

Efekty uczenia się

Kierunek – Master of Pharmacy

Poziom studiów – jednolite studia magisterskie

Profil – ogólnoakademicki

Forma studiów – stacjonarne

Efekty uczenia się obowiązują od cyklu kształcenia 2026-2032

Szczegółowy numer efektu uczenia się ¹	Efekty uczenia się² po ukończeniu studiów absolwent:	PRK ³	PRK ⁴
OGÓLNE EFEKTY UCZENIA SIĘ – KOMPETENCJE SPOŁECZNE (jest gotów do)			
1.3.1	to establish relationships with patients and colleagues based on mutual trust and respect	P7U_K	P7S_KR
1.3.2	to notice and recognize his/her own limitations, make self-assessment of deficits and educational needs	P7U_K	P7S_KK
1.3.3	to implement the principles of professional camaraderie and cooperation in a team of specialists, including representatives of other medical professions, also in a multicultural and multinational environment	P7U_K	P7S_KR
1.3.4	to respect the confidentiality of health status, patient rights and professional ethics	P7U_K	P7S_KR
1.3.5	to present an ethical and moral attitude in accordance with ethical principles and to take actions based on the code of ethics in professional practice; promoting health-promoting behaviors	P7U_K	P7S_KR
1.3.6	to promote health-promoting behaviors	P7U_K	P7S_KR
1.3.7	to use objective sources of information	P7U_K	P7S_KR

¹ Objaśnienie oznaczeń:

Dla kierunków: lekarskiego, lekarsko- dentystycznego, farmaceutycznego, położnictwa, pielęgniarstwa, fizjoterapii, ratownictwa medycznego numery są określone w standardach kształcenia dla danego kierunku.

Dla pozostałych przyjmuje się poniższe oznaczenia:

K (przed podkreślnikiem) — szczegółowe efekty uczenia się

W — kategoria wiedzy; U — kategoria umiejętności; K (po podkreślniku) — kategoria kompetencji społecznych
01, 02, 03 i kolejne — numer efektu uczenia się

² Liczba dowolna (należy dodać lub usunąć wiersze tabeli w razie potrzeby).

³ Wpisać symbol z Polskich Ram Kwalifikacji - Charakterystyki I stopnia (uniwersalne)

⁴ Wpisać symbol z Polskich Ram Kwalifikacji - Charakterystyki II stopnia Polskiej Ramy Kwalifikacji dla kwalifikacji uzyskiwanych w ramach szkolnictwa wyższego

1.3.8	to draw conclusions based on his/her own measurements or observations	P7U_K	P7S_KR
1.3.9	to formulate opinions on various aspects of professional activity	P7U_K	P7S_KO
1.3.10	to accept responsibility for decisions made in the course of professional activity, including those related to his/her own safety and the safety of others	P7U_K	P7S_KO
BIOMEDYCZNE I HUMANISTYCZNE PODSTAWY FARMACJI – WIEDZA (zna i rozumie)			
A.W1	organisation of the living matter and cytophysiology of the cell	P7U_W	P7S_WG
A.W2	the rudiments of classical, population, and molecular genetics and the genetic aspects of cellular differentiation	P7U_W	P7S_WG
A.W3	monogenic and polygenic heredity of human features and the genetic polymorphism of the human population	P7U_W	P7S_WG
A.W4	the anatomy of the human organism and the basic interdependencies between organism anatomy and function in health and illness	P7U_W	P7S_WG
A.W5	the functioning mechanisms of the human organism on the molecular, cellular, tissue, and systemic levels	P7U_W	P7S_WG
A.W6	the rudiments of the pathophysiology of the cell and the systems of the human organism	P7U_W	P7S_WG
A.W7	disturbances of the adaptive and regulatory functions of the human organism	P7U_W	P7S_WG
A.W8	the structure, properties, and biological functions of amino-acids, proteins, nucleotides, nucleic acids, hydrocarbons, lipids, and vitamins	P7U_W	P7S_WG
A.W9	the structure and functions of the biological membranes and the mechanisms of transport across the membranes	P7U_W	P7S_WG
A.W10	the molecular aspects of signal transduction	P7U_W	P7S_WG
A.W11	the main metabolic pathways and their interdependencies, the metabolism regulation mechanisms, and the impact of medicinal drugs on the processes	P7U_W	P7S_WG
A.W12	the functioning of the immune system of the organism and the mechanisms of immune responses	P7U_W	P7S_WG

A.W13	the principles of immunological diagnostics and the immunoprophylaxis and immunotherapy methods	P7U_W	P7S_WG
A.W14	the molecular background of the cell cycle regulation, proliferation, apoptosis, and neoplastic transformation	P7U_W	P7S_WG
A.W15	the issues of DNA recombination and cloning	P7U_W	P7S_WG
A.W16	the functions and methods studying the human genome and transcriptome	P7U_W	P7S_WG
A.W17	the mechanisms regulating gene expression and the role of epigenetics in the process	P7U_W	P7S_WG
A.W18	the characteristic of bacteria, viruses, fungi, and parasites, and the principles of microbiological diagnostics	P7U_W	P7S_WG
A.W19	the basics of etiopathology of infectious diseases	P7U_W	P7S_WG
A.W20	the rules of disinfection and antiseptics, and the impact of antimicrobial agents on microorganisms and the human health	P7U_W	P7S_WG
A.W21	the problems of hospital-acquired infections and the hazards of alert pathogens	P7U_W	P7S_WG
A.W22	the pharmacopoeial requirements and methods of testing microbiological purity and aridity of pharmaceuticals	P7U_W	P7S_WG
A.W23	the microbiological methods of testing the mutagenic impact of pharmaceuticals	P7U_W	P7S_WG
A.W24	the morphological and anatomical characteristics of prokaryotic organisms, fungi, and plants the medicinal raw materials and materials used in pharmacy are obtained from	P7U_W	P7S_WG
A.W25	the research methods used in taxonomy of species and the search for new species and varieties of medicinal plants and fungi	P7U_W	P7S_WG
A.W26	the principles of keeping the herbarium and its importance and usefulness in pharmaceutical sciences	P7U_W	P7S_WG
A.W27	the methods of assessing the basic vital functions of a human in life-threatening condition and the principles of coming to qualified first aid	P7U_W	P7S_WG

A.W28	the basic philosophical issues (metaphysics, epistemology, axiology, and ethics)	P7U_W	P7S_WG
A.W29	the psychological tools and the principles of interpersonal communication with patient, their carers, physicians, and other staff of the health care system	P7U_W	P7S_WG
A.W30	the social conditions and limitations ensuing from human illness and disability	P7U_W	P7S_WG
A.W31	the psychological and social aspects of aid attitudes and actions	P7U_W	P7S_WG
A.W32	the techniques of molecular biology in pharmaceutical biotechnology and gene therapy	P7U_W	P7S_WG
FIZYKOCHEMICZNE PODSTAWY FARMACJI – WIEDZA (zna i rozumie)			
B.W1	the physical background of physiological processes (circulation, nerve conduction, gas exchange, motion, substance exchange)	P7U_W	P7S_WG
B.W2	the impact of physical and chemical factors in the environment on the human organism	P7U_W	P7S_WG
B.W3	the methodology of measuring biophysical quantities	P7U_W	P7S_WG
B.W4	the biophysical background of diagnostic and therapeutic techniques	P7U_W	P7S_WG
B.W5	the structure of an atom and particle, the periodic table of elements and their properties, including radioactive isotopes in terms of their application in diagnostics and therapy	P7U_W	P7S_WG
B.W6	the mechanisms of formation and the types of chemical bonding and the mechanisms of intermolecular interactions	P7U_W	P7S_WG
B.W7	the types and properties of solutions and the methods of producing them	P7U_W	P7S_WG
B.W8	the basic types of chemical reactions	P7U_W	P7S_WG
B.W9	the characteristics of metals and non-metals, and the nomenclature and properties of inorganic compounds used in diagnosing and treating illnesses	P7U_W	P7S_WG
B.W10	the methods of identifying inorganic substances, including the pharmacopoeial methods	P7U_W	P7S_WG
B.W11	the classic methods of quantitative analysis	P7U_W	P7S_WG

B.W12	the theoretical and methodological basis of spectroscopic, electrochemical, chromatographic, and mass spectrometry techniques, and the operating principles of the devices used in the techniques	P7U_W	P7S_WG
B.W13	the criteria of selecting the analytical method	P7U_W	P7S_WG
B.W14	the principles of validating the analytical method	P7U_W	P7S_WG
B.W15	the basics of chemical thermodynamics and kinetics, and the quantum background of the structure of matter	P7U_W	P7S_WG
B.W16	the physical chemistry of multiphase systems and surface phenomena, and the mechanisms of catalysis	P7U_W	P7S_WG
B.W17	the division of carbon compounds, and the nomenclature of organic compounds	P7U_W	P7S_WG
B.W18	the structure of organic compounds as presented in the theory of atomic and molecular orbitals, and the resonance and induction effects	P7U_W	P7S_WG
B.W19	the types and mechanisms of chemical reactions of organic compounds (substitution, addition, elimination)	P7U_W	P7S_WG
B.W20	the systematics of organic compounds by functional groups and their properties	P7U_W	P7S_WG
B.W21	the structure and properties of heterocyclic compounds and selected natural compounds: hydrocarbons, steroids, terpenes, lipids, peptides, and proteins	P7U_W	P7S_WG
B.W22	the structure, properties, and methods of obtaining polymers used in pharmaceutical technology	P7U_W	P7S_WG
B.W23	the preparation and spectroscopic and chromatographic methods of analysing organic compounds	P7U_W	P7S_WG
B.W24	the elementary functions, the basics of the differential and integral calculus	P7U_W	P7S_WG
B.W25	the elements of the calculus of probability and mathematical statistics (events and probability, random variables, the distribution function of the random variable, the average value and the variance), the basic distributions of random	P7U_W	P7S_WG

	variables, point and interval estimates of parameters		
B.W26	the methods of testing statistical hypotheses, and the significance of correlation and regression	P7U_W	P7S_WG
B.W27	the theoretical methods used in pharmacy, and the basics of bioinformation technology and molecular modelling in designing	P7U_W	P7S_WG
ANALIZA, SYNTEZA I TECHNOLOGIA LEKÓW – WIEDZA (zna i rozumie)			
C.W1	the division of medicinal substances according to the anatomical, therapeutic, chemical classification (ATC)	P7U_W	P7S_WG
C.W2	the chemical structure of basic medicinal substances	P7U_W	P7S_WG
C.W3	the interdependencies between the chemical structure, physical and chemical properties, and action mechanisms of medicinal substances	P7U_W	P7S_WG
C.W4	the elements and the isotope-labelled compounds used in diagnostics and treatment of disease	P7U_W	P7S_WG
C.W5	the structure of the pharmacopoeia and its significance in the quality of the medicinal substances and products	P7U_W	P7S_WG
C.W6	the methods used in assessing the quality of substances for pharmaceutical purposes, and in analysis of medicinal products, as well as the ways of validating the methods	P7U_W	P7S_WG
C.W7	the quality control methods for isotope-labelled medicines	P7U_W	P7S_WG
C.W8	the durability of the basic medicinal substances and potential reactions of their decomposition, plus factors affecting their durability	P7U_W	P7S_WG
C.W9	the issues of counterfeit medications	P7U_W	P7S_WG
C.W10	the methods of producing exemplary medicinal substances, the physical operations employed, and the unitary chemical processes	P7U_W	P7S_WG
C.W11	the requirements of describing the production process and assessing the quality of a medicinal substance in the registration	P7U_W	P7S_WG

C.W12	the methods of obtaining and separating optically active medicinal substances, and the methods of obtaining various polymorphic forms	P7U_W	P7S_WG
C.W13	the methods of searching for new medicinal substances	P7U_W	P7S_WG
C.W14	the issues of patent protection of substances used for pharmaceutical purposes and medicinal products	P7U_W	P7S_WG
C.W15	the physical, chemical, and functional properties of basic excipients used in the medicine form technology	P7U_W	P7S_WG
C.W16	the productive potential of live cells and organisms, and the possibility of regulating it under biotechnological methods	P7U_W	P7S_WG
C.W17	the conditions of live cell and organism cultures, and the processes employed in pharmaceutical biotechnology, including purification of the obtained medicinal substances	P7U_W	P7S_WG
C.W18	the methods and techniques of changing the scale and optimising process parameters in pharmaceutical biotechnology	P7U_W	P7S_WG
C.W19	the basic groups, biological properties, and applications of biological medicinal substances	P7U_W	P7S_WG
C.W20	the forms of biopharmaceuticals and the problems of their durability	P7U_W	P7S_WG
C.W21	the basic vaccines, the principles of their application and storage	P7U_W	P7S_WG
C.W22	the basic blood products and blood substitutes and the ways of obtaining them	P7U_W	P7S_WG
C.W23	the pharmacopoeial requirements biological medicines should satisfy, and the principles of introducing them to trading	P7U_W	P7S_WG
C.W24	the new achievements in research of biological and synthetic medicines	P7U_W	P7S_WG
C.W25	the nomenclature, composition, structure, and properties of individual medicine forms	P7U_W	P7S_WG
C.W26	The requirements formulated with respect to various forms of medicines, and the principles of selecting the medicine form depending on the properties of the medicinal substance and the designation of the medicinal product	P7U_W	P7S_WG

C.W27	the rules governing the production and control of prescription medicinal drugs and their storing conditions	P7U_W	P7S_WG
C.W28	the kinds of physical and chemical incompatibilities between components of pharmaceutical preparations	P7U_W	P7S_WG
C.W29	the basic technological processes and devices used in the technology of the medicinal drug form	P7U_W	P7S_WG
C.W30	the methods of producing liquid, semi-solid, and solid forms of a medicinal drug in the laboratory and industrial scales, and the impact of the parameters of the technological process on the properties of the form of the medicinal drug	P7U_W	P7S_WG
C.W31	the aseptic procedures and the methods of obtaining aridity of medicinal products, substances, and materials	P7U_W	P7S_WG
C.W32	the types of packaging and dosing systems	P7U_W	P7S_WG
C.W33	the principles of Good Manufacturing Practices as specified in the secondary legislation promulgated based on the Pharmaceutical Law Act of 6 September 2001, section 39(5)(1) (Journal of Laws 2020: it. 944, as amended), including the principles of documenting technological processes	P7U_W	P7S_WG
C.W34	the methods of testing the quality of the form of medicinal drugs, and the method of analysing a production series	P7U_W	P7S_WG
C.W35	the factors affecting durability of the forms of medicinal drugs, and the methods of testing their durability	P7U_W	P7S_WG
C.W36	the scope of chemical and pharmaceutical tests required for the registration documentation of a medicinal product	P7U_W	P7S_WG
C.W37	the extent of employing risk analysis, designing the quality and technology based on an analysis of the process in pharmaceutical production	P7U_W	P7S_WG
C.W38	the principles of producing homeopathic preparations	P7U_W	P7S_WG
C.W39	the methods of producing ex tempore radiopharmaceutical products	P7U_W	P7S_WG

C.W40	the options of employing nanotechnology in pharmacy	P7U_W	P7S_WG
C.W41	the types of herbal preparations, their production methods and quality assessment methods	P7U_W	P7S_WG
C.W42	the herbal raw materials used in therapeutics and in production of medicinal drugs, dietary supplements, and cosmetics	P7U_W	P7S_WG
C.W43	the groups of chemical compounds which determine the therapeutic properties of herbal substances and preparations	P7U_W	P7S_WG
C.W44	the chemical structures of compounds found in medicinal herbs, their action and application	P7U_W	P7S_WG
C.W45	the methods of testing herbal substances and preparations, and the methods of isolating components from the herbal material	P7U_W	P7S_WG
C.W46	nanoparticles and their application in diagnostics and therapies	P7U_W	P7S_WG
C.W47	biomedical polymer and macromolecular conjugates of medicinal substances, and their application in medicine and pharmacy	P7U_W	P7S_WG
BIOFARMACJA I SKUTKI DZIAŁANIA LEKÓW – WIEDZA (zna i rozumie)			
D.W1	the processes the drug undergoes in the organism depending on the route and way of administration	P7U_W	P7S_WG
D.W2	the structure and function of biological barriers in the organism, which affect drug absorption and distribution	P7U_W	P7S_WG
D.W3	the impact of drug form and administration method on its absorption and the duration of its effect	P7U_W	P7S_WG
D.W4	the pharmacokinetic processes (LADME) and their significance in development research on drugs and optimization of pharmacotherapy	P7U_W	P7S_WG
D.W5	the parameters describing the pharmacokinetic processes and the ways of their determination	P7U_W	P7S_WG
D.W6	the physiological, pathophysiological and environmental conditions affecting the course of pharmacokinetic processes	P7U_W	P7S_WG

D.W7	the drug interactions on the pharmacokinetic, pharmacodynamics, and pharmaceutical phases	P7U_W	P7S_WG
D.W8	the rudiments of therapeutic active substance monitoring and the principles of changing the drug dosage in the patient	P7U_W	P7S_WG
D.W9	the methods of assessing pharmaceutical and biological availability, and the issues connected with correlation of the in vitro – in vivo test results (IVIVC)	P7U_W	P7S_WG
D.W10	the significance of the factors pertaining to improved pharmaceutical and biological availability of a medicinal product	P7U_W	P7S_WG
D.W11	the issues connected with biopharmaceutical assessment of the original and generic drugs, including the methods of assessing bioequivalence	P7U_W	P7S_WG
D.W12	the targets and action mechanisms of medicinal drugs and of attaining structural biology in this respect	P7U_W	P7S_WG
D.W13	the pharmacological properties of individual drug groups	P7U_W	P7S_WG
D.W14	the factors affecting the action of drugs in the pharmacodynamics phase, including hereditary factors and the assumptions of personalised therapy	P7U_W	P7S_WG
D.W15	the basics of the molecular targeted therapy strategies, and the mechanisms of drug resistance	P7U_W	P7S_WG
D.W16	the routes of drug administration and the ways of dosing them	P7U_W	P7S_WG
D.W17	the indications, contraindications, and specific undesirable effects of a drug, as well as effects depending on the dose	P7U_W	P7S_WG
D.W18	the classification of undesirable effects	P7U_W	P7S_WG
D.W19	the rules of correct drug combinations and the types of drug interactions, the factors pertaining to their occurrence and the possibilities of avoiding them	P7U_W	P7S_WG
D.W20	the basic concepts of pharmacogenetics and pharmacogenomics as well as new achievements in the field of pharmacology	P7U_W	P7S_WG

D.W21	the basic notions of toxicokinetics, toxicometry, and toxicogenetics	P7U_W	P7S_WG
D.W22	the processes a xenobiotic undergoes in the organism, especially the biotransformation processes depending on the route of administration or exposure	P7U_W	P7S_WG
D.W23	the issues related to the types of exposure to poisons (acute toxicity, chronic toxicity, long term effects)	P7U_W	P7S_WG
D.W24	the endogenic and exogenic factors modifying the activity of the enzymes metabolising xenobiotics	P7U_W	P7S_WG
D.W25	the toxicity of selected medicinal drugs, addictive substances, psychoactive substances, and other chemical substances, and the procedures to be followed in intoxication	P7U_W	P7S_WG
D.W26	the principles and methods of conducting air and biological monitoring in the assessment of exposure to selected xenobiotics	P7U_W	P7S_WG
D.W27	the in vitro and in vivo methods used in testing toxicity of xenobiotics	P7U_W	P7S_WG
D.W28	the rules of planning and the methodology of toxicological tests required in the process of searching for and registering new medicinal drugs	P7U_W	P7S_WG
D.W29	the health risks and consequences related to environmental pollution	P7U_W	P7S_WG
D.W30	the basic nutrients, the organisms demand therefor, their significance, physiological availability and metabolism, and the nutrition sources	P7U_W	P7S_WG
D.W31	the methods employed to assess the nutritional value of food	P7U_W	P7S_WG
D.W32	the issues of substances added to food products, food contamination, and improper quality of the products designated to be in contact with food	P7U_W	P7S_WG
D.W33	the issue of enriched food, dietary supplements, and agents of special nutritional designation	P7U_W	P7S_WG
D.W34	the methods of assessing the diet of a healthy and ill person	P7U_W	P7S_WG
D.W35	the rudiments of the drug-food interaction	P7U_W	P7S_WG

D.W36	the requirements and methods of assessing the quality of dietary supplements, especially those containing vitamins and minerals	P7U_W	P7S_WG
D.W37	the methods of enteral nutrition of patients	P7U_W	P7S_WG
D.W38	the principles of designing complex herbal medicines	P7U_W	P7S_WG
D.W39	the criteria of assessing the quality of herbal medicinal products and dietary supplements	P7U_W	P7S_WG
D.W40	the molecular action mechanisms of herb-derived substances, their metabolism and biological availability	P7U_W	P7S_WG
D.W41	the medicinal products of herbal origin and therapeutic indications for their administration	P7U_W	P7S_WG
D.W42	the issues of the clinical tests of herbal medicinal drugs, and the position and significance of phytotherapy in the conventional medicine system	P7U_W	P7S_WG
D.W43	the procedure of standardisation of a herbal medicinal drug and its use in the registration process	P7U_W	P7S_WG
D.W44	the new achievements in the area of herbal drugs	P7U_W	P7S_WG
PRAKTYKA FARMACEUTYCZNA – WIEDZA (zna i rozumie)			
E.W1	the legal grounds and rules of organisation of the pharmaceutical market in terms of retail trade in the Republic of Poland and the operations of public and hospital apothecaries	P7U_W	P7S_WG
E.W2	the rules of organisation of the pharmaceutical market in terms of wholesale trade in the Republic of Poland and the functioning of pharmaceutical wholesalers	P7U_W	P7S_WG
E.W3	the rules of issuing, registering, and filling in prescriptions, and the principles of the apothecary's issuing medicinal drugs	P7U_W	P7S_WG
E.W4	the legal grounds and rules of practising the pharmaceutical profession, the regulations of obtaining the right to practise the pharmacist profession, and the functioning rules of the pharmacist self-governing bodies	P7U_W	P7S_WG
E.W5	the legal grounds and organisation of the medicinal product production process	P7U_W	P7S_WG

E.W6	the rules of organisation and financing of the health care system in the Republic of Poland and the role of the pharmacist in the system	P7U_W	P7S_WG
E.W7	the importance of proper drug management in the health care system	P7U_W	P7S_WG
E.W8	the idea of pharmaceutical care and the notions related to pharmaceutical care, particularly those referring to the problems and needs of using medicinal drugs	P7U_W	P7S_WG
E.W9	the principles of monitoring the effectiveness and safety of the patient's pharmacotherapy in the process of pharmaceutical care	P7U_W	P7S_WG
E.W10	the rules of individualisation of pharmacotherapy to account for the differences in drug actions caused by physiological factors in health problems and in clinical conditions	P7U_W	P7S_WG
E.W11	the basic scientific sources of information on medicinal drugs	P7U_W	P7S_WG
E.W12	the principles of evidence-based therapeutic procedures	P7U_W	P7S_WG
E.W13	the therapeutic standards and guidelines to therapeutic procedures	P7U_W	P7S_WG
E.W14	the role of the pharmacist and representatives of other medical professions on a therapeutic team	P7U_W	P7S_WG
E.W15	the risks involved in the patient's self-administration of drugs	P7U_W	P7S_WG
E.W16	the issue of addiction to medicinal drugs and other substances, and the role of the pharmacist in overcoming the addictions	P7U_W	P7S_WG
E.W17	the principles of taking the medicinal drug depending on its form, as well as on the packaging type and the dosing system	P7U_W	P7S_WG
E.W18	the rules of introducing medicinal products, dietary supplements, nutrients of special designation, and cosmetics to trading	P7U_W	P7S_WG
E.W19	the rudiments of health economics and pharmacoeconomics	P7U_W	P7S_WG
E.W20	the methods and tools of assessing the costs and effects for economic analyses	P7U_W	P7S_WG

E.W21	the guidelines to assessing medical technologies, particularly as concerns the assessment of cost effectiveness, and the methodology of assessing the effectiveness and safety of medicinal drugs	P7U_W	P7S_WG
E.W22	the legal basis and the rules of conducting and organising research of a drug, including experimental tests and human participation therein	P7U_W	P7S_WG
E.W23	the legal, ethical, and methodological aspects of clinical research, and the role of the pharmacist in it	P7U_W	P7S_WG
E.W24	the importance of the population health indices	P7U_W	P7S_WG
E.W25	the rules of conducting various research of epidemiological nature	P7U_W	P7S_WG
E.W26	the rules of monitoring safety of medicinal products after their introduction to trading	P7U_W	P7S_WG
E.W27	the history of pharmacy and the pharmacist profession, and the lines the education preparing for the practising of the pharmacist profession develops; the global pharmacist organisations and other organisations grouping pharmacists	P7U_W	P7S_WG
E.W28	the basic notions of ethics, deontology, and bioethics, and the deontological issues of the pharmacist profession	P7U_W	P7S_WG
E.W29	the ethical principles of the contemporary pharmaceutical marketing	P7U_W	P7S_WG
E.W30	the principles of health promotion, its objectives, and the role of the pharmacist in promoting healthy life style	P7U_W	P7S_WG
METODOLOGIA BADAŃ NAUKOWYCH – WIEDZA (zna i rozumie)			
F.W1	the research methods and techniques used in the research programme in progress	P7U_W	P7S_WG
BIOMEDYCZNE I HUMANISTYCZNE PODSTAWY FARMACJI – UMIEJĘTNOŚCI (potrafi)			
A.U1	use his/her knowledge of the genetic background of organism differentiation and the heredity mechanisms to characterise genetic polymorphism	P7U_U	P7S_UW
A.U2	assess the genetic conditions conducive to the development of diseases in human population	P7U_U	P7S_UW

A.U3	apply anatomic denominations to describe health condition	P7U_U	P7S_UW
A.U4	the mechanisms of the functioning of the human organism at the molecular, cellular, tissue, and system levels describe	P7U_U	P7S_UW
A.U5	describe the development mechanisms of functioning disorders and interpret the pathophysiological sources of the development of diseases	P7U_U	P7S_UW
A.U6	use his/her knowledge of biochemistry to assess physiological and pathological processes	P7U_U	P7S_UW
A.U7	detect and determine proteins, nucleic acids, hydrocarbons, lipids, hormones, and vitamins	P7U_U	P7S_UW
A.U8	perform tests of the kinetics of enzymatic reactions	P7U_U	P7S_UW
A.U9	describe and explain immunological mechanisms and processes in health and illness	P7U_U	P7S_UW
A.U10	isolate, determine, and amplify nucleic acids and analyse them	P7U_U	P7S_UW
A.U11	apply the basic work techniques related to microbes and the rules of aseptic work	P7U_U	P7S_UW
A.U12	identify microbes based on their morphological features and physiological and culture properties	P7U_U	P7S_UW
A.U13	apply immunological methods and techniques of molecular biology in microbiological diagnostics	P7U_U	P7S_UW
A.U14	test and assess the activity of antimicrobial agents	P7U_U	P7S_UW
A.U15	conduct microbiological control of pharmaceuticals under pharmacopoeial methods	P7U_U	P7S_UW
A.U16	identify and describe the structural components of plant cells, tissues, and body members using microscope and histochemical methods	P7U_U	P7S_UW
A.U17	recognise the species of medicinal plants based on their morphological and anatomical features	P7U_U	P7S_UW
A.U18	recognise situations threatening human health or life and come to qualified first aid in health or life threatening conditions	P7U_U	P7S_UW

A.U19	initiate and support group, assistance, and preventive actions, influence attitudes, and lead teams	P7U_U	P7S_UO
A.U20	assess actions and moral dilemmas based on ethical principles	P7U_U	P7S_UK
A.U21	use psychological tools in interpersonal communication with patients, their carers, physicians, and other staff of the health care system	P7U_U	P7S_UK
FIZYKOCHEMICZNE PODSTAWY FARMACJI – UMIEJĘTNOŚCI (potrafi)			
B.U1	measure and determine physical, biophysical, and physical cum chemical values using appropriate laboratory apparatuses, and perform physical and chemical calculations	P7U_U	P7S_UW
B.U2	interpret biophysical properties and phenomena, and assess the impact of physical factors in the environment on living organisms	P7U_U	P7S_UW
B.U3	analyse physical phenomena and processes used in diagnosing and treating diseases	P7U_U	P7S_UW
B.U4	identify inorganic substances, also using pharmacopoeial methods	P7U_U	P7S_UW
B.U5	perform water analysis for pharmaceutical purposes	P7U_U	P7S_UW
B.U6	validate an analytical method	P7U_U	P7S_UW
B.U7	perform qualitative and quantitative analyses of elements and chemical compounds, and assess credibility of the analysis result	P7U_U	P7S_UW
B.U8	conduct tests of the kinetics of chemical reactions	P7U_U	P7S_UW
B.U9	analyse physical and chemical properties and processes forming the basis of biological action of medicinal drugs and of pharmacokinetics	P7U_U	P7S_UW
B.U10	assess and anticipate the properties of organic compounds based on their structure, plan and perform synthesizing of organic compounds in the laboratory scale, and identify them	P7U_U	P7S_UW
B.U11	use mathematical, statistical, and IT tools to process, interpret, and present the results of experiments, analyses, and measurements	P7U_U	P7S_UW
B.U12	use IT tools to process and present data, and to arrive at creative problem solutions	P7U_U	P7S_UW

ANALIZA, SYNTEZA I TECHNOLOGIA LEKÓW – UMIEJĘTNOŚCI (potrafi)			
C.U1	divide active substances according to the anatomical, therapeutic, chemical classification (ATC), using international nomenclature and trade names	P7U_U	P7S_UW
C.U2	explain the application of radiopharmaceuticals in diagnosing and treating diseases	P7U_U	P7S_UW
C.U3	asses the properties of a substance in terms of its use in pharmacy based on its chemical structure	P7U_U	P7S_UW
C.U4	use the pharmacopoeia, the guidelines, and the literature on assessing the quality of a substance for use in pharmacy and medicinal products	P7U_U	P7S_UW
C.U5	plan quality control of a substance intended for pharmaceutical use and of a medicinal product in accordance with the pharmacopoeial requirements	P7U_U	P7S_UW
C.U6	perform identity and quality tests of a medicinal substance and analyse its content in the medicinal product under pharmacopoeial methods, including spectroscopy and chromatography	P7U_U	P7S_UW
C.U7	Interpret the results obtained in quality assessment of a substance intended for pharmaceutical use and of a medicinal product, and verify consistency of the results obtained with the specification	P7U_U	P7S_UW
C.U8	detect defects in a medicinal product based on observations, where the defects qualify for reporting to the authority relevant for supervision over the safety of use of medicinal products	P7U_U	P7S_UW
C.U9	identify the stages of and critical parameters in synthesis of a medicinal substance and produce a flow chart of an exemplary synthesis process	P7U_U	P7S_UW
C.U10	conduct synthesis of a medicinal substance and propose its purification method	P7U_U	P7S_UW
C.U11	explain the presence of the remains of solvents and impurities in a medicinal substance	P7U_U	P7S_UW
C.U12	analyse the stage and parameters of a biotechnological process	P7U_U	P7S_UW

C.U13	assess the quality and durability of a medicinal substance obtained in biotechnological processes and propose its specification	P7U_U	P7S_UW
C.U14	use the pharmacopoeia, formulary, and technological regulations, guidelines, and the literature on the medicine form technology, particularly with respect to prescription medication	P7U_U	P7S_UW
C.U15	suggest the appropriate medicine form depending on the properties of the medicinal substance and its designation	P7U_U	P7S_UW
C.U16	produce prescription medicinal drugs, select the packaging, and define the useful life of the medicine and the way it should be stored	P7U_U	P7S_UW
C.U17	recognise and solve problems stemming from the composition of the prescription drug, perform controls of the drug dosage, and verify its composition	P7U_U	P7S_UW
C.U18	produce herbal preparations in laboratory conditions and assess their quality under pharmacopoeial methods	P7U_U	P7S_UW
C.U19	assess the functional properties of excipients for pharmaceutical use	P7U_U	P7S_UW
C.U20	produce preparations in aseptic conditions and select the aridification method	P7U_U	P7S_UW
C.U21	produce mixtures for parenteral nutrition	P7U_U	P7S_UW
C.U22	produce cytostatic drugs in the form ready for administration to the patient	P7U_U	P7S_UW
C.U23	prepare operating procedures and protocols of the actions taken whilst producing a prescription and pharmacy drug	P7U_U	P7S_UW
C.U24	plan the stages of producing the medicine form in industrial conditions, select the apparatuses, and propose the interprocess control methods	P7U_U	P7S_UW
C.U25	Perform tests to assess the quality of the medicine form, operate the proper control and measurement apparatuses, and interpret the test results	P7U_U	P7S_UW
C.U26	assess the risk of poor quality of a medicinal product and medical device and its clinical consequences	P7U_U	P7S_UW

C.U27	propose specification of a medicinal product and plan durability tests of medicinal substances and products	P7U_U	P7S_UW
C.U28	identify the factors affecting durability of a medicinal product and select the proper storage conditions	P7U_U	P7S_UW
C.U29	recognise the herbal medicinal raw material and classify it in the proper botanic group based on its morphological and anatomical features	P7U_U	P7S_UW
C.U30	identify the herbal medicinal substance under macro and microscopic methods	P7U_U	P7S_UW
C.U31	assess the quality of the herbal medicinal raw material based on pharmacopoeial monographs and conduct its analysis under the pharmacopoeial test methods	P7U_U	P7S_UW
C.U32	perform an analysis of a simple and complex herbal medicine and identify the active substances contained therein under the chromatographic or spectroscopic methods	P7U_U	P7S_UW
C.U33	provide information on the chemical composition and medicinal properties of herbal substances and preparations	P7U_U	P7S_UW
C.U34	seek scientific information on medicinal substances and products	P7U_U	P7S_UW
BIOFARMACJA I SKUTKI DZIAŁANIA LEKÓW – UMIEJĘTNOŚCI (potrafi)			
D.U1	assess the differences in absorption of a medicinal substance depending on the composition of the drug, its form, and the physiological and pathological conditions	P7U_U	P7S_UW
D.U2	explain the significance of cross-membrane transport in pharmacokinetic processes (LADME)	P7U_U	P7S_UW
D.U3	calculate and interpret the pharmacokinetic parameters of a medicinal drug, determined using pharmacokinetic models or other methods	P7U_U	P7S_UW
D.U4	present the importance, propose the methodology of, and interpret the results of research on pharmaceutical and biological availability and of the bioequivalence tests	P7U_U	P7S_UW
D.U5	use the regulations of the law, guidelines, and scientific publications on the research on	P7U_U	P7S_UW

	biological availability and bioequivalence of medicinal drugs		
D.U6	present and explain the concentration profiles of an active substance in blood depending on the administration route and drug form	P7U_U	P7S_UW
D.U7	conduct a test of release from the oral forms of a drug so as to demonstrate similarity of various medicinal products, using pharmacopoeial methods and apparatuses	P7U_U	P7S_UW
D.U8	substantiate the possibility of releasing a medicinal product from bioequivalence tests in vivo based on the biopharmaceutical classification system (BCS)	P7U_U	P7S_UW
D.U9	anticipate the effects of changed pharmaceutical and biological availability of a medicinal substance as the result of modification of the drug form	P7U_U	P7S_UW
D.U10	explain the causes and effects of interactions in the pharmacokinetic phase and define the methods of preventing the interactions	P7U_U	P7S_UW
D.U11	explain the pharmacological properties of a medicinal drug based on its target and action mechanism	P7U_U	P7S_UW
D.U12	substantiate the need to change the drug dosage depending on the physiological and pathological conditions and genetic factors	P7U_U	P7S_UW
D.U13	anticipate the undesirable effects of individual groups of medicinal drugs depending on the dosage and action mechanism	P7U_U	P7S_UW
D.U14	explain the causes and effects of interactions in the pharmacodynamics phase and define the methods of preventing the interactions	P7U_U	P7S_UW
D.U15	provide information on indications and contraindications of administering medicinal drugs and on their proper dosage and taking	P7U_U	P7S_UK
D.U16	provide pharmacological information in a way comprehensible to the patient	P7U_U	P7S_UK
D.U17	cooperate with representatives other medical professions in ensuring safety and effectiveness of pharmacotherapy	P7U_U	P7S_UW
D.U18	assess the threats connected with environmental pollution with environmental	P7U_U	P7S_UW

	poisons, medicinal substances and their metabolites		
D.U19	characterise the biotransformation of xenobiotics and assess its significance in metabolic activation and detoxification	P7U_U	P7S_UW
D.U20	anticipate the target and power of the toxic actions of a xenobiotic depending on its chemical structure and type of exposure	P7U_U	P7S_UW
D.U21	perform extraction of poisons from biological material and select the proper detection method	P7U_U	P7S_UW
D.U22	conduct exposure assessment (biological monitoring) based on toxicological analysis of biological material	P7U_U	P7S_UW
D.U23	characterise food products in terms of their composition and nutritional value	P7U_U	P7S_UW
D.U24	conduct assessment of the nutritional value of food under the calculation and analytical methods (including gas and fluid chromatography, and atomic absorption spectrometry)	P7U_U	P7S_UW
D.U25	assess the diet in terms of covering the demand for energy and basic nutrients in health and illness	P7U_U	P7S_UW
D.U26	explain the principles and role of proper feeding in disease prevention and their course	P7U_U	P7S_UW
D.U27	assess the exposure of human organism on the pollutants present in food	P7U_U	P7S_UW
D.U28	anticipate the effects of changing the concentration of the active substance in blood as the result of eating specific food products	P7U_U	P7S_UW
D.U29	explain the causes and effects of interactions between individual drugs and between drugs and food	P7U_U	P7S_UW
D.U30	provide advice to patients as concerns interactions between drugs and food	P7U_U	P7S_UK
D.U31	provide information on the application of nutritional preparations and dietary supplements	P7U_U	P7S_UK
D.U32	assess the quality of products containing herbal medicinal raw materials	P7U_U	P7S_UW

D.U33	design a herbal drug of specific action	P7U_U	P7S_UW
D.U34	assess the action profile of a herbal medicinal product based on its composition	P7U_U	P7S_UW
D.U35	provide advice to patients in terms of administration, contraindications, interactions, and undesirable effects of medicinal drugs of natural origin	P7U_U	P7S_UW
PRAKTYKA FARMACEUTYCZNA – UMIEJĘTNOŚCI (potrafi)			
E.U1	lay down the rules of managing a medicinal drug at the hospital and apothecary	P7U_U	P7S_UW
E.U2	fill in prescriptions using the available IT tools, and provide information on the drug issued	P7U_U	P7S_UW
E.U3	define the duties, supervise, and organise the apothecary personnel work	P7U_U	P7S_UW
E.U4	specify the conditions of storing medicinal products, medical devices, and dietary supplements; identify the products requiring special storing conditions, and control the storage conditions	P7U_U	P7S_UW
E.U5	plan, organise, and exercise pharmaceutical care	P7U_U	P7S_UW
E.U6	hold pharmaceutical consultations in the process of pharmaceutical care and pharmaceutical advisory services	P7U_U	P7S_UK
E.U7	cooperate with the physician in optimising and rationalising therapy in in-patient out-patient care	P7U_U	P7S_UW
E.U8	select over the counter medicinal drugs in conditions not requiring medical consultation	P7U_U	P7S_UW
E.U9	produce the plan of monitoring pharmacotherapy defining the methods and principles of assessing therapy efficiency and safety	P7U_U	P7S_UW
E.U10	implement and explain individualisation of drug dosing in a patient in clinical conditions	P7U_U	P7S_UW
E.U11	select the drug form for the patient in recognition of the clinical recommendations, the patient's needs, and availability of the products	P7U_U	P7S_UW

E.U12	indicate the proper treatment of the medicinal drug whilst administered to the patient and provide information on the drug	P7U_U	P7S_UW
E.U13	indicate the proper medicinal drug handling by the personnel of the health care system	P7U_U	P7S_UW
E.U14	educate the patient on the medicinal drugs he/she takes and other problems related to his/her health condition and illness, and compile individualised educational materials for the patient	P7U_U	P7S_UK
E.U15	use the IT tools in his/her professional practice	P7U_U	P7S_UW
E.U16	anticipate the impact of various factors on the pharmacokinetic and pharmacodynamics properties of medicinal drugs, and solve problems of individualisation and optimisation of pharmacotherapy	P7U_U	P7S_UW
E.U17	monitor and report any undesirable effects of medicinal drugs, implement preventive actions, provide information related to the complications of pharmacotherapy to the personnel of the health care system, the patients, or their families	P7U_U	P7S_UW
E.U18	define the risks connected with the administered pharmacotherapy in various groups of patients and plan preventive actions	P7U_U	P7S_UW
E.U19	identify the role and tasks of individual bodies of the pharmacist self-government, and the rights and obligations of its members	P7U_U	P7S_UW
E.U20	assess and interpret the results of epidemiological research and draw conclusions therefrom; indicate the core errors scarring the research	P7U_U	P7S_UW
E.U21	name the competent pharmaceutical organisation or office dealing with the specific professional problem	P7U_U	P7S_UW
E.U22	identify the basic ethical problems inherent in the contemporary medicine, life and health protection, and research	P7U_U	P7S_UW
E.U23	participate actively in the works of a therapeutic team cooperating with the personnel of the health care system	P7U_U	P7S_UO
E.U24	participate actively in clinical research, especially in terms of supervising the quality of	P7U_U	P7S_UO

	the tested medicinal product and monitoring the clinical research; managing the economy of the medicinal products and devices intended for clinical research		
E.U25	use various sources of information on the medicinal drug and critically interpret the information	P7U_U	P7S_UW
E.U26	participate in actions promoting health and prophylactics	P7U_U	P7S_UW
E.U27	estimate the costs and effects of pharmacotherapy, calculate and interpret cost and effectiveness coefficients, indicate a more cost-effective procedure, and specify the impact of a new medical technology on the financing of the health care system	P7U_U	P7S_UW
E.U28	analyse critically the publications on the effectiveness, safety, and economic aspects of pharmacotherapy, and publications on the pharmaceutical professional practice and market	P7U_U	P7S_UW
E.U29	compare the frequency of health phenomena, and calculate and interpret the population health indices	P7U_U	P7S_UW
E.U30	follow the principles of professional deontology, including the Code of Ethics of a Pharmacist of the Republic of Poland	P7U_U	P7S_UW
E.U31	respect the patient's rights	P7U_U	P7S_UW
E.U32	communicate with the patients and personnel of the health care system in a foreign language at the B2+ level of the European Framework of Reference for Languages	P7U_U	P7S_UK
METODOLOGIA BADAŃ NAUKOWYCH – UMIEJĘTNOŚCI (potrafi)			
F.U1	plan scientific research and discuss its objective and anticipated results	P7U_U	P7S_UW
F.U2	interpret scientific research and relate it to the current state of knowledge	P7U_U	P7S_UW
F.U3	use specialist scientific literature, both domestic and foreign	P7U_U	P7S_UW
F.U4	conduct scientific research, interpret and document it results	P7U_U	P7S_UW
F.U5	present the outcomes of research	P7U_U	P7S_UW

PRAKTYCZNE NAUCZANIE KLINICZNE NA VI ROKU STUDIÓW - UMIEJĘTNOŚCI⁵ (potrafi samodzielnie)			

Dla kierunków studiów przygotowujących do wykonywania zawodów: lekarza, lekarza dentystry, farmaceuty, pielęgniarki, położnej, diagnosty laboratoryjnego, fizjoterapeuty, ratownika medycznego efekty ogólne z zakresu wiedzy i umiejętności stanowiące sumę efektów szczegółowych (z wyszczególnieniem tych efektów):

Kod efektu	Treść efektu	PRK³	PRK⁴	Powiązane efekty szczegółowe
OGÓLNE EFEKTY UCZENIA SIĘ – WIEDZA (zna i rozumie)				
1.1.1	the issues within the scientific discipline – pharmaceutical sciences – at an advanced level	P7U_W	P7S_WG	C.W3, C.W30, D.W4, D.W13, D.W38, E.W4.
1.1.2	the issues in the field of scientific disciplines - medical sciences (including the etiology of the most common diseases), biological sciences, chemical sciences, as well as in the field of social sciences - at a general level	P7U_W	P7S_WG	A.W7, A.W19, A.W30, B.W1, E.W10; A.W1, A.W4, A.W5, A.W14; B.W5, B.W17, B.W21; A.W29, A.W30, A.W31.
1.1.3	medicinal products, medicinal substances and substances used to produce medicines, pharmaceutical technology, the effects of medicinal substances and products on the human body	P7U_W	P7S_WG	C.W6, C.W36, D.W10, D.W39, E.W5; B.W22, C.W1, C.W12, C.W15, D.W1, D.W3, D.W13; C.W25, C.W26, C.W29, C.W33, C.W37; D.W11, D.W12, D.W13, D.W14, D.W15, D.W22, D.W23, D.W34, D.W41.
1.1.4	the methods and techniques of testing medicinal substances and products in terms of physicochemical, pharmaceutical, pharmacokinetic, pharmacological, toxicological and clinical aspects	P7U_W	P7S_WG	B.W3, B.W10, B.W11, B.W23; C.W5, C.W6, C.W7, C.W8, C.W36; D.W1, D.W4, D.W8, D.W9; D.W7, D.W12, D.W13, D.W14; D.W21, D.W23, D.W25, D.W27, D.W28, E.W23, E.W10.
1.1.5	the principles of practical specialist pharmacotherapy in the field of family	P7U_W	P7S_WG	D.W17, E.W10, E.W12, E.W13, E.W15, E.W16, E.W17.

⁵ Dla kierunków: lekarskiego, lekarsko - dentystycznego efekty uczenia się nabywane na ostatnim roku studiów w zakresie Praktycznego Nauczania Klinicznego

	medicine, internal medicine, pediatrics and geriatrics			
1.1.6	the principles of pharmacotherapeutic treatment and the use of drugs, medical devices and foodstuffs for special nutritional purposes in the therapeutic process	P7U_W	P7S_WG	D.W19, D.W33, D.W34, D.W35, D.W37, E.W10, E.W11, E.W18.
1.1.7	the principles of pharmaceutical care	P7U_W	P7S_WG	E.W8, E.W9, E.W13.
1.1.8	the ethical, legal and social conditions for practicing the profession of pharmacist	P7U_W	P7S_WG	A.W31, E.W4, E.W23, E.W28, E.W29, E.W30.
OGÓLNE EFEKTY UCZENIA SIĘ – UMIEJĘTNOŚCI (potrafi)				
1.2.1	to prepare medicines and assess their quality and trade in medicinal products and medical devices	P7U_U	P7S_UW	C.U14, C.U15, C.U16, C.U20, C.U21, C.U25, C.U26, E.U1, E.U2, E.U4.
1.2.2	to supervise the circulation, storage and use of medicinal substances and products, medical devices and foodstuffs for particular nutritional uses	P7U_U	P7S_UW	C.U26, D.U31, E.U1, E.U2, E.U4, E.U8.
1.2.3	to conduct chemical, pharmaceutical, pharmacological, toxicological research as well as research on the effectiveness and safety of medicinal substances and products	P7U_U	P7S_UW	B.U4, B.U7, B.U8, B.U10; C.U6, C.U7, C.U12, C.U27, C.U29; D.U4, D.U11, D.U13, D.U14; D.U18, D.U19, D.U20, D.U21, D.U22; C.U8, D.U4, E.U9, E.U28.
1.2.4	to search, analyze and interpret information on medicinal substances and products	P7U_U	P7S_UW	B. U12, C.U4, C.U34, D.U5, D.U16, E.U15, E.U25, F.U3.
1.2.5	to use his/her knowledge and skills for the benefit of the patient, in order to support and supervise the processes related to the use of drugs in therapy, diagnosis and prevention of diseases	P7U_U	P7S_UK	D.U16, D.U30, D.U35, E.U10, E.U11, E.U12, E.U13, E.U14.
1.2.6	to provide pharmaceutical advice and provide pharmaceutical care	P7U_U	P7S_UK	E.U5, E.U6, E.U8, E.U17.
1.2.7	to use knowledge in the field of rationalization and optimization of therapy, cooperating in a therapeutic team	P7U_U	P7S_UO	D.U17, E.U7, E.U13.
1.2.8	to plan his/her own educational activities and continuously educate himself/herself in order to update his/her knowledge	P7U_U	P7S_UU	E.U1, E.U2, E.U19, E.U30, F.U2.
1.2.9	inspire the learning process of others	P7U_U	P7S_UK	E.U13, E.U14, E.U19, E.U26.
1.2.10	to communicate with the patient and his family in an atmosphere of trust, taking into account the patient's needs and rights	P7U_U	P7S_UK	A.U2, E.U17, E.U30, E.U31, E.U32

1.2.11	to communicate with teammates and share knowledge	P7U_U	P7S_UK	A.U19, A.U21, E.U3, E.U23, E.U32.
1.2.12	to critically evaluate the results of scientific research and adequately justify a position	P7U_U	P7S_UW	D.U5, E.U20, E.U25, E.U28, F.U3, F.U4, F.U5