistance, including multidrug drug resistance;		
	<b>C.W.40,</b>	knows the indications for genetic tests carried out to individualize pharmacotherapy;		
	<b>C.W.41,</b>	knows the basic directions of therapy development, in particular the possibilities of cell therapy and gene therapy and targeted therapy in specific diseases;		



	<b>C.W.42,</b>	knows the basic concepts in the field of general toxicology;		
	<b>C.W.43,</b>	knows groups of drugs which use can lead to poisoning;		
	<b>C.W.44,</b>	knows the symptoms of the most common acute poisoning, including alcohol, drugs and other psychoactive substances, heavy metals and selected drug groups;		
	<b>C.W.45</b>	knows the basic principles of diagnostic procedures in poisoning;		
<b>S01, S02</b>	<b>C.U.13,</b>	performs simple pharmacokinetic calculations;	The student calculates without help basic pharmacokinetic parameters, prescribes correctly drugs and orders for drugs based on provided sources of information considering patient's age and state what is verified during classes (own work at the board) and in individual written form during classes and during the practical part of the exam	MC
	<b>C.U.14,</b>	orders drugs at appropriate doses to correct pathological phenomena in the body and in particular organs;		
	<b>C.U.15,</b>	designs a scheme of rational chemotherapy, empirical and targeted;		
	<b>C.U.16,</b>	correctly prescribes all forms of prescription of medicinal substances;		
	<b>C.U.17,</b>	uses pharmaceutical guides and databases on medicinal products;		
	<b>C.U.18,</b>	estimates toxicological hazard in specific age groups and in liver and kidney failure, and knows how to prevent drug poisoning;		
	<b>C.U.19</b>	interprets the results of toxicological tests		

\*\* L - lecture; SE - seminar; AC – auditorium classes; MC – major classes (non-clinical); CC – clinical classes; LC – laboratory classes; SCM – specialist classes (magister studies); CSC – classes in simulated conditions; FLC – foreign language course; PCP practical classes with patient; PE – physical education (obligatory); VP – vocational practice; SS – self-study, EL – E-learning.

Please mark on scale 1-5 how the above effects place your classes in the following categories:  
communication of knowledge, skills or forming attitudes:

Knowledge: +++

Skills: ++



<b>Student's amount of work (balance of ECTS points)</b>	
<b>Student's workload</b> (class participation, activity, preparation, etc.)	<b>Student Workload (h)</b>
1. Contact hours:	<b>150</b>
2. Student's own work (self-study):	<b>135</b>
Total student's workload	<b>285</b>
<b>ECTS points for module/course</b>	<b>9,5</b>
Comments	
<b>Content of classes</b> (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)	
<p><b>Lecture – winter semester (15 x 90 minutes) – 30 lecture hours</b></p> <ol style="list-style-type: none"> <li>1. General pharmacology - introduction</li> <li>2. General pharmacology - LADME</li> <li>3. General pharmacology – LADME – cont., pharmacokinetics</li> <li>4. General pharmacology - variation in drugs' action. Adverse and toxic reactions</li> <li>5. Autonomic nervous system – physiology, drugs acting on ganglia, endogenous catecholamines</li> <li>6. Autonomic nervous system – synthetic adrenomimetics, adrenolytics</li> <li>7. Autonomic nervous system – cholinergic system</li> <li>8. Hormones of hypothalamus, pituitary gland. Hormones of thyroid gland and antithyroid drugs.</li> <li>9. Insulin and other hypoglycemic drugs</li> <li>10. Hormones of adrenal gland (glucocorticoids, mineralocorticoids, adrenocortical antagonists)</li> <li>11. Bone homeostasis.</li> <li>12. Sex hormones.</li> <li>13. Iron and hematopoiesis</li> <li>14. Respiratory tract</li> <li>15. Gastrointestinal tract</li> </ol> <p><b>Lectures – summer semester (14 x 97 minutes) – 30 lecture hours</b></p> <ol style="list-style-type: none"> <li>1. Diuretics</li> <li>2. Lipid-lowering drugs</li> <li>3. Heparins, oral anticoagulants. Antiplatelet drugs. Thrombolytic agents.</li> <li>4. Therapy of chronic heart failure (RAA system - ACEI, ARB, RI, cardiac glycosides and other inotropic agents)</li> <li>5. Therapy of ischemic heart disease (BB, CCB, vasodilators)</li> <li>6. Therapy of arterial hypertension. Pulmonary hypertension.</li> <li>7. Antiarrhythmic drugs.</li> <li>8. Eicosanoids. NSAIDS. Non-opioid analgesics. Therapy of gout and rheumatoid arthritis.</li> <li>9. Opioid analgesics and antagonists.</li> <li>10. Autacoids – histamine, serotonin and ergot alkaloids.</li> <li>11. Vitamins, mineral substances.</li> <li>12. Toxicology. Therapeutic and toxic potential of OTC drugs. Herbal preparations and dietary supplements.</li> <li>13. Selected aspects of drug-induced toxicity.</li> <li>14. Selected aspects in pharmacology – review lecture.</li> </ol> <p>During the academic year, the order of the topics implemented may change.</p> <p><b>Classes – winter semester (15 x 135 minutes) – 45 lecture hours</b></p> <ol style="list-style-type: none"> <li>1. Regulations of the classes and lectures in Pharmacology and Toxicology. General rules of order writing. Drug development and regulation.</li> <li>2. Introduction to chemotherapy - clinical use of antimicrobial agents (Chapter 51). Management of anaphylactic shock. Dosage forms of drugs. Drug calculations.</li> <li>3. Cell wall synthesis inhibitors and daptomycin. Dosage forms of drugs. Drug calculations.</li> </ol>	



4. Protein synthesis inhibitors. Dosage forms of drugs. Drug calculations.
5. Quinolones, sulphonamides, co-trimoxazole. Other antimicrobial drugs. Antimycobacterial drugs. Dosage forms of drugs. Drug calculations.
6. Antifungal drugs. Dosage forms of drugs. Drug calculations.
7. Antiviral drugs. Dosage forms of drugs. Drug calculations.
8. Practical training in multiple choice tests – part 1. Dosage forms of drugs. Drug calculations.
9. Antiprotozoal drugs. Anthelmintic drugs. Dosage forms of drugs. Drug calculations.
10. Anticancer chemotherapy. Dosage forms of drugs. Drug calculations.
11. Immunomodulators. Biological treatment and gene therapy. Dosage forms of drugs. Drug calculations.
12. Review class of theory. Dosage forms of drugs. Drug calculations
13. Practical training in multiple choice tests – part 2. Dosage forms of drugs. Drug calculations – review.
14. Practical training in drug calculations and prescription writing – part 1. Antiseptics.
15. Summary and discussion about the drugs discussed in the semester. Possibility for retakes of tests.

**Classes – summer semester (15 x 135 minutes) – 45 lecture hours**

1. General anesthetics. Dosage forms of drugs. Drug calculations.
2. Local anesthetics. Dosage forms of drugs (local anesthetics). Drug calculations.
3. Spasmolytics, myorelaxants, drugs affecting neuromuscular transmission. Dosage forms of drugs. Drug calculations.
4. The alcohols and drugs abuse. Dosage forms of drugs. Drug calculations.
5. Antipsychotic drugs and lithium. Dosage forms of drugs. Drug calculations.
6. Mood disorders, antidepressants. Drug calculations.
7. Review class. Dosage forms of drugs. Drug calculations.
8. Practical training in multiple choice tests – part 3. Dosage forms of drugs. Drug calculations.
9. Hypnotic-sedative and anxiolytic drugs. Dosage forms of drugs. Drug calculations.
10. Neurodegenerative disorders. Dosage forms of drugs. Drug calculations.
11. Antiepileptic drugs. Dosage forms of drugs. Drug calculations.
12. Review class. Dosage forms of drugs. Drug calculations.
13. Practical training in multiple choice tests – part 4. Dosage forms of drugs. Drug calculations – review.
14. Practical training in drug calculations and prescription writing – part 2. Review of basic pharmacokinetic calculations.
15. Summary and discussion about the drugs discussed in the semester. Possibility for retakes of tests.

During the academic year, the order of the topics implemented may change.

**Basic literature** (list according to importance, no more than 3 items)

1. Basic & Clinical Pharmacology, Katzung BG, Mc Graw Hill, 14<sup>th</sup> Ed
2. Katzung & Trevor's Pharmacology Examination and Board Review, 12<sup>th</sup> Ed

**Additional literature and other materials** (no more than 3 items)

3. Brenner GM: Pharmacology Saunders/Elsevier, 5<sup>th</sup> Ed,
4. Rang and Dale's Pharmacology. HP Rang, MM Dale, JM Ritter, RJ Flower, Churchill Livingstone Elsevier, 8<sup>th</sup> Ed
5. Howland RD, Mycek MJ, Harvey RA, Champe PC: Lippincott's illustrated reviews: pharmacology, Lippincott Williams and Wilkins, 6<sup>th</sup> Ed

**Didactic resources requirements:** multimedia projector, interactive board

**Preliminary conditions** (minimum requirements to be met by the student before starting the module/course) – basic knowledge of selected aspects in anatomy, physiology, pathophysiology, microbiology and biochemistry



**Conditions to receive credit for the course** (specify the form, criteria and conditions of receiving credit for classes included in the module/course, admission terms to final theoretical or practical examination, its form and requirements to be met by the student to pass it and criteria for specific grades).

Conditions for completing the individual classes:

Presence on didactic classes is obligatory.

Conditions for completing each semester:

Besides required presence on all didactic classes student is obliged to gain in each semester 2 positive marks from multiple choice test, 1 positive mark from practical drug calculations and 1 positive mark from oral answer.

All absences on planned didactic classes during the course, including Dean's hours or Rector's days, must be made up in a form set by the academic teacher.

After fulfilling the criterion of attendance at all obligatory didactic classes and after obtaining positive grades from the theoretical and drug calculation tests as well as one positive mark from oral answer in each semester, the semester average is calculated from all marks obtained in each semester (theoretical tests, drug calculation tests, oral answers). It provides the basis for issuing a semester credit mark.

If the student did not get at least a positive grade for each of the required parts (theoretical or drug calculation tests, oral answer) despite the average above 2,0 the student does not get a semester credit.

Grade:	Criteria for course
Very Good (5.0)	4,75 - 5,0
Good Plus (4.5)	4,25 - 4,74
Good (4.0)	3,75 - 4,24
Satisfactory Plus (3.5)	3,25 - 3,74
Satisfactory (3.0)	over 2,0 - 3,24 and it is necessary to obtain at least 2 positive marks from multiple choice test, 1 positive mark from practical drug calculations 1 positive mark from oral answer in each semester

**To take the final exam:**

Completing of classes at the date specified by the Rector in the ordinance regarding the organization of the academic year 2019/2020.

**Final theoretical exam:**

Final exam is in a form of test – 100 questions in the first term and during the first retake. To pass the test 61% of correct answers are required. The level may be only decreased in some situations. Theoretical exam may be in written (open questions) or oral form (to pass the oral exam correct answers on all of 3 chosen questions are required) in case of a smaller number of students during e.g. first or second retake or commission exam.

**Final practical exam (drug calculation and order writing):**

Final practical exam is written before theoretical test and is required to take theoretical part of the exam. To pass drug calculation test correct calculations and writing of the 3 examples of prescriptions or orders for the nurse are required.

Grade:	Criteria for exam (if applicable)
Very Good (5.0)	from 93% points
Good Plus (4.5)	from 85% points
Good (4.0)	from 77% points
Satisfactory Plus (3.5)	from 69% points
Satisfactory (3.0)	from 61% points



<b>Name of unit teaching course:</b>	<b>Department of Pharmacology</b>
<b>Address</b>	Jana Mikulicza-Radeckiego 2, 50-345 Wrocław
<b>Phone</b>	+48 71 784 14 38
<b>E-mail</b>	ewa.kozlowska@umed.wroc.pl

<b>Person responsible for course:</b>	<b>Anna Merwid-Ląd, MD, PhD</b>
<b>Phone</b>	<b>71-784-1442</b>
<b>E-mail</b>	<b>anna.merwid-lad@umed.wroc.pl</b>

<i>List of persons conducting specific classes:</i>	<i>degree/scientific or professional title</i>	<i>Discipline</i>	<i>Performer profession</i>	<i>Form of classes</i>
<b>Anna Merwid-Ląd</b>	MD, PhD	medical science	academic tutor	lectures, classes
<b>Beata Nowak</b>	MD, PhD	medical science	academic tutor	classes
<b>Tomasz Sozański</b>	MD, PhD	medical science	academic tutor	classes
<b>Monika Skrzypiec-Spring</b>	MD, PhD	medical science	academic tutor	classes
<b>Dorota Książczyńska</b>	MD, PhD	medical science	academic tutor	classes

**Date of Syllabus development**

15.07.2019

**Syllabus developed by**

Anna Merwid-Ląd

Beata Nowak

**Signature of Head of teaching unit**

Uniwersytet Medyczny we Wrocławiu  
KATEDRA I ZAKŁAD FARMAKOLOGII

prof. dr hab. Adam Szatag

**Signature of Faculty Dean**

Wrocław Medical University  
FACULTY OF MEDICINE  
VICE-DEAN FOR STUDENT ENGLISH

Prof. Andrzej Hendrich, PhD

