

Course Title	Pharmacology II				
Course Code	PHA405				
Course Type	Compulsory				
Level	BSc (Level 1)				
Year / Semester	4 th / 7 th				
Teacher's Name	Dr P. Theodosios-Nompelos, Dr N. Drakoulis				
ECTS	6	Lectures / week	3	Laboratories/week	2
Course Purpose	<p>The purpose of this course is to teach the students the biological, pharmacological and therapeutic effects and usage of drugs. Also, to provide the proper knowledge for the therapeutic application of the drugs concerned. These drugs are mainly directed to the cardiovascular and central nervous systems. Aim is also to study in detail the action of drugs for the treatment of psychic disorders, e.g. antianxiety, neuroleptic and antidepressants drugs and agents against ageing and neurodegenerative conditions. The study of psychotoxic agents, like tetrahydrocannabinol, lysergic acid diethylamide and mescaline, is among the aims of the course, as well as the study of cocaine and other local anaesthetics. Finally, the study of the discovery and establishment of experimental models for various CNS disorders is one of the aims of this course.</p>				
Learning Outcomes	<p>By the end of this course, the students are expected to be able to:</p> <p>Module 1: Cardiovascular system</p> <p>Describe the Anatomy and Physiology of the Cardiovascular System.</p> <p>Analyze the diseases of arrhythmia, arterial hypertension, angina, acute myocardial infarction and heart failure.</p> <p>Describe dyslipidemia as a disease entity.</p> <p>Module 2: Medications that act on the cardiovascular system</p> <p>Explain the pharmacokinetics, mechanism of action, efficacy, side effects, contraindications, toxicity and interactions of drugs that act on the cardiovascular system.</p> <p>Analyze the therapeutic efficacy of cardiological drugs.</p> <p>Module 3: Nervous system</p> <p>Determine the Anatomy and Physiology of the central and peripheral nervous system.</p> <p>Evaluate the function of neurons, the neuronal transmission and the role of</p>				

	<p>neurotransmitters in the nervous system.</p> <p>Get acquainted with neurodegenerative brain diseases such as Parkinson's disease and Alzheimer's senile dementia.</p> <p>Describe the epilepsy entity.</p> <p>Understand the concepts of insomnia, migraine and pain in general</p> <p>Become familiar with the concepts of anxiety, mania and depression</p> <p>Module 4: Medications that affect the nervous system</p> <p>Summarize the pharmacokinetics, mechanism of action, efficacy, side effects, contraindications, toxicity and interactions of drugs acting on the nervous system.</p> <p>Describe the therapeutic utility of neurological drugs as well as those used in psychiatric illnesses.</p> <p>Develop the action of sedatives and stimulants of the central nervous system.</p> <p>Describe analgesics as well as neuroleptics - sedatives, as well as psychotoxic agents</p> <p>Module 5: Drugs that affect the endocrine system</p> <p>Recall the basic principles of the endocrine system (pituitary gland, thyroid, adrenal glands)</p> <p>Analyze vitamins, hormones and drugs that are associated with endocrine disorders.</p> <p>Describe the drugs for obesity.</p>		
Prerequisites	PHA309	Corequisites	None
Course Content	<p>Anatomy of cardiovascular system</p> <p>Cardiovascular physiology.</p> <p>Cardiovascular diseases: arterial hypertension, ischemic heart disease, heart failure, arrhythmias.</p> <p>Cardiovascular disease drugs.</p> <p>Nervous system anatomy, central and peripheral.</p> <p>Central and peripheral nervous system physiology, CNS neurotransmission.</p> <p>Nervous system diseases: epilepsy, neurodegenerative diseases and aging, and pharmaceutical treatment of these diseases.</p> <p>Medicines used in psychiatric diseases such as mania, anxiety, depression.</p>		

	<p>Antidepressants, antidepressants (serotonin reuptake inhibitors, monoamine oxidase inhibitors).</p> <p>Psychotoxic agents, stimulants, tetrahydrocannabinols, cannabis, LSD, cocaine.</p> <p>Neuroleptic - sedative drugs, anesthetics, hypnotics.</p> <p>Opioid analgesics. Centrally acting antitussive drugs.</p> <p>Local anesthetics.</p> <p>Endocrine system, pituitary, thyroid, adrenal glands</p> <p>Vitamins, hormones and medications for related endocrine disorders.</p> <p>Medications for obesity.</p> <p>Laboratory experiments/exercises and case studies: As part of the course, laboratory exercises are carried out on the course material for a better understanding of the theoretical part, aiming at a better understanding of the mechanism of action, the pharmacological actions, the interactions and adverse reactions of drugs. Clinical case studies and analysis of data from research articles are also included.</p> <p>Clinical case studies</p> <ol style="list-style-type: none"> 1. Hypertension and diuretics 2. Heart failure 3. Diabetes and hyperlipidaemia 4. Neurodegenerative diseases 5. Mental Disorders 6. Epilepsy 7. Drug addiction <p>Exercises</p> <p>Exercise 1: In silico study of the potential pharmacological properties and actions of compounds of pharmaceutical interest</p> <p>Exercise 2: Determination of the mechanism of action of diuretics based on the urine volume, pH and the concentration of the urinary solutes</p> <p>Exercise 3: Tyloxapol induced hyperlipidaemia, quantification of LDL, total cholesterol and triglycerides, and determination of the hypolipidaemic activity of known hypolipidaemic agents.</p> <p>Exercise 4: Streptozotocin induced diabetes and quantification of blood glucose and CRP levels. Determination of the activity of anti-diabetic drugs</p> <p>Exercise 5: Determination of the acetyl-cholinesterase inhibitory potency of Physostigmine.</p>
Teaching Methodology	Teaching methodology includes lectures on theoretical background, and exercises to better apprehend the basic concepts of Pharmacology. The lecturer uses PowerPoint presentations with detailed notes in order to help students better understand theory. Methods such as discussion, questions/answers, pros/cons, brainstorming, debates, and cooperative learning are used to enhance the student's participation. Flipped classroom,

	<p>group-based learning and peer-feedback methods will also be implemented. The students have the opportunity to work in teams and discuss their findings with the professor. Recent research results are included and discussed in the course. The laboratory part is conducted in a Pharmaceutical lab with computer support, supervised by the lab instructor/professor. Appropriate preparation and demonstration by the laboratory supervisor precedes each exercise. Assessment of laboratory exercises is done based on laboratory reports submitted by each student at the end of each lab exercise.</p>
<p>Bibliography</p>	<p>Textbook:</p> <ul style="list-style-type: none"> • R. Harvey. Lippincott Pharmacology, 6th edition, Greek Publisher Parisianos, 2015 • R. Harvey. Lippincott Pharmacology, 6th edition, Wolters Kluwer, 2015. <p>References:</p> <ul style="list-style-type: none"> • “Goodman and Gilman's The Pharmacological Basis of Therapeutics”, (13th Edition). Laurence Brunton, Randa Hilal-Dandan, Bjorn Knollmann. McGraw-Hill Education 2017 • «Φαρμακολογία», Rank and Dale, 2^η Ελληνική Έκδοση, Επιστημονικές Εκδόσεις Παρισιάνου Α.Ε, 2014. • «Goodman and Gilman's The Pharmacological Basis of Therapeutics», L. Brunton, B. Chabner, B. Knollman, McGraw-Hill, 12th ed., 2010.
<p>Assessment</p>	<p>Mid Term Exam 20% Lab Reports and case study analysis 20% Final Examination 60%</p> <p>Course evaluation is done by:</p> <p>(a) a written examination during the semester which examines specific modules of the course and it accounts for 20% of the total grade (b) laboratory reports during the semester, in which students present the collected and analysed experimental data as well as their conclusions, derived from theory and the experimental data, and together with case studies analysis account for 20% of the total score (c) a final written examination which examines all modules of the course material and it accounts for 60% of the total grade.</p> <p>Students are prepared for the above written exams over the theoretical and practical background in the classroom and with additional exercises given to them for further practice at home. For the better comprehension of the subject frequent revisions are performed at regular intervals.</p> <p>Questions of gradual difficulty apply to the evaluation of the mid-term and final examination. There may be multiple choice or right/wrong questions with justification of the answers or issue analysis and problem solving questions may be applied in order to evaluate the knowledge and perception of the student on the subject.</p> <p>For the evaluation of laboratory exercise reports, the following criteria shall be taken into account, with ratios varying according to the laboratory exercise:</p> <p>(a) data collection (b) data analysis (c) application of theory to draw conclusions</p>



	The above criteria and assessment tools, as well as their weight, are communicated to the students, and are formulated in such a way in order to maximize the expected learning outcomes as well as the quality of the course.
Language	Greek and English