**SYLLABUS**

1. **Programme Details**

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| **1.1.** | **GRIGORE T. POPA UNIVERSITY OF MEDICINE AND PHARMACY IASI** | | | | | | | |
| **1.2.** | **FACULTY : MEDICINE / DEPARTMENT:** DEPARTMENT: MORPHOFUNCTIONAL SCIENCES II | | | | | | | |
| **1.3.** | **DISCIPLINE:** Clinical PHARMACOLOGY | | | | | | | |
| **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:** Clinical PHARMACOLOGY | | | | | | | |
| **2.2.** | **Teaching staff in charge with lectures:** prof.dr. Cristina-Mihalea Ghiciuc, conf.dr. Liliana Mititelu-Tartau | | | | | | | |
| **2.3.** | **Teaching staff in charge with seminar activities:** prof.dr. Cristina-Mihalea Ghiciuc, conf.dr. Liliana Mititelu-Tartau, sef.lucr.dr. Magdalena Cuciureanu, , asist univ Beatrice Rozalina Buca, asist.dr. Ionela Alina Grosu-, asit.univ. Aurelia Cretu | | | | | | | |
| **2.4. Year** | | **III** | **2.5. Semester** | **I** | **2.6. Type of evaluation** |  | **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** | 56 | **Of which: 3.5. lectures** | | 28 | **3.6. seminar/ laboratory** | 28 |
| **Distribution of time** |  |  | |  |  | Hours |
| **Study time using coursebook materials, bibliography and notes** | | | | | | 30 |
| **Further study time in the libray, online and in the field** | | | | | | 10 |
| **Preparation time for seminars / laboratories, homework, reports, portfolios and essays** | | | | | | 15 |
| **Tutoring** | | | | | | 5 |
| **Examinations** | | | | | | 15 |
| **Other activities** | | | | | | 5 |
| **3.7. Total hours of individual study** | | |  | | | 44 |
| **3.8. Total hours / semester** | | |  | | | 154 |
| **3.9. Number of credits** | | |  | | | **4** |

1. **Prerequisites (where applicable)**

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| **4.1. curriculum** | Fundamental notions about physiologie, cellular biology, biochemistry, genetics, immunology, microbiology |
| **4.2. competences** |  |

1. **Conditions (where applicable)**

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| **5.1. for lecture delivery** |  |
| **5.2. for seminar / laboratory delivery** |  |

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. **Obiectives of the Discipline (related to the acquired competences)**

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| **7.1. General Obiective** | To acquire basic concepts of pharmacology and of writing medical orders with drugs from the studied groups. |
| **7.2. Specific Obiectives** | 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. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 2. Drugs acting on CNS. Anxiolytic – sedative – hypnotic drugs. Local and general anesthetics. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 3. Drugs acting on CNS. Anti-seizure drugs. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 4. Drugs acting on CNS. Antipsychotic agents. Antidepressant agents. Drugs of abuse. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 5. Skeletal muscle relaxants. Pharmacologic management of parkinsonism and other movement disorders. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 6. Nonsteroidal anti-inflammatory drugs (NSAIDs). Analgesic – antipyretic drugs without anti-inflammatory effect. Disease-modifying anti-rheumatic drugs. Drugs used in gout. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 7. Pharmacology of endocrine system: drugs affecting thyroid hormones; drugs affecting adrenocortical hormones. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 8. Pharmacology of endocrine system: drugs affecting pancreatic hormones; drugs affecting sex hormones – analogues and antagonists. Hormonal contraception. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 9. Pharmacology of endocrine system: drugs affecting hypothalamic and pituitary gland hormones; agents that influence bone mineral homeostasis. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 10. Pharmacotherapeutic approaches in cardiovascular pathology: High blood pressure | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 11. Pharmacotherapeutic approaches in cardiovascular pathology: coronary heart disease, heart failure | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 12. Pharmacotherapeutic approaches in respiratory pathology: Bronchial asthma, chronic obstructive pulmonary disease | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 13. Drug discovery and development. Preclinical development - studies of pharmacodynamics, pharmacokinetics and toxicity in laboratory animals | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 14. Evaluation of drugs on human subjects. Rational design of clinical trials, types of clinical trials, interpretation of results | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| **Bibliography**   1. **Brunton LL et al. Goodman and Gilman's The Pharmacological Basis of Therapeutics, 12th Edition. New York: McGraw-Hill, 2011.** 2. **Cristea Aurelia Nicoleta. Tratat de farmacologie, Ediţia I, Editura Medicală Bucureşti, 2013.** 3. **Fulga Ion. Farmacologie, Editura Medicală Bucureşti, 2010.** 4. **Katzung BG, Masters BS, Trevor JA. Basic and Clinical Pharmacology, 12th Edition, LANGE Basic Science. New York: McGraw-Hill, 2012.** 5. **Lupuşoru Cătălina Elena, Cristina Mihaela Ghiciuc. Farmacologia în „comprimate“, Ed. Alfa, 2009.** 6. **Liliana Mititelu-Tarţău, Cătălina Elena Lupuşoru. Farmacologia efectelor adverse şi toxice, Ed. Junimea, Iaşi, 2015.** 7. **Rang HP, Ritter JM, Flower RJ, Henderson G. Rang and Dale's Pharmacology, 8th Edition, Elsevier Churchill Livingstone, 2015.** 8. **Golan D.E. Principles of pharmacology – The pathophysiologic basis of drug therapy, 3rd editions, Wolters Kluwer, Lippincott Williams Wilkins, 2012** | | |
| **8.2. Seminar / Laboratory** | **Teaching methods** | **Comments** |
| 1. Safety rules during Pharmacology labs. Review: compounded and pre-compounded prescriptions – general rules. Compounded prescription: oral solution. Discussions from lectures: pharmacodynamics 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. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 2. Compounded prescription: syrup. 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 benzodiazepines. Acute intoxication and addiction to barbiturates. Experimental demonstration of the effects of local anesthetics and inhalatory volatile liquid general anesthetics. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 3. Compounded prescriptions: solution for inhalations, gargarisme (mouth-wash), eye drops, ear drops, nasal drops, drug enema. Restricted regimen prescriptions. Discussions from lectures: pharmacokinetics and pharmacodynamics particularities of anti-seizures drugs. Experimental demonstration of the sedative-hypnotic effects and anticonvulsants effects of phenobarbital. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 4. Compounded prescriptions: packages, cachets, suppositories, pessaries, ointment. 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. Acute and chronic intoxication with ethanol. Acute intoxication with methanol. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 5. Pre-compounded prescriptions: tablets, capsules, dragees, syrup, solution for oral administration, troches, Discussions from lectures: therapeutic implications of mechanisms of action of skeletal muscle relaxants and of antiparkinsonian drugs. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 6. Pre-compounded prescriptions: ointment, patches. Discussions from lectures: Particularities of administration of NSAIDs. Experimental demonstration of analgesic and anti-inflammatory effects of NSAIDs. Acute intoxication with Acethylsalicilic acid. Acute intoxication with Acetaminophen. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 7. Pre-compounded prescriptions: eye drops, nasal drops, ear drops, mouth washes. Discussions from lectures: supra-physiological doses of corticosteroids – indications, contraindications, adverse effects. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 8. Pre-compounded prescriptions: suppositories, pessaries; injectable solution, powder for parenteral use. Discussions from lectures: pharmacological influence of glucose metabolism; adverse effects of oral contraceptives. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 9. Prescriptions: associations of drugs. Compounded and pre-compounded prescription - review. Adverse effects and toxic effects of drugs; pharmacovigilance report. Discussions from lectures: Interaction of the renin - angiotensin – aldosterone system with thyroid hormones, pancreatic hormones, sex hormones. Interactions of the renin - angiotensin – aldosterone system with autonomic nervous system. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 10.Correlation of current treatment guidelines with the mechanisms of action of various classes of antihypertensive drugs. Identification of interactions between various classes of antihypertensive drugs. Presentation of clinical cases and therapeutic approaches in various forms of hypertension. Seminar with notions from the course. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 11.Correlation of current treatment guidelines with the mechanisms of action of the various classes of drugs used in coronary heart disease and heart failure. Identification of the interactions between various classes of drugs used in coronary heart disease and heart failure. Presentation of clinical cases and pharmacological therapeutic approaches. Seminar with notions from the course. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 12.Correlation of current treatment guidelines with the mechanisms of action of the various classes of medications used in asthma and chronic obstructive pulmonary disease. Identifying the interactions between various classes of medications used in asthma and chronic obstructive pulmonary disease. Presentation of clinical cases and pharmacological therapeutic approaches. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 13.Evaluation of the effectiveness of a new drug in experimental animal studies - choosing the experimental model, defining the experimental groups and the necessary determinations (examples - cardiovascular, neurological, metabolic, oncological). Toxicity assessment. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| 14.Defining the research question. Defining the study population - inclusion / exclusion criteria, recruitment of participants, randomization. The choice of measurements of biological variables. Case studies. | Lecture, explanation, demonstration, conversation.  Exposure with video projector. | 2 hours |
| **Bibliography**   1. Brunton LL et al. Goodman and Gilman's The Pharmacological Basis of Therapeutics, 12th Edition. New York: McGraw-Hill, 2011. 2. Cristea Aurelia Nicoleta. Tratat de farmacologie, Ediţia I, Editura Medicală Bucureşti, 2013. 3. Fulga Ion. Farmacologie, Editura Medicală Bucureşti, 2010. 4. Katzung BG, Masters BS, Trevor JA. Basic and Clinical Pharmacology, 12th Edition, LANGE Basic Science. New York: McGraw-Hill, 2012. 5. Lupuşoru Cătălina Elena, Cristina Mihaela Ghiciuc. Farmacologia în „comprimate“, Ed. Alfa, 2009. 6. Liliana Mititelu-Tarţău, Cătălina Elena Lupuşoru. Farmacologia efectelor adverse şi toxice, Ed. Junimea, Iaşi, 2015. 7. Rang HP, Ritter JM, Flower RJ, Henderson G. Rang and Dale's Pharmacology, 8th Edition, Elsevier Churchill Livingstone, 2015. 8. Golan D.E. Principles of pharmacology – The pathophysiologic basis of drug therapy, 3rd editions, Wolters Kluwer, Lippincott Williams Wilkins, 2012 | | |

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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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: 1.10.2019 Signiture of Didactic Co-ordinator**

**Prof. Dr. Radu Iliescu**

**Signiture of Department Director Prof.Dr. Carmen Elena Cotrutz**