

Zajęcia lub grupy zajęć, niezależnie od formy ich prowadzenia, wraz z przypisaniem do nich efektów uczenia się i treści programowych zapewniających uzyskanie tych efektów

Kierunek – Master of Pharmacy

Poziom studiów – jednolite studia magisterskie

Profil – ogólnoakademicki

Forma studiów – stacjonarne

Efekty uczenia się zatwierdzone Uchwałą nr 46/2026 Senatu GUMed z dnia 30 marca 2026 r.

Lp.	Zajęcia/grupa zajęć	Efekty uczenia się	Podstawowe treści programowe
1.	Anatomy	A.W4, A.U3, A.U4	The structure and topography of organs of the human body in the context of their role and belonging to functional systems: skeletal and muscular, circulatory, nervous, respiratory, digestive and urogenital.
2.	Biology and genetics	A.W9, A.U1, A.W1, A.W2, A.W8, A.W3, A.U2	The subject focuses on animal and plant cell biology and the basics of genetics. Students trace the organization of cells, the interactions of cellular structures, and their function in cells. The basics of parasitology are also presented.
3.	General and inorganic chemistry	B.W5, B.W6, B.W7, B.W8, B.W9, B.W10, B.U4, B.U5	Structure of matter, elementary particles, chemical laws, properties of elements and chemicals. Basic laboratory techniques, calculations and qualitative analysis.
4.	History of pharmacy	E.W27, A.U20	History of the pharmacy from the antiquity to the present; history of the pharmacist profession, history of the selected drug discoveries.
5.	Information literacy	F.U3	Presentation of the Library regulations and the rules of using Library resources and services, mostly the ways of searching for and ordering literature needed during the studies.
6.	Information technology	B.U12, E.U15	Using the e-learning platform. Word text editor – formatting and editing the document, inserting tables, graphics, formulas. Excel – calculations, charts. Multimedia presentations in Power Point.

7.	Mathematics	B.W24	The student know basic elementary functions, the concept of inverse, complex, diverse, monotonic, even, and odd functions as well as one-to-one function. Elements of differential and integral calculus.
8.	Safety and Good Work Practice	A.W27, B.W2, D.W23, A.U18	Lectures during safety training, students learn about the risk factors in the environment (biological, chemical, physical) accidents and potentially by accident situations, the issues of fire protection and first aid techniques.
9.	Basic Polish I	E.U32, F.U3	Greeting, introducing, numbers, personal information, nationalities, professions, family members, verbs (hobbies, routines - present forms), food and drinks, transport, days of the week, colours, adjectives (shape, size, quality), time expressions.
10.	Biophysics	B.W1, B.W2, B.W3, B.W4, B.U1, B.U2, B.U3	Biophysics elements important for pharmacy like measurement of potentials and biomedical signals; density, viscosity and surface tension measurements, refractometry and polarimetric analysis.
11.	Botany	A.W24, A.W26, A.U16, A.U17, C.U29, C.U30, A.W25	The plant histology, morphology and organography – structure and function of root, stem, leaf, rhizome, flower, and fruit. Systematics of vascular medicinal plants.
12.	History of philosophy	A.W28, E.W23, E.W28, A.U20, E.U31	Development of philosophical problems, methods of practicing philosophy, philosophical views, trends (currents), schools, systems and philosophical faculties over the centuries.
13.	Hygiene and Epidemiology	E.U20, E.U29, F.U3, E.W24, E.W25, E.W26	The aim of this course is to familiarize students with the significance and methodology of epidemiological research in the prevention and control of diseases at the population level. The course also covers the fundamentals of pharmacoepidemiology.
14.	Latin language classes	C.U4	Lexical aspects of botany, pharmacology and chemistry. Terminology used in prescriptions, abbreviations. Elements of anatomy and clinical terminology. Latin and Greek prefixes and suffixes.
15.	Physical chemistry	B.W15, B.W16, B.U1, B.U8, B.U9	Thermodynamics; phase systems; surface phenomena and dispersion

			systems; electrochemistry; kinetics and pharmacokinetics; quantum mechanics; methods in structural chemistry.
16.	Physical education	A.W4, E.W30	Exercises to strengthen the postural muscles, exercise of varying intensity including strength training, endurance, high-speed, and reducing body fat. Strengthening exercises and stretching various muscle groups.
17.	Propaedeutics of Pharmaceutical Practice	C.U34	Presentation of pharmacy as a interdisciplinary field of science. Practical use of knowledge obtained during particular courses will be emphasized.
18.	Statistics	B.W25, B.W26, B.U11, B.U12	Student acquires skills needed to describe real-life natural processes in mathematical and statistical terms; use statistical methods and models in medical sciences.
19.	Microbiology	A.W18, A.W19, A.W20, A.W21, A.W22, A.W23, A.W24, A.U11, A.U12, A.U13, A.U14, A.U15	Identification, cultivation of microorganisms, ultrastructure, environmental requirements, life functions, threats and the role in the functioning of the higher organisms, microbiological safety.
20.	Molecular biology	A.W15, A.W16, A.W32, A.U10, A.W10, A.W14, A.W17, A.U1	The purpose of the course is to provide students with basic knowledge of the molecular basis of life, mechanisms of storage and flow of genetic information and to introduce students to the basic techniques of molecular biology.
21.	Physiology	A.W5, B.W1, B.W2, A.U4	The objective of the course is to make students aware of physiological mechanisms securing normal function of the human organism, especially regulation processes and the involved structures and chemical agents.
22.	Analytical chemistry	B.W11, B.W13, B.W14, B.U6, B.U7, B.U11, B.W7, B.W12, B.W23, B.W8	Characteristics of chemical and instrumental methods of analysis. Stages of analytical procedure. Calibration and validation of analytical methods. Calculations in chemical analysis.
23.	Basic Polish II	E.U32, F.U3	Upgrading communicative skills, vocabulary and grammar to interact effectively in everyday situations (with cultural background). Verbs – present and past forms. Basic medical and pharmaceutical terms (anatomy, hospital setting, medications).

24.	Biochemistry	A.W8, A.W11, A.U6, A.U7, A.U8, A.W9, A.W10, D.U19	Proteins, enzymes, bioenergetics and oxidative phosphorylation, metabolism of carbohydrates, lipids and nitrogen compounds, cholesterol metabolism, detoxification, cell signaling.
25.	Immunology	A.W12, A.W13, C.W21, A.U9, A.U13	Course content will allow students to understand: the body's defenses mechanisms, interaction with the external environment, functional disorders and applications in diagnostics and therapy.
26.	Intellectual property protection	C.W14	Intellectual Property Rights and their protection. Copyrights, Author's Moral Rights, patents, methods of transferring patents, licenses. Combating unfair competition.
27.	Organic chemistry	B.W6, B.W8, B.W17, B.W18, B.W19, B.W20, B.W21, B.W23, B.U10, B.W22	Student gets acquainted with the main concepts and rules of organic chemistry, organic compounds classification, structure and its correlation with physical and chemical properties, methods of synthesis and analysis.
28.	Psychology and sociology	A.W29, A.W30, A.W31, A.U19, A.U21	The classes will discuss the main psychological trends and the most important sociological concepts in relation to selected health and illness problems.
29.	Pathophysiology with elements of oncology	A.W2, A.W5, A.W6, A.W7, A.W11, A.W12, A.W14, F.W1, A.U4, A.U5, E.U16, E.U26, F.U3	Pathophysiology is the study of the causes, mechanisms, and course of diseases with the aim of improving pharmaceutical care and understanding the mechanisms of drug action.
30.	Basics of drug design	B.W27, C.W3, C.W13, B.U12	The aim of the course is to provide knowledge on the basics of drug design based on molecular modeling methods.
31.	Medical ethics	E.W14, E.W23, E.W28, E.W29, A.U20, E.U19, E.U22, E.U30, E.U31, A.W28	Discussing issues in the field of medical ethics and law in the profession of pharmacist and selected bioethical issues related to the progress in medicine.
32.	One-month summer training at community pharmacy	1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 1.3.7, 1.3.8, 1.3.9, 1.3.10, A.W20, B.W7, C.W5, C.W26, C.W27, C.W30, C.W31, C.W32, E.W1,	Provides students interns with an overview of the community pharmacy policy, with focus on organization structure, current standards (with emphasis on pharmaceutical compounding), administration procedures, equipment and local requirements.

		E.W3, E.W6, E.W7, E.W11, E.W14, E.W15, E.W17, E.W29, C.U4, C.U14, C.U15, C.U16, C.U17, C.U20, C.U23, C.U34, D.U35, E.U2, E.U4, E.U8, E.U12, E.U25, E.U26, E.U30, E.U31	
33.	Pharmaceutical biotechnology	C.W17, C.W18, C.U12, C.U13, C.U34, C.W16, C.W20, C.W22, C.W23, C.W24	The aim of the course is to provide knowledge on the use of microorganisms, tissue cultures, methods of genetic engineering, biotransformation processes for the production of drug substances. Legal aspect of biopharmaceuticals.
34.	Pharmaceutical chemistry	C.W1, C.W2, C.W3, C.W9, C.U1, C.U3, C.U13, C.W6, C.W8, C.U6, C.U7, C.W7, D.W12, E.U16	Therapeutic substances in the ATC system. Structure-activity of drugs (SAR). Analytical quality control of drugs according to the Polish and European Pharmacopoeia. Physicochemical and metabolic stability of drugs.
35.	Pharmaceutical technology I	A.W20, B.W22, C.W5, C.W6, C.W15, C.W25, C.W26, C.W27, C.W28, C.W29, C.W30, C.W31, C.W32, C.W33, C.W34, C.W35, C.W41, D.W7, D.W16, E.W11, A.U11, C.U3, C.U4, C.U5, C.U7, C.U8, C.U14, C.U15, C.U16, C.U17, C.U18, C.U19, C.U20, C.U23, C.U24, C.U25, C.U26, C.U28, E.U25, F.U3, D.W1, D.W3	The aim of the course is to prepare for the manufacturing/compounding, dispensing and quality control of medicinal products, in particular liquid and semi-solid forms and pharmacy compounded drugs.
36.	Pharmacognosy	C.W5, C.W41, C.W42, C.W43, C.W44, C.W45, D.W40, C.U18,	The student is familiarized with origin, occurrence, conditions of harvesting, drying, storage, chemical composition, activity and application of mainly plant

		C.U29, C.U30, C.U31, C.U32, C.U33, C.U34, D.U32, D.W39, C.W19	raw materials as well as methods of their standardization and evaluation of their quality.
37.	Pharmacy pre-training	E.W4, E.W29, C.U14, E.U2, E.U22, E.U30, E.U31	The aim of the course is to present the basic principles of working in a pharmacy in order to prepare students to undergo an internship in a community pharmacy.
38.	Qualified first aid	A.W27, A.U18	To introduce students to the organization of the emergency medical system in Poland, the principles of resuscitation and first aid.
39.	Bromatology	D.W30, D.W31, D.W33, D.W34, D.W35, D.W36, D.U23, D.U24, D.U25, D.U26, D.U28, D.U30, D.U31, D.W32, D.U27, D.U29	The aim of bromatology: the role of food for the human body, food and dietary supplements quality and safety and methods of their evaluation, basics of rational nutrition and medical dietetics, drug interactions with food and alcohol.
40.	Introduction to medicine	A.W27, C.W4, E.W13, A.W7, A.W19, C.W21, D.W17, E.W15	The analysis of symptoms reported by the patient regarding the most common diseases. The knowledge is to help in understanding the pathophysiology of diseases and the basics of their diagnosis and treatment.
41.	Nature Drugs	D.W38, D.W39, D.W40, D.W41, D.W42, D.W43, D.W44, C.U33, D.U11, D.U33, D.U34, D.U35	The aim of the course is to present products containing herbal substances and herbal preparations used for therapeutic purposes and in the prevention of diseases.
42.	Pharmaceutical technology II	C.W5, C.W15, C.W20, C.W25, C.W26, C.W28, C.W29, C.W30, C.W31, C.W32, C.W33, C.W34, C.W35, C.W36, C.W37, A.U11, C.U4, C.U5, C.U8, C.U14, C.U15, C.U19, C.U20, C.U23, C.U24, C.U25, C.U26, C.U27, C.U28, C.U34, E.U4, C.W22, C.U21	The aim of the course is to prepare for the production, dispensing and quality assessment of solid drug forms (tablets, granules, capsules) and parenteral drugs – on an industrial and compendial scale.

43.	Basics of entrepreneurship	E.W20, E.W29, A.U19, E.U3	The aim of the course is to master the basic skills in the following areas: assessment of the company's competitive situation, setting goals, developing a strategy for their achievement and the ability to control their implementation.
44.	Clinical Pharmacy	E.W12, E.W14, D.U17, E.U9, E.U14, E.U23, E.W10, D.U12, E.U7, E.U10, E.U16, E.U17, E.U18, E.U24, C.W4, D.W8, E.W9, C.U2	Diagnostics of selected diseases in the field of endocrinology, hematology, cancer and health emergencies. Clinical case analysis. Monitoring nephro- and hepatotoxicity of xenobiotics. Clinical studies. Obesity – prevention and treatment.
45.	One-month summer training at hospital pharmacy	1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 1.3.7, 1.3.8, 1.3.9, 1.3.10, C.U1, C.U14, C.U16, C.U17, C.U20, C.U21, C.U22, C.U23, C.U34, D.U17, E.U1, E.U2, E.U4, E.U15	The aim of the practice is to familiarize a student with the role and tasks of pharmacists working in hospital pharmacies and other institutions (pharmaceutical manufactures and plants, analytical departments or drug agencies).
46.	Pharmaceutical law	E.W1, E.W2, E.W3, E.W4, E.W5, E.W6, E.W22, E.W23, D.U5, E.U19, E.U21	Clinical trials rules; marketing authorization; wholesale and retail sale of drugs. Pharmacy Inspection and other agencies. Legal rules in pharmacy practice. Pharmacy self government.
47.	Pharmacoeconomics	E.W19, E.W20, E.W21, C.U34, E.U27, E.U28	Basic elements and concepts of pharmacoeconomics, including health care economics and health care resources management.
48.	Pharmacokinetics	D.W5, D.U3, D.W4, D.W6, D.W8, D.W22, D.U10	Presentation of pharmacokinetics as a branch of pharmacology that allows to understand the processes of the drug in the body and to learn about the factors that may modify them. Acquainting with the methods of calculation the basic parameters
49.	Pharmacology and pharmacodynamics	C.W19, D.W7, D.W12, D.W13, D.W15, D.W16, D.W17, D.W18, D.W19, E.W15, C.U34, D.U11, D.U13, D.U14,	The course will cover the topics from pharmacology and pharmacodynamic domains which are presented in details in the program's description.

		D.U15, D.U29, D.W14, D.W20	
50.	Synthesis and technology of pharmaceutical substances	C.W10, C.U9, C.U11, C.U34, B.W27, C.U10, C.W11, C.W12, C.W14, C.W24, C.W47	The aim of the subject is to gain basic knowledge of the search and synthesis of drugs, design and implementation of chemical unit processes, and good manufacturing practice.
51.	Toxicology	D.W26, D.W29, E.W16, D.U18, D.U19, D.U20, D.U22, D.U21, D.W21, D.W22, D.W23, D.W24, D.W25, D.W27, D.W28	Knowledge of the basics of toxicology, including: mechanisms of toxicity, factors influencing toxicity, methods of testing toxicity, basics of environmental toxicology. The role of toxicology in ensuring the safety of pharmacotherapy.
52.	Biopharmaceutics	D.W1, D.W2, D.W3, D.W9, D.W10, D.W11, D.U1, D.U2, D.U4, D.U5, D.U6, D.U7, D.U8, D.U9	Physicochemical properties of the active substance and absorption; LADME; route of drug administration; patient's characteristics and drug reaction; influence of food, alcohol and environmental factors on drug action.
53.	Clinical Pharmacy	D.W37, E.W12, E.W14, D.U17, E.U9, E.U11, E.U14, E.U23, C.W4, D.W8, E.W9, E.W10, C.U2, D.U12, E.U7, E.U10, E.U16, E.U17, E.U18, E.U24	Clinically important parameters describing PK/PD of drugs. Physiological and genetic determinants affecting drug dosing. Evidence based medicine. Population analysis. Diagnostics and treatment of selected civilization diseases.
54.	Pharmaceutical care	E.U5, E.U6, E.U9, E.U11, E.U12, E.U14, E.U16, F.U3, E.W8, E.W9, E.W15, E.W16, C.U34, D.U15, D.U16, D.U17, E.U7, E.U8	Main tasks of the community pharmacy, daily tasks and responsibilities of a pharmacist. Advanced services in a community pharmacy. Interpersonal communication: medical professionals/patients.
55.	Pharmaceutical technology III	A.W20, B.W22, C.W5, C.W6, C.W9, C.W11, C.W15, C.W20, C.W25, C.W26, C.W27, C.W28, C.W29, C.W30, C.W31, C.W32, C.W33, C.W34, C.W35, C.W36,	The aim of the course is to prepare for the production and quality assessment of various pharmaceutical preparations – on an industrial and compendial scale, especially in a hospital pharmacy.

		D.W7, A.U11, C.U4, C.U5, C.U7, C.U8, C.U14, C.U15, C.U16, C.U17, C.U18, C.U19, C.U20, C.U21, C.U22, C.U23, C.U24, C.U25, C.U26, C.U27, C.U28, C.U34, D.U9, F.U3, C.W38, C.W39, C.W40, C.W46	
56.	Pharmacotherapy and drug information	D.W7, D.W18, D.W19, E.W10, E.W11, E.W12, E.W13, E.W26, D.U10, E.U16, E.U17, E.U25	Pharmacotherapy of most prevalent diseases, internet drug databases, drug safety, adverse drug reactions.
57.	Pharmacy practice	A.W30, A.W31, C.W32, D.W16, E.W1, E.W3, E.W15, E.W26, A.U19, A.U21, C.U8, C.U15, D.U16, E.U6, E.U8, E.U12, E.U13, E.U14, E.W7, E.W14, E.W17, E.W18, E.W30, C.U34, D.U17, E.U1, E.U3, E.U11, E.U23, E.U25, F.U3, E.W2, E.U2, E.U26, E.U15	Main tasks of the community pharmacy, daily tasks and responsibility of a pharmacist. Advanced services in a community pharmacy. Interpersonal communication: medical professionals/patients.
58.	Scientific research methodology	F.W1, F.U1, F.U2, F.U3, F.U4, F.U5	The student becomes familiar with research methods and techniques used in scientific research and acquires the skills of planning, conducting, documenting, interpreting and presenting the results of scientific research.
59.	Six-month training at pharmacy	1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 1.3.7, 1.3.8, 1.3.9, 1.3.10, C.U14, C.U16, C.U17, C.U19, C.U20, C.U21, C.U22,	The aim of the internship is to deepen theoretical knowledge and improve practical skills in the field of pharmacy acquired during pharmacy studies.

		C.U23, C.U34, D.U15, D.U16, D.U17, D.U30, D.U31, D.U35, E.U1, E.U2, E.U4, E.U5, E.U6, E.U7, E.U8, E.U9, E.U11, E.U12, E.U13, E.U14, E.U15, E.U17, E.U18, E.U19, E.U22, E.U25, E.U26, E.U28, E.U30, E.U31	
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