**description of the course of study**

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| **Course code** | **0912-7LEK-C-PT** | |
| **Name of the course in** | Polish | **Farmakologia z toksykologią** |
| English | **Pharmacology with toxicology** |

1. **LOCATION OF THE course OF STUDY within the system of studies**

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| **1.1. Field of study** | medical |
| **1.2. Mode of study** | Full-time |
| **1.3. Level of study** | Uniform Master’s studies |
| **1.4. Profile of study\*** | General academic |
| **1.5. Person preparing the course description** | dr hab. n. med. Ewa Orlewska, prof UJK |
| **1.6. Contact** | piotr.rafalski@ujk.edu.pl |

1. **General characteristicS of the course of study**

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| **2.1. Language of instruction** | English |
| **2.2. Prerequisites\*** | Physiology. biochemistry |

1. **DETAILED CHARACTERISTICS OF THE COURSE OF STUDY**

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| * 1. **Form of classes** | | Lectures: 45h (including 10 hours e-learning); classes: 80h (including e-learning: 6 hours) |
| * 1. **Place of classes** | | Lectures and classes – courses in teaching rooms of the UJK, e-learning platform |
| * 1. **Form of assessment** | | Written final exam; classes- two semester tests  Students are required to be prepared for classes (according to the specified outline). Students should actively participate in class discussions. Students take the test of theoretical knowledge at the end of each semester.  Course ends with an exam after completing the 6th semester of III year. Students who have completed the 5th and 6th semester are admitted to the final exam. |
| * 1. **Teaching methods** | | Conversational lecture, discussion, case study. |
| * 1. **Bibliography** | **Required reading** | 1. Katzung BG: Basic and clinical pharmacology.15th Ed. McGraw Hill Education Lange 2020 2. Brenner GM, Stevens CW: Brenner and Stevens’ Pharmacology. 5th Ed. Elsevier 2017 |
| **Further reading** | 1. Whalen K: Lippincott's Illustrated Reviews: Pharmacology. 7th Ed. Wolters Kluwer 2018 2. Brunton LL et al.: Goodman & Gilman’s The Pharmacological Basis of Therapeutics. 13th Ed. McGraw Hill 2017 |

1. **Objectives, syllabus CONTENT and intended LEARNING outcomes**

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| * 1. **Course objectives *(including form of classes)***   The aim of the subject of "Pharmacology and Toxicology" is to teach medical students the principles of rational pharmacotherapy and to present the benefits and risks associated with pharmacotherapy. After completing the pharmacology course students should know the general concepts and issues of pharmacodynamics, pharmacokinetics, pharmacoeconomics, principles of drug reaction and have knowledge of various groups of drugs in terms of mechanisms of action, clinical effects in the system, indications and contraindications, side effects, interactions and principles of dosage. |
| * 1. **Detailed syllabus *(including form of classes)***  1. Introduction to pharmacology 2. Basic pharmacokinetics 3. Basic pharmacoeconomics 4. Pharmacodynamics. 5. Pharmacogenetics, pharmacogenomics and personalized medicine 6. Autacoids 7. Analgesic-antipyretic and anti-inflammatory drugs. Opioid analgesics and cannabinoids. 8. Pharmacology of autonomic nervous system 9. Drugs acting at synaptic and neuroeffector junctional sites 10. Drugs acting on the central nervous system 11. Local anaesthetics, general anaesthetics 12. Therapy of Parkinson disease and epilepsies, 13. Drugs affecting renal and cardiovascular function; Anti-arrhythmic drugs, therapy of heart failure, myocardial ischaemia; Therapy of hypercholesterolemia and dyslipidaemia 14. Treatment of water-electrolyte imbalance 15. Drugs used in respiratory diseases, therapy of asthma 16. Drugs affecting gastrointestinal function; drugs used for control of gastric acidity, treatment of peptic ulcers, prokinetic drugs, antiemetic drugs, drugs used in diarrhoea, constipation 17. Drugs acting on the blood and blood forming organs; anticoagulant, thrombolytic, antiplatelet drugs, haematopoietic agents, blood and blood derivatives 18. Hormones and hormone antagonists; Pituitary hormones, thyroid and antithyroid drugs, oestrogens and progestins, androgens, adrenocortical hormones, insulin, glucagon, agents affecting calcification and bone turnover. 19. Chemotherapy of parasitic, bacterial, viral and fungal infections 20. Chemotherapy of neoplastic diseases 21. Immunotherapy 22. Vitamins and diet supplements 23. Clinical toxicology 24. Prescription. Prescription elements. General rules for prescribing medication. Rules for prescribing medicine from the N list. Dosage of medicines to children. 25. Drug addiction and drug abuse. |

**4.3 Intended learning outcomes**

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| **Code** | **A student, who passed the course** | **Relation to learning outcomes** |
| within the scope of **knowledge** the graduate knows and understands**:** | | |
| W01 | genetic mechanisms, the acquisition of drug resistance by microorganisms and tumor cells; | C.W11. |
| W02 | individual groups of drugs; | C.W35. |
| W03 | the main mechanisms of the effects of drugs and their transformations in the organism depending on the age; | C.W36. |
| W04 | the impact of disease processes on the metabolism and elimination of drugs; | C.W37. |
| W05 | the basic principles of pharmacotherapy; | C.W38. |
| W06 | the important side effects of drugs, including those resulting from their interaction; | C.W39. |
| W07 | the problem of drug resistance, including multi-drug resistance; | C.W40. |
| W08 | the indications for genetic testing performed to ensure the individualization of pharmacotherapy; | C.W41. |
| W09 | the basic trends of therapy development, in particular the possibility of applying cell therapy, gene therapy as well as targeted therapy in specific diseases; | C.W42. |
| W10 | the basic concepts of general toxicology; | C.W43. |
| W11 | groups of drugs whose abuse can lead to poisoning; | C.W44. |
| W12 | symptoms of the most common acute poisonings, including poisoning with alcohol, drugs and other psychoactive substances, heavy metals and selected classes of drugs; | C.W45. |
| W13 | the basic principles of diagnostic poisoning; | C.W46. |
| within the scope of **ABILITIES** the graduate knows how to: | | |
| U01 | perform simple pharmacokinetic calculations; | C.U13. |
| U02 | select drugs at appropriate doses for correcting the pathological phenomena in the body and in individual organs; | C.U14. |
| U03 | design the scheme of rational infection chemotherapy, both empirical and targeted; | C.U15. |
| U04 | prepare transcripts of all forms of prescription of medicinal substances | C.U16. |
| U05 | use pharmaceutical directories and databases of medicinal products; | C.U17. |
| U06 | assess toxicological danger in specific age groups and in the states of liver and kidney failure, as well as prevent drug intoxication; | C.U18. |
| U07 | interpret the results toxicological tests; | C.U19. |

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| within the scope of **SOCIAL COMPETENCE**, the graduate is able to: | | |
| K01 | recognize his/her own limitations and self-evaluate educational deficiencies and needs; | H.S5 |
| K02 | use reliable information sources; | H.S7 |
| K03 | conclude on the basis of own surveys and observations; | H.S8 |
| K04 | introduce rules of social conduct and teamwork to the group of specialists, including specialists form other medical professions also in the multicultural and multinational environment; | H.S9 |
| K05 | give opinions concerning various aspects of professional activity; | H.S10 |
| K06 | take responsibility for own decisions made during professional activities including own safety and safety of other people; | H.S11 |

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| * 1. **Methods of assessment of the intended learning outcomes** | | | | | | | | | | | | | | | | | | | | | |
| **Teaching**  **outcomes**  ***(code)*** | **Method of assessment (+/-)** | | | | | | | | | | | | | | | | | | | | |
| **Exam oral/written\*** | | | **Test\*** | | | **Project\*** | | | **Effort**  **in class\*** | | | **Self-study\*** | | | **Group work\*** | | | **Obseration** | | |
| ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | |
| *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* |
| W01 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W02 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W03 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W04 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W05 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W06 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W01 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W02 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W03 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W04 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W05 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W06 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W07 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W08 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W09 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W10 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W12 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W13 | ***+*** | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U01 |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U02 |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U03 |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U04 |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U05 |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U06 |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U07 |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| K01-K06 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ***+*** | ***+*** |  |

***\*delete as appropriate***

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| * 1. **Criteria of assessment of the intended learning outcomes** | | |
| **Form of classes** | **Grade** | **Criterion of assessment** |
| **lecture (L)** | **3** | 61%-68% the maximum points available |
| **3,5** | 69%-76% the maximum points available |
| **4** | 77%-84% the maximum points available |
| **4,5** | 85%-92% the maximum points available |
| **5** | 93%-100% the maximum points available |
| **classes (C)\*** | **3** | 61%-68% the maximum points available |
| **3,5** | 69%-76% the maximum points available |
| **4** | 77%-84% the maximum points available |
| **4,5** | 85%-92% the maximum points available |
| **5** | 93%-100% the maximum points available |

1. **BALANCE OF ECTS CREDITS – STUDENT’S WORK INPUT**

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| **Category** | **Student's workload** |
| **Full-time**  **studies** |
| *NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/* | **125** |
| *Participation in lectures\** | **35** |
| *Participation in classes, seminars, laboratories\** | **72** |
| *Preparation in the exam/ final test\** |  |
| *Others\** | **16**1 |
| *INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/* | **175** |
| *Preparation for the lecture\** | **105** |
| *Preparation for the classes, seminars, laboratories\** | **70** |
| *Preparation for the exam/test\** |  |
| *Gathering materials for the project/Internet query\** |  |
| *Preparation of multimedia presentation* |  |
| *Others (please specify e.g. e-learning)\** |  |
| *TOTAL NUMBER OF HOURS* | **300** |
| ECTS credits for the course of study | **12** |

***\*delete as appropriate***

***Accepted for execution*** *(date and legible signatures of the teachers running the course in the given academic year)*

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1 e-learning (without participation of the lecturer)