**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:** GENERAL PHARMACOLOGY |
| **1.4.**  | **FIELD of STUDY:** **HEALTH** |
| **1.5.** | **STUDY CYCLE: BACHELOR**  |
| **1.6.** | **PROGRAMME of STUDY: Medicine - English**  |
| 1. **Discipline Details**
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| **2.1.** | **Name of the Discipline:** GENERAL PHARMACOLOGY  |
| **2.2.** | **Teaching staff in charge with lectures:**  prof.dr. Cristina-Mihalea Ghiciuc |
| **2.3.** | **Teaching staff in charge with seminar activities:** prof.dr. Cristina-Mihalea Ghiciuc, conf.dr. Liliana Mititelu-Tartau, conf.dr . Bogdan Ionel Tamba, sef.lucr. Gabriela Rusu-Zota, 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. General data about pharmacology: definitions, branches of pharmacology. Pharmacodynamics: mechanisms of action of drugs, structure – effect relationship, dose – effect relationship, therapeutic index, synergism and antagonism, adverse effects of drugs. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 2. Principles of pharmacokinetics: absorption of drugs, drug permeation, distribution of drugs, metabolism of drugs, elimination of drugs, main pharmacokinetic parameters, effects of repeated doses, pharmacokinetic models. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 3. Pharmacological influence of vegetative system. Cholinergic system and drugs: cholinoceptor activating drugs and acetylcholinesterase-inhibiting drugs. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 4. Pharmacological influence of vegetative system. Cholinergic system and drugs: cholinoceptor-blocking drugs. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 5. Pharmacological influence of vegetative system. Adrenergic system and drugs: adrenoceptor activating and other sympathomimetic drugs. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 6. Pharmacological influence of vegetative system. Adrenergic system and drugs: adrenoceptor antagonist drugs. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 7. Pharmacological influence of smooth muscle activity. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 8. Pharmacological influence of autacoids: biologically active amines, biologically active polypeptides, biologically active lipids and peptidolipids. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 9. Pharmacological influence of cardio-vascular system disorders: cardiac glycosides and other positive inotropic drugs, agents used in cardiac arrhythmias, drugs indicated in peripheral vascular disease. Pharmacological influence lipid metabolism: inhibitors of exogenous cholesterol, inhibitors of cholesterol synthesis, other lipid lowering drugs. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 10. Diuretics. Antidiuretics. Pharmacological influence of blood disorders: drugs used in anemias, drugs used in disorders of coagulation, blood replacement solutions. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 11. Chemotherapeutic drugs. Pharmacokinetic and pharmacodynamic particularities of chemotherapeutic drugs. Antibacterial chemotherapeutic drugs: penicillins, cephalosporins, carbapenemes, monobactames, polypeptides, glycopeptides, phosphomycines, Cycloserine, Bacitracine, Ristocetine, polymixines, phenicols. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 12. Chemotherapeutic drugs. Antibacterial chemotherapeutic drugs: aminoglycosides, aminocyclitols, macrolides, ketolides, streptogramines, tetracyclines, oxazolidinones, nitrofurans, lincosamides, fusidic acid, rifampicin, quinolones, sulfonamides, Trimetoprim. Drugs used to treat tuberculosis. Drugs used to treat leprosy. Antiseptic drugs with systemic administration. Antiseptic and disinfectant drugs. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 13. Chemotherapeutic drugs. Antifungal, antiviral, antiprotozoal and antihelmintic drugs. Cancer chemotherapy. Immunopharmacology.  | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 14. Pharmacological influence of gastrointestinal diseases: drugs used in the treatment of peptic ulcer; smooth muscle relaxant drugs indicated in gastrointestinal disorders, drugs stimulating gastrointestinal motility, antiemetic drugs, pancreatic enzyme substituents, laxatives, antidiarrheal agents, bile acid therapy for gallstones, drugs stimulating bile, drugs with hepatoprotector effect; drugs used in the treatment of inflammatory intestinal diseases. | 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**
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| **8.2. Seminar / Laboratory** | **Teaching methods**  | **Comments** |
| 1. Labor protection: rules to follow in the practical work of pharmacology. Introductory notions: active principles; medicine; the medicinal form; pharmacopoeia, criteria for classification of drugs; pharmacovigilance sheet. Medicinal forms: Oral administration drug forms; drug forms for administration to the oral and pharyngo-bronchial mucosa. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 2. Medicinal forms: medicinal forms with administration at the level of the conjunctival mucosa, auricles, nasal, rectal, vaginal and urethral mucosa; cutaneous drug forms; drug forms with parenteral administration. Experimental demonstration of drug synergism and antagonism. Experimental demonstration of the variation of the effects of the drugs depending on the dose and the route of administration. Seminar with concepts from the course: pharmacodynamic interactions.  | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 3. Dosages and units of measurement in pharmacology. General rules for writing compounded, officinal, precompounded prescriptions. Writing precompounded prescriptions: potion. Principles of legislation and ethics of experiments on laboratory animals. Statistical processing of results and their interpretation. Seminar with concepts from the course: pharmacokinetic interactions. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 4. Writing compounded:syrup, aqueous solution for internal use, infusion, decoction, gargle solution, mouthwash, inhalation solution. Seminar on the basics: side effects and toxic drugs. General rules of treatment in poisoning. Experimental evaluation of acute and chronic toxicity of a substance in the laboratory animal. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 5. Writing compounded prescriptions: eye drops, nasal drops, ear drops, medicine ointment. Seminar with concepts from the course: pharmacodynamic effects of parasympatholitics. Acute and chronic organophosphate intoxication. Acute intoxication and chronic nicotine intoxication. Acute atropine intoxication. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 6. Writing compounded prescriptions: drug powders, medicine pack, cachets, suppository, pessaries. Seminar with notions in the course: Catecholamine releasers and special sympathomimetics. Acute intoxication and chronic cocaine intoxication. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 7. Writing compounded prescriptions. Preparation of precompounded prescriptions: syrup, aqueous solution for internal use, tablets / film-coated tablets, dragees. Seminar with concepts from the course: pharmacodynamic effects of beta-blockers at cardiovascular and metabolic level. Carbon monoxide poisoning. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| **8. Writing precompounded prescriptions: gelatin capsules / spansules, medicine package, transdermal patch, medicine ointment, cream. Seminar with concepts from the course: groups of pharmacologically active agents with action in the vascular smooth muscle. Intoxication with methylxanthines. Cyanide poisoning. Acute intoxication with methemoglobinizing substances.** | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 9. Writing precompounded prescriptions: troches,, solutions for inhalations, solutions for gargle, sprays for oropharyngeal and respiratory mucosa (spray), mouthwash. Seminar with concepts from the course: groups of pharmacologically active agents with action at the level of the smooth bronchial muscles. Acute poisoning with organic solvents. | Lecture, explanation, demonstration, conversation.Exposure with video projector. Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 10. Writing precompounded prescriptions: eye drops, solutions for nasal instillations, solutions for auricular instillations. Seminar with notions in the course: groups of pharmacologically active agents indicated in lipid metabolism disorders, groups of pharmacologically active agents indicated in the treatment of angina pectoris. Poisoning with digitalis. Overdose from heparin treatment. Overdose from oral anticoagulant treatment. Heavy metal poisoning. | Lecture, explanation, demonstration, conversation.Exposure with video projector. Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 11. Writing precompounded prescriptions: suppository, vaginal tablet, pessaries. Seminar with concepts from the course: pharmacologically active groups of agents indicated in the treatment of hypotension, in the treatment of hypertension, in the treatment of heart failure. Practical demonstration: demonstration of the diuretic effect of hydrochlorothiazide. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 12. Writing precompounded prescriptions:: solution for injection, powders for preparation of injectable solutions. Recapitulation: writing compounded: and precompounded prescriptions. Seminar with concepts from the course: the choice of antibacterial chemotherapies depending on the ability to cross the physiological barriers, depending on associated diseases. | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 13. Writing precompounded prescriptions: prescribing several drugs on the same prescription. Seminar with concepts from the course: choice of antibacterial chemotherapies according to the antibacterial spectrum (anti-H. Pylori, anti-K. Pneumoniae, anti-S. Aureus, anti-P. Aeruginosa), interactions of imidazole derivatives (antifungal, antiparasitic). | Lecture, explanation, demonstration, conversation.Exposure with video projector. | 2 hours |
| 14. Recapitulation: compounded and precompounded prescriptions. Seminar with concepts from the course: groups of pharmacologically active agents indicated in the treatment of glaucoma. Antacid interactions. Groups of pharmacologically active agents with inhibitory action on the level of the smooth digestive tract. Acute poisoning with corrosive substances. | 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.
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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
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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: Signiture of Didactic Co-ordinator**

**Prof. Dr. Radu Iliescu**

**1.10.2019**

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