



USOS Code: 48SJO-PAT

ECTS: 11.00

Cycle: 2026

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

Faculty of Medicine

Course syllabus – part A

Pharmacology and Toxicology

Pharmacology and Toxicology

Legal acts specifying learning outcomes:
467/2024;

Discipline: Medical Sciences

Course status: Obligatory

Group of courses: B - major course

ISCED Code: 0912

Field of studies: Medicine

Field: Medicine

Learning profile: -

Form of studies: full-time

Level of studies: uniform master's studies

Year/Semester: 3rd year, Medicine in English

Classes types: Lecture; Seminar; Classes;

Classes: Lecture (30h); Seminar (60h); Classes (60h);

Language: ANG

Introductory subject: Biochemistry, physiology, patophysiology,

Prerequisites: Understanding the basic physiological processes taking place in the body at the cellular, systemic and the whole organism level. Understanding the pathomechanism of diseases

Organized by the unit:

Coordinators responsible for the course:

Michał Majewski, michal.majewski@uwm.edu.pl

Piotr Jakubowski, piotr.jakubowski@uwm.edu.pl

Additional notes:

SUBJECT MATTER CONTENT:

Seminar – Fundamentals of pharmacology. Definitions of drugs and poisons. Small molecules and biological drugs. Drug manufacturing and clinical trials. Branches of pharmacology. Generic and trade names. Pharmacodynamics. Drugs affecting the autonomic nervous system. Antibiotics part 1- concepts, mechanisms, resistance, beta-lactams. Antiviral and antifungal drugs - classification, indications, adverse effects Introduction to CNS pharmacology - neurotransmitters, BBB, psychotropics, sedatives & hypnotics Anticonvulsants; treatment of Parkinson's disease; drugs for dementia syndromes Pain treatment - opioids, antagonists, migraine therapy Endocrine drugs - Part II: thyroid medications, pancreatic hormones, GLP-1, antidiabetic drugs, gonadal hormones. Drugs for gastrointestinal disorders: PPIs, H2 antagonists, antiemetics, laxatives, antidiarrheals, IBD medications. Pediatric and geriatric pharmacology; dermatological drugs. Immunopharmacology: immunosuppressive drugs, immunomodulation, biopharmaceuticals, gene therapy, monoclonal antibodies. Drugs for heart failure, arrhythmia management, and acute myocardial infarction. Drug interactions, adverse effects, "lifestyle" drugs, supplements, OTC products, herbal medicines, doping agents.

Classes – Pharmacokinetics — routes of administration, absorption, distribution, metabolism and excretion; pharmacokinetic parameters; therapy monitoring Prescribing drugs — rules and practice Antibiotics - characteristics of specific groups Antiparasitic and antiprotozoal drugs; disinfectants, antiseptics, sterilants Antipsychotics and antidepressants General and local anesthetics; skeletal muscle relaxants; spasmolytics Eicosanoids: prostaglandins, leukotriens, thromboxane. Non steroidal antiinflammatory drugs, acetaminophen, metamizole Endocrine drugs — Part I: hypothalamic and pituitary hormones; adrenocortical hormones; mineralocorticoids, calcium and bone metabolism Treatment of autoimmune and inflammatory diseases; treatment of gout Pharmacotherapy of respiratory diseases: β -agonists, anticholinergics, inhaled corticosteroids, leukotriene modifiers, PDE-4 inhibitors; treatment of cystic fibrosis; ophthalmic drugs. Cancer chemotherapy: alkylating agents, antimetabolites, antitumor antibiotics, plant alkaloids, targeted therapies (antibodies, kinase inhibitors, CAR-T, and others). Introduction to cardiovascular pharmacology: antihypertensive drugs, diuretics, vasoactive peptides. Vasodilators, treatment of coronary artery disease, nitric oxide, treatment of dyslipidemia.

Lecture – Pharmacogenomics and personalized medicine New drug development and clinical trials Endocannabinoid system and cannabinoid pharmacology Pharmacology of the reproductive system Addiction, tolerance, and drug dependence Pharmacology of purines and novel therapeutic targets Individualization of pharmacotherapy and therapeutic drug monitoring Fundamentals of toxicology and mechanisms of action of toxic substances Organ toxicity of drugs and xenobiotics Environmental and occupational toxicology

TEACHING OBJECTIVE:

The student learns about individual groups of medicinal products, their Mechanisms and effects of action, basic indications and contraindications and basic pharmacokinetic and pharmacodynamic parameters; Preparation for practical application.

DESCRIPTION OF THE LEARNING OUTCOMES OF THE COURSE IN RELATION TO THE DESCRIPTION OF THE CHARACTERISTICS OF THE SECOND LEVEL LEARNING OUTCOMES FOR QUALIFICATIONS AT LEVELS 6-8 OF THE POLISH QUALIFICATION FRAMEWORK IN RELATION TO THE SCIENTIFIC DISCIPLINES AND THE EFFECTS FOR FIELDS OF STUDY

Symbols for outcomes related to the discipline:

M/NMA_P7S_KO+++++, M/NMA_P7S_KR++, M/NMA_P7S_UW+++++, M/NMA_P7S_WG+++++

Symbols for outcomes related to the field of study:

K.1.+, K.2.+, K.3.+, K.4.+, K.5.+, K.6.+, K.7.+, K.8.+, K.9.+, K.10.+, K.11.+, KA7_KO1+, KA7_KR1+, KA7_KR2+, C.U8.+, C.U9.+, C.U10.+, C.U11.+, C.U12.+, C.U13.+, C.W35.+, C.W36.+, C.W38.+, C.W28.+, C.W29.+, C.W30.+, C.W31.+, C.W32.+, C.W33.+, C.W34.+, C.W37.+

LEARNING OUTCOMES:

Knowledge (W1) – The student is able to discuss the mechanisms of action of drugs, adverse effects, toxic, as well as possible interactions that may appear during polytherapy. Has knowledge of the indications, contraindications and dosage of drugs. He knows the rules for the use of antimicrobials, the principles of treatment for poisoning. Has knowledge of the pharmacology of developmental and geriatric age

Skills (U1) – The student demonstrates the ability to use drugs in the treatment of specific diseases. May prescribe medications. Knowing the main groups of drugs that interact, patients, e.g. the elderly and children, can use the drug in a given group.

Social competences (K1) – The student can establish and maintain a deep and respectful contact with the patient. He/she is guided by the good of the patient, placing them in the first place. Respects medical confidentiality and patient's rights. He/she is aware of his own limitations and the ability to constantly improve his skills.

Symbols for outcomes related to the field of study:

Seminar – ['W1', 'U1', 'K1'] – • student multimedia presentations, • academic teacher's presentation, • diagrams of drug mechanisms of action, • worksheet, • board or flipchart, • computers with access to online databases of medicinal product information, Summaries of Product Characteristics (SmPCs), and current drug information sources.

Classes – ['W1', 'U1', 'K1'] – • clinical case analysis, • guided discussion, • small-group work, • solving practical tasks, • exercises in prescription writing and the selection of therapeutic management.

Lecture – ['W1', 'U1', 'K1'] – Multimedia presentation

**FORM AND CONDITIONS OF VERIFYING LEARNING
OUTCOMES:**

Lecture (Oral exam) – [] – 60 %

Seminar (Written exam) – ['W1', 'U1', 'K1'] – 60 %

Classes (Oral exam) – ['W1', 'U1', 'K1'] – 60 %

REQUIRED LITERATURE:

1. Basic and Clinical Pharmacology 16e

Todd W. Vanderah; McGraw Hill; 2024; Pages: 1368;
Tome: 1;

2. Rang & Dale's Pharmacology

James M. Ritter, Yoon Kong Loke, Rod J. Flower, Graeme
Henderson, David MacEwan Emma Robinson, James
Fullerton; Elsevier; 2023; Pages: 872; Tome: 1;

COMPLIMENTARY LITERATURE:

**1. Goodman and Gilman's The Pharmacological Basis of
Therapeutics, 14th Edition**

Laurence Brunton Bjorn Knollman; McGraw Hill /
Medical; 2022; Pages: 1664; Tome: 1;



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Detailed description of ECTS credits awarded - part B

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Pharmacology and Toxicology

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1. Contact hours with the academic teacher:

- participation in: Lecture	30 h
- participation in: Seminar	60 h
- participation in: Classes	60 h
- consultation	4 h
Total:	154 h

Independent work of a student:

- Studying for exam	61.00 h
- Studying for classes and seminars	60.00 h
Total:	121.00 h

contact hours + independent work of a student Total: 275.00 h

1 ECTS credit = 25-30 h of an average student's work, number of ECTS

ECTS Points = 275.00 h : 25 h/ECTS = 11.00 ECTS

Average: 11.00 ECTS

- including the number of ECTS credits for contact hours with the direct participation of an academic teacher - 6.16 ECTS pts

- including the number of ECTS credits for hours of independent work of a student - 4.84 ECTS pts