





TOTAL per year: 90 hours													
Direct (contact) education				22,5									
online learning (synchronous)	25	20		22,5									
Online learning (asynchronous)													
<b>Educational objectives</b> (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													
<b>Education result matrix for module/course in relation to verification methods of the intended education result and the type of class</b>													
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>					
C.W	C.W9.	knows and understands the phenomenon of drug resistance;			written or oral exam, test, oral answer, oral presentation, practical training in multiple choice tests			L, SE, MC					
	C.W12.	knows the notions of: homeostasis, adaptation, resistance, immunity, propensity, susceptibility, compensation mechanisms, feedback and "vicious circle" mechanism											
	C.W18.	knows and understands the mechanisms of action of drugs as well as pharmacokinetics and biotransformation of individual groups of drugs;											
	C.W19.	knows the indications and contraindications for drugs, their dosage, adverse and toxic effects and drug-drug interactions;											
	C.W20.	knows and understands the principles of antiviral, antibacterial, antifungal and antiparasitic therapy											
	C.W21.	knows and understands the principles of preventing and combating pain and anxiety and pharmacology of drugs used in life-threatening situations;											



	<b>C.W22.</b>	knows and correctly prescribes all forms of prescription of medicinal substances;		
F.W	<b>F.W13.</b>	knows and understands the basics of antibiotic therapy and antibiotic resistance;		
	<b>F.W16.</b>	knows the principles of anesthesia in dental procedures and basic pharmacological agents		
C.U	<b>C.U8.</b>	calculates corrects doses and prescribes drugs according to indications;	test, oral answer, oral presentation, practical training in multiple choice tests and drug calculations, exam in drug calculations	SE, MC

\*\* 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: ++

**Student's amount of work (balance of ECTS points)**

Student's workload (class participation, activity, preparation, etc.)	Student Workload (h)
1. Contact hours:	22,5
2. Online learning hours (e-learning):	67,5
3. Student's own work (self-study):	180
Total student's workload	270
<b>ECTS points for module/course</b>	6
Comments	

**Content of classes** (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)

**Lectures – 25 lecture hours**

**Winter semester (6 x 113 minutes, 6 x 2,5 hours) – 15 lecture hours**

1. General pharmacology – introduction, mechanisms of drugs action.
2. General pharmacology – LADME. Dosage forms of drugs.
3. General pharmacology – pharmacokinetics, adverse effects and toxicity, variation of drugs action.
4. Autonomic nervous system – introduction. Neuromuscular pharmacology. Neuromuscular blocking drugs. Myorelaxants. Spasmolytics.
5. Adrenergic system (adrenoceptor agonists and antagonists).
6. Cholinergic system (acetylcholine receptor agonists and antagonists).

**Summer semester (4 x 113 minutes, 4 x 2,5 hours) – 10 lecture hours**

1. Diuretics. Electrolyte disturbances. Drugs for heart failure (CHF) – part 1.
2. Drugs for heart failure – part 2. Drugs for hyperlipidemia. Drugs for coronary artery disease.



3. Antihypertensive drugs. Antiarrhythmics.
4. Anticoagulant, antiplatelet and fibrinolytic drugs.

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

#### **Seminars – 20 lecture hours**

##### **Winter semester (4 x 113 minutes, 4 x 2,5 hours) – 10 lecture hours**

1. Hypothalamic and pituitary drugs. Thyroid drugs. Dosage forms of drugs. Drug calculations.
2. Adrenal steroids and related drugs. Drugs affecting fertility and reproduction. Dosage forms of drugs. Drug calculations.
3. Drugs for diabetes mellitus. Dosage forms of drugs. Drug calculations.
4. Drugs affecting calcium and bone. Vitamin D and other vitamins. Dosage forms of drugs. Drug calculations.

##### **Summer semester (4 x 113 minutes, 4 x 2,5 hours) – 10 lecture hours**

1. Sedative-hypnotic and anxiolytic drugs. Dosage forms of drugs. Drug calculations.
2. Antiepileptic drugs. Neurodegenerative disorders. Dosage forms of drugs. Drug calculations.
3. Psychoterapeutic drugs (antipsychotic drugs and antidepressants). Dosage forms of drugs. Drug calculations.
4. Summary of topics from seminars and lectures as a review for the exam.

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

#### **Practical classes – 45 lecture hours**

##### **Winter semester (10 x 90 minutes) – 20 lecture hours**

1. Regulation of classes. General rules of order writing.
2. NSAIDs, rheumatoid arthritis, gout. Paracetamol. Dosage forms of drugs. Drug calculations.
3. Opioid analgesics. Analgesic ladder. Dosage forms of drugs. Drug calculations.
4. Local and general anesthetics. Dosage forms of drugs. Drug calculations.
5. Hematopoiesis (iron, vitamin B12, folic acid). Dosage forms of drugs. Drug calculations.
6. Drugs for gastrointestinal tract disorders. Dosage forms of drugs. Drug calculations.
7. Drugs for respiratory tract disorders. Dosage forms of drugs. Drug calculations.
8. Practical training in multiple choice tests part 1. Autacoids. Treatment of allergy and headache disorders.
9. Practical training in drug calculation part 1. Management of anaphylactic shock.
10. Summary and discussion about the drugs discussed in the semester. Possibility or retakes of tests.

##### **Summer semester (10 x 113 minutes, 10 x 2,5 hours) – 25 lecture hours**

1. Basis of rational antimicrobial chemotherapy and reasons for antimicrobial therapy failure. Dosage forms of drugs. Drug calculations.
2. Inhibitors of bacterial cell wall synthesis. Dosage forms of drugs. Drug calculations.
3. Inhibitors of bacterial protein synthesis. Dosage forms of drugs. Drug calculations.
4. Quinolones, antifolate drugs and other antimicrobial agents. Dosage forms of drugs. Drug calculations.
5. Tuberculostatics. Antiparasitic drugs (protozoa, helminths).
6. Antiviral drugs. Dosage forms of drugs. Drug calculations.
7. Antifungal drugs. Dosage forms of drugs. Drug calculations.
8. Practical training in multiple choice tests part 2. Antineoplastic and immunomodulating agents.
9. Practical training in drug calculation part 2. Summary and discussion about dosage forms of drugs, routes of administration, review of basic pharmacokinetic calculations.
10. 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. Brenner GM: Pharmacology Saunders/Elsevier, 5<sup>th</sup> Ed,



<b>Additional literature and other materials</b> (no more than 3 items)	
<ol style="list-style-type: none"> <li>1. Rang and Dale's Pharmacology. HP Rang, MM Dale, JM Ritter, RJ Flower, Churchill Livingstone Elsevier, 8<sup>th</sup> Ed</li> <li>2. Howland RD, Mycek MJ, Harvey RA, Champe PC: Lippincott's illustrated reviews: pharmacology, Lippincott Williams and Wilkins, 6<sup>th</sup> Ed</li> </ol>	
<b>Didactic resources requirements</b> (e.g. laboratory, multimedia projector, other...) multimedia projector, interactive board, e-learning platforms (e.g. Testportal, BBB, Edmodo)	
<b>Preliminary conditions</b> (minimum requirements to be met by the student before starting the module/course) – basic knowledge of anatomy, physiology and microbiology	
<p><b>Conditions for completing the individual classes:</b> Presence on didactic classes (contact and distant) is obligatory and making the practical and theoretical assignments from the current lecture/seminar/class topics and/or previous topics. <b>Conditions for completing each semester:</b></p> <p>Besides required presence on all didactic classes, student is obliged to gain in each semester 1 positive mark from multiple choice test (25-50), 1 positive mark from practical drug calculations (3-6 cases) and one 1 positive mark from oral answer.</p> <p>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.</p> <p><b>To take the final exam:</b></p> <p>Completing of classes at the date specified by the Rector in the ordinance regarding the organization of the academic year 2020/2021.</p> <p><b>Final practical exam (drug calculation and order writing):</b></p> <p>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 order for the nurse are required</p> <p><b>Final theoretical exam:</b></p> <p>Final exam is in a form of multiple choice test – 50-100 questions in the first and second term. 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 the first or second retake or commission exam.</p>	
<b>Grade:</b>	<b>Criteria for passing the course with a grade</b>
Very Good (5.0)	n/a
Good Plus (4.5)	n/a
Good (4.0)	n/a
Satisfactory Plus (3.5)	n/a
Satisfactory (3.0)	n/a
	<b>Criteria for passing the course for credit (no grade)</b>
<b>Credit:</b>	Besides required presence on all didactic classes (contact and distant) student is obliged to gain in each semester 1 positive mark from multiple choice test (30-50 questions), 1 positive mark from practical drug calculations (3-6 cases) and one 1 positive mark from oral answer. All absences on planned didactic classes during the course (contact and distant), including Dean's hours or Rector's days, must be made up in a form set by the academic teacher.
	<b>Criteria</b> (examination evaluation criteria)
Very Good (5.0)	at least 93% of correct answers
Good Plus (4.5)	at least 85% of correct answers
Good (4.0)	at least 77% of correct answers



Satisfactory Plus (3.5)	at least 69% of correct answers
Satisfactory (3.0)	at least 61% of correct answers

<b>Unit realizing the subject</b>	<b>Department of Pharmacology</b>
Unit address	Jana Mikulicza-Radeckiego 2, 50-345 Wrocław
Telephone	+48 71 784 14 38
E-Mail	ewa.kozlowska@umed.wroc.pl

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

<b>List of persons conducting specific classes</b>				
<b>Full name</b>	<b>degree/scientific or professional title</b>	<b>Discipline</b>	<b>Performer profession</b>	<b>Form of classes</b>
<b>Anna Merwid-Ląd</b>	MD, PhD	medical science	academic tutor	lectures, seminars
<b>Beata Nowak</b>	MD, PhD, DSc,	medical science	academic tutor	classes
<b>Tomasz Sozański</b>	MD, PhD, DSc, WMU prof.	medical science	academic tutor	classes

**Date of Syllabus development**

25.09.2020

**Syllabus developed by**

Anna Merwid-Lad, MD, PhD

Beata Nowak, MD, PhD, DSc

**Signature of Head of teaching unit**

.....

**Signature of Faculty Dean**

.....