**SYLLABUS**

1. **Programme Details**

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| **1.1.** | **„GRIGORE T. POPA“ UNIVERSITY OF MEDICINE AND PHARMACY IASI** | | | | | | | |
| **1.2.** | **FACULTY : MEDICINE / DEPARTMENT: MORPHOFUNCTIONAL SCIENCES II** | | | | | | | |
| **1.3.** | **DISCIPLINE: PHARMACOLOGY, ALGESIOLOGY** | | | | | | | |
| **1.4.** | **FIELD of STUDY:** **HEALTH** | | | | | | | |
| **1.5.** | **STUDY CYCLE: BACHELOR** | | | | | | | |
| **1.6.** | **PROGRAMME of STUDY: Medicine - English** | | | | | | | |
| 1. **Discipline Details** | | | | | | | | |
| **2.1.** | **Name of the Discipline: PHARMACOLOGY-ALGESIOLOGY** | | | | | | | |
| **2.2.** | **Teaching staff in charge with lectures:** Professor Dr. Ghiciuc Cristina Mihaela, Associate professor Dr. Mititelu-Tarţău Liliana | | | | | | | |
| **2.3.** | **Teaching staff in charge with seminar activities:** Professor Dr. Ghiciuc Cristina Mihaela, Associate professor Dr. Mititelu-Tarţău Liliana, Assist. Dr. Damian Lisandra, Assist. Dr. Grosu Ionela Alina | | | | | | | |
| **2.4. Year** | | **IV** | **2.5. Semester** | **I/II** | **2.6. Type of evaluation** | **C1/C2** | **2.7. Discipline regimen** | **Compulsory** |

1. **Overall Time Estimates (hours/semester of didactic activity)**

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| --- | --- | --- | --- | --- | --- | --- |
| * 1. **Number of hours per week** | **4** | **Of which: 3.2. lectures** | | **2** | * 1. **seminar/ laboratory** | **2** |
| * 1. **Total hours in the curriculum** | **36** | **Of which: 3.5. lectures** | | **18** | **3.6. seminar/ laboratory** | **18** |
| **Distribution of time** |  |  | |  |  | Hours |
| **Study time using coursebook materials, bibliography and notes** | | | | | | **8** |
| **Further study time in the libray, online and in the field** | | | | | | **2** |
| **Preparation time for seminars / laboratories, homework, reports, portfolios and essays** | | | | | | **2** |
| **Tutoring** | | | | | | **2** |
| **Examinations** | | | | | | **2** |
| **Other activities** | | | | | | **-** |
| **3.7. Total hours of individual study** | | |  | | | **14** |
| **3.8. Total hours / semester** | | |  | | | **50** |
| **3.9. Number of credits** | | |  | | | **2** |

1. **Prerequisites (where applicable)**

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| **4.1. curriculum** | Physilogy, Biochemistry, Pharmacolgy III year |  |
| **4.2. competences** | Not applicable |  |

1. **Conditions (where applicable)**

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| **5.1. for lecture delivery** | Not applicable |  |
| **5.2. for seminar / laboratory delivery** | Not applicable |  |

1. **Specific Competences Acquired**

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| **Professional Competences (knowledge and skills)** | * knowledge of the main mechanisms of drug action; * knowledge of the basic data on drugs pharmacokinetics; * knowledge of the main indications, contraindications, adverse effects and interactions of drugs as options for clinical drug therapy; * knowledge of drugs dosage forms; * knowledge of doses and units of measure used in pharmacology; * ability for writing prescriptions; * knowledge of basic data of pharmacovigilance; * knowledge on the particularities of main types of drug dependence. |
| **Transversal Competences (roles, personal and professional development)** | * knowledge on adverse effect, toxic effect, types of drug interactions; * knowledge of basic data on the importance of pharmacovigilence for medical practice; * knowledge of general principles of treatment in various drug intoxications and non-drug intoxications. |

1. **Objectives of the Discipline (related to the acquired competences)**

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| **7.1. General Objective** | To acquire basic concepts of pharmacology and of writing medical orders with drugs from the studied groups. |
| **7.2. Specific Objectives** | 1. the study of the main mechanisms of action of drugs;  2. knowledge of the particularities of the pharmacokinetics of drugs in order to understand the main indications, contraindications, adverse effects and drug interactions of drugs;  3. pharmaceutical forms of drugs, the dose and the units of measurement used in pharmacology, the general rules of pharmacography;  4. presentation of differences between adverse reaction and toxic response;  5. presentation of the importance of pharmacovigilance;  6. study of the general principles of treatment in some intoxications;  7. the presentation of the characteristics of the main types of drug dependence. |

1. **Contents**

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| **8.1. Lecture** | **Teaching methods** | **Comments** |
| 1. Drugs acting on central nervous system (CNS). Opioids. Cough suppressants and expectorants drugs. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
| 2. Drugs acting on CNS. Anxiolytic – sedative – hypnotic drugs. Local and general anesthetics. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
| 3. Drugs acting on CNS. Antiseizure drugs. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
| 4. Drugs acting on CNS. Antipsychotic agents. Antidepressant agents. Drugs of abuse. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
| 5. Skeletal muscle relaxants. Pharmacologic management of parkinsonism and other movement disorders. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
| 6. Nonsteroidal antiinflammatory drugs (NSAIDs). Analgesic – antipyretic drugs without anti-inflammatory effect. Disease-modifying antirheumatic drugs. Drugs used in gout. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
| 7. Pharmacology of endocrine system: drugs affecting hypothalamic and pituitary gland hormones; drugs affecting adrenocortical hormones. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
| 8. Pharmacology of endocrine system: drugs affecting thyroid hormones; agents that influence bone mineral homeostasis; drugs affecting pancreatic hormones. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
| 9. Pharmacology of endocrine system: Drugs affecting sex hormones – analogues and antagonists. Hormonal contraception. | - Systematic exposure method, participatory lecture method, exposure to the opponent, interrogative methods, method of discussions, the method of introducing the problem, case study method, project or research topic. | 2 hours |
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| **Bibliography**  1. Arbit B, Nishimura M, Hsu JC. Reversal agents for direct oral anticoagulants: A focused review*. Int J Cardiol.* 2016, 223: 244-250.  2. Brunton LL et al. *Goodman and Gilman's The Pharmacological Basis of Therapeutics,* 12th Edition. New York: McGraw-Hill, 2011.  3. Cristea Aurelia Nicoleta. *Tratat de farmacologie,* Ediţia I, Editura Medicală Bucureşti, 2013.  4. Devalia V, Hamilton MS, Molloy AM. British Committee for Standards in Haematology. Guidelines for the diagnosis and treatment of cobalamin and folate disorders. *Br J Haematol* 2014, 166(4): 496-513.  5. Etienne-Selloum Nelly, Faure Sébastien. *Du mécanisme d'action des médicaments à la thérapeutique. Sciences du médicament,* Collection sous la direction de Jean-Paul Belon, Elsevier Masson SAS, 2015.  6. Faure Sébastien, Guerriaud Mathieu, Clère Nicolas. *Bases fondamentales en pharmacologie: Sciences du médicament,* Collection sous la direction de Jean-Paul Belon, Elsevier Masson SAS, 2014.  7. Fulga Ion. *Farmacologie,* Editura Medicală Bucureşti, 2010.  8. Cristina Mihaela Ghiciuc. *Pharmacology,* „Grigore T. Popa“ Publisher, U.M.F. Iaşi, 2014.  9. Katzung BG, Masters BS, Trevor JA. *Basic and Clinical Pharmacology,* 12th Edition, LANGE Basic Science. New York: McGraw-Hill, 2012.  10. Lupuşoru Cătălina Elena, Cristina Mihaela Ghiciuc. *Farmacologia în „comprimate“,* Ed. Alfa, 2009.  11. Cătălina Elena Lupușoru, Cristina Mihaela Ghiciuc, Liliana Mititelu-Tarţău, Raoul Vasile Lupușoru. *Farmacologie, teste de autoevaluare pentru studenții anului III,* Ed. Junimea, *2017.*  12. Cătălina Elena Lupușoru, Liliana Mititelu-Tarţău, Cristina Mihaela Ghiciuc, Raoul Vasile Lupușoru. *Farmacologie, teste de autoevaluare pentru studenții anului IV,* Ed. Junimea, *2017.*  13. Mani H, Lindhoff-Last E. New oral anticoagulants in patients with nonvalvular atrial fibrillation: a review of pharmacokinetics, safety, efficacy, quality of life, and cost effectiveness. *Drug Des Devel Ther.* 2014; 8:789-798.  14. Neal Michaël. *Pharmacologie médicale,* 5ème Édition, De Boeck, 2013.  15. Rang HP, Ritter JM, Flower RJ, Henderson G. *Rang and Dale's Pharmacology,* 8th Edition, Elsevier Churchill Livingstone, 2015.  16. Stahl M. Stephen. *The Prescriber ̓ s Guide Antidperessants, Stahl ̓ s Essential Psychopharmacology,* Fourth Edition, Cambridge University Press, 2011.  17. Liliana Mititelu-Tarţău, Cătălina Elena Lupuşoru. *Farmacologia efectelor adverse şi toxice,* Ed. Junimea, Iaşi, 2015.  18. Liliana Mititelu-Tarţău, Cristina Mihaela Ghiciuc. *Multiple Choice Questions for fourth year students Pharmacology.* Ed. Junimea,2017.  \*\*\* *Le Guide des premières Ordonnances,* Éditions de Santé, 2012.  *\*\*\* NOAC GUIDELINES.* *Non-Vitamin K Antagonist. Oral Anticoagulant Updated*, Clinical Excellence Commission, Updated 2017. | | |
| **8.2. Seminar / Laboratory** | **Teaching methods** | **Comments** |
| *1. Dosage forms of drugs. Compounded and precompounded prescriptions – general rules.* Compounded prescription: oral solution, syrup. | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| *2. Dosage forms of drugs. Compounded and precompounded prescriptions – general rules*. Compounded prescription: packages, cachets. *Discussions from lectures:* pharmacodynamic particularities of opioids used in therapy. Acute *intoxication* with opioids. Addiction to opioids. *Experimental demonstration* of analgesic effect of morphine; "trunk rigidity" induced by *morphine.* | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| *3. Compounded prescriptions:* ointment, pessaries. Restricted regimen prescriptions. *Discussions from lectures:* particularities of administration of anxyolytic – sedative – hypnotic drugs depending on associated diseases; adverse effects and interactions of different types of anesthetics. Acute *intoxication* and addiction to benzodiazepine. Acute intoxication and addiction to barbiturates. *Experimental demonstration* of the effects of local anesthetics and inhalatory volatile liquid general anesthetic. | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| *4. Compounded prescriptions:* enema, suppositories. Restricted regimen prescriptions. *Discussions from lectures:* pharmacokinetics and pharmacodynamic particularities of antiseizures drugs, effects of a substance on CNS (behavioral tests). Acute and chronic *intoxication* with ethanol. Acute intoxication with methanol. *Experimental demonstration* of the sedative-hypnotics and anticonvulsants effects of *phenobarbital.* | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| *5. Precompounded prescriptions:* tablets, capsules, dragees, syrup, solution for oral administration. *Discussions from lectures:* indications, adverse effects and interactions of different antipsychotic drugs and of antidepressant drugs. *Experimental demonstration* of the effects of substances on the CNS. Tests of motor disability and behavioral tests. | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| *6. Precompounded prescriptions:* solution for parenteral administration. *Discussions from lectures:* therapeutic implications of mechanisms of action of skeletal muscle relaxants and of antiparkinsonian drugs. | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| *7. Precompounded prescriptions:* eye drops, nasal drops, ear drops, mouth washes, suppositories, pessaries. *Discussions from lectures:* particularities of administration of NSAIDs. Acute *intoxication* with *Acethylsalicilic acid.* Acute intoxication with *Acetaminophen.* *Experimental demonstration* of analgesic and anti-inflammatory effects of NSAIDs. | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| *8. Precompounded prescription:* powder for parenteral use, ointment, patch transdermic, trochists. *Discussions from lectures:* supraphysiological doses of corticosteroids – indications, contraindications, adverse effects. | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| *9. Prescriptions: associations of drugs.* Compounded and precompounded prescription - review. *Adverse effects and toxic effecs* of drugs; pharmacovigilance report. *Discussions from lectures:* groups of pharmacologically active agents that affect carbohydrate metabolism; adverse effects of oral contraceptives. | - Expository methods, exposure to opponent, interrogative methods, method of discussions and debates, the method of introducing the problem, case study method, project or topic of research, the experiment, the method of games, learning through research documents, demonstration methods, the method of practical exercises, simulation methods. | 2 hours |
| **Bibliography**  1. Arbit B, Nishimura M, Hsu JC. Reversal agents for direct oral anticoagulants: A focused review*. Int J Cardiol.* 2016, 223: 244-250.  2. Brunton LL et al. *Goodman and Gilman's The Pharmacological Basis of Therapeutics,* 12th Edition. New York: McGraw-Hill, 2011.  3. Cristea Aurelia Nicoleta. *Tratat de farmacologie,* Ediţia I, Editura Medicală Bucureşti, 2013.  4. Devalia V, Hamilton MS, Molloy AM. British Committee for Standards in Haematology. Guidelines for the diagnosis and treatment of cobalamin and folate disorders. *Br J Haematol* 2014, 166(4): 496-513.  5. Etienne-Selloum Nelly, Faure Sébastien. *Du mécanisme d'action des médicaments à la thérapeutique. Sciences du médicament,* Collection sous la direction de Jean-Paul Belon, Elsevier Masson SAS, 2015.  6. Faure Sébastien, Guerriaud Mathieu, Clère Nicolas. *Bases fondamentales en pharmacologie: Sciences du médicament,* Collection sous la direction de Jean-Paul Belon, Elsevier Masson SAS, 2014.  7. Fulga Ion. *Farmacologie,* Editura Medicală Bucureşti, 2010.  8. Cristina Mihaela Ghiciuc. *Pharmacology,* „Grigore T. Popa“ Publisher, U.M.F. Iaşi, 2014.  9. Katzung BG, Masters BS, Trevor JA. *Basic and Clinical Pharmacology,* 12th Edition, LANGE Basic Science. New York: McGraw-Hill, 2012.  10. Lupuşoru Cătălina Elena, Cristina Mihaela Ghiciuc. *Farmacologia în „comprimate“,* Ed. Alfa, 2009.  11. Cătălina Elena Lupușoru, Cristina Mihaela Ghiciuc, Liliana Mititelu-Tarţău, Raoul Vasile Lupușoru. *Farmacologie, teste de autoevaluare pentru studenții anului III,* Ed. Junimea, *2017.*  12. Cătălina Elena Lupușoru, Liliana Mititelu-Tarţău, Cristina Mihaela Ghiciuc, Raoul Vasile Lupușoru. *Farmacologie, teste de autoevaluare pentru studenții anului IV,* Ed. Junimea, *2017.*  13. Mani H, Lindhoff-Last E. New oral anticoagulants in patients with nonvalvular atrial fibrillation: a review of pharmacokinetics, safety, efficacy, quality of life, and cost effectiveness. *Drug Des Devel Ther.* 2014; 8:789-798.  14. Neal Michaël. *Pharmacologie médicale,* 5ème Édition, De Boeck, 2013.  15. Rang HP, Ritter JM, Flower RJ, Henderson G. *Rang and Dale's Pharmacology,* 8th Edition, Elsevier Churchill Livingstone, 2015.  16. Stahl M. Stephen. *The Prescriber ̓ s Guide Antidperessants, Stahl ̓ s Essential Psychopharmacology,* Fourth Edition, Cambridge University Press, 2011.  17. Liliana Mititelu-Tarţău, Cătălina Elena Lupuşoru. *Farmacologia efectelor adverse şi toxice,* Ed. Junimea, Iaşi, 2015.  18. Liliana Mititelu-Tarţău, Cristina Mihaela Ghiciuc. *Multiple Choice Questions for fourth year students Pharmacology.* Ed. Junimea,2017.  \*\*\* *Le Guide des premières Ordonnances,* Éditions de Santé, 2012.  *\*\*\* NOAC GUIDELINES.* *Non-Vitamin K Antagonist. Oral Anticoagulant Updated*, Clinical Excellence Commission, Updated 2017. | | |

1. **Correlations between the contents of the discipline and the expectations of the epistemic community, of profesional associations and of employers in the field**

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| The knowledge and the skills are established as didactic objectives and specified as such in the curricula that are revised annually. After the analysis performed at the discipline level, these are discussed and approved by the Curricular Bureau, in order to harmonize them with other disciplines. During all this process, an evaluation is performed concerning the correspondence between the contents and the expectations of the academical community, community representatives, professional associations and employers. As a primary objective, the discipline aims to offer the students optimal prerequisites for the following years of the Medicine bachelor study cycle, in order to be able to involve successfully in internship programs in Romania and in other countries from the European Union, immediately after graduation. |  |

1. **Evaluation**

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| **Type of activity** | **10.1. Evaluation criteria:** | **10.2. Methods of evaluation** | **10.3. Percentage of final grade** |
| **10.4. Lecture** | Grade for multiple choice test | standardized multiple choice test | 50% |
| **10.5. Seminar / Laboratory** | Average grade of ongoing examinations | ongoing evaluation | 10% |
| Grade for practical examination | practical exam | 40% |
| **Minimum standard of performance: at least grade 5 to pass the discipline** | | | |

**Date: 26.09.2018. Signature of Didactic Coordinator,**

**Prof. Elena Cătălina Lupuşoru, MD, Ph.D.**

**Signature of Department Director,**

**Prof. Carmen Elena Cotrutz, MD, Ph.D**