

Course Title	Clinical Pharmacy and Pharmaceutical Care				
Course Code	PHA413				
Course Type	Compulsory				
Level	BSc (Level 1) / MPharm (Level 2)				
Year / Semester	4 th / 8 th Semester				
Teacher's Name	Dr Panagiotis Theodosios-Nompelos, Dr Nicolaos Drakoulis, Dr Dimitrios Panidis, Dr Maria Papasavva				
ECTS	6	Lectures / week	4+1*	Laboratories/week	1**
Course Purpose	<p>The aim of this course is to provide in-depth knowledge of the concepts of clinical pharmacy and prepare Pharmacy students to be able to assist and collaborate with the medical doctor in the clinical environment, being able to evaluate clinical cases in hospital and community pharmacy. This collaboration concerns dealing with problems of pharmacotherapy, analyzing the therapeutic scheme, advising on drug doses, drug interactions. Another aim is to transfer basic knowledge of pathophysiology and pathobiochemistry of disease and therapeutics, approaches in pharmacotherapy, decision on the appropriate therapeutic scheme and drug doses. Identify a patient's actual and potential drug-related problems and achieve outcomes that improve the patient's quality of life. The importance of various factors like age, sex, body weight, diet, pregnancy, lactation, diabetes, renal or liver dysfunction. Multidrug therapy. Interactions (drug-drug, drug-food). Determination of important pharmacokinetic parameters, and their role for optimal therapeutic effect.</p> <p>*tutorial **practical training</p>				
Learning Outcomes	<p>By the end of this course, the students should be able to:</p> <ul style="list-style-type: none"> • Advise and deal with problems of pharmacotherapy, make decisions concerning therapeutic schemes and doses for a patient, taking into account the safety, and efficacy of drugs, the drug interactions and other factors. • Understand and exploit clinically important drug interactions in a way that aims to minimize unwanted interactions in the therapeutic strategy. • Analyse the importance and dangers of multidrug therapies. • Analyse the role and importance the age, sex, race, body weight, diet, pregnancy, lactation and various disease conditions may have on the treatment approach. • Have in-depth understanding and knowledge about the pathophysiology and treatment of important human diseases, explain symptoms, combine information and suggest or evaluate the given treatment. • Apply the knowledge in order to optimize the patient's health and quality of life with the effective, safe, economic and generally rational use of drugs in patients, during the pharmacy practice. • Determine important pharmacokinetic parameters of drugs (eg C_{max}, $t_{1/2}$, AUC). 				

	<ul style="list-style-type: none"> Recognise the high importance of collaboration between the health professionals in the clinical environment Have acquired experience on the contact with the patient and have understood the specialty of the relationship that is developed during the professional practice. Acquire communication skills and apply strategies for reaching out to patients Critically evaluate scientific findings from relevant literature 		
Prerequisites	PHA309 PHA405	Corequisites	None
Course Content	<p>Theory</p> <p>This course prepares a prospective pharmacist to work in a clinical and community pharmacy environment and collaborate with the medical professionals on problems of pharmacotherapy, setting of therapeutic scheme, drug doses, drug interactions.</p> <ul style="list-style-type: none"> Introduction to Pharmaceutical Care: definition, historical approach to the term, principles of pharmaceutical care. Methods and practices of Pharmaceutical Care. Pharmacokinetics in Clinical Practice and determination of basic pharmacokinetic parameters. Clinically important interactions. Pharmaceutical, pharmacokinetic and pharmacodynamic drug-drug interactions. Drug-food interactions. Phytotherapeutics in the pharmacy practice. Therapeutic drug monitoring and its importance. Examples of drugs. Role of age, sex, race, body weight, diet, pregnancy, lactation and of diabetes, renal, liver and heart diseases. Principles of pathophysiology of diseases and therapeutics. Approaches in pharmacotherapy, decision of the appropriate therapeutic scheme and drug doses. Multi drug therapies. Personalized medicine and Pharmacogenomics for reduction of the adverse drug reactions and optimization of the therapeutic efficacy. Search and analysis of preliminary research and clinical data from reliable databases. Introduction to principles of evidence-based medicine. Study design, research question, evidence sources, synthesis of the results and the risk of bias. Systematic revision and meta-analysis and critical appraisal. General Concepts of Verbal, Nonverbal and Vocal Communications and strategies used by Pharmacist to communicate with patients and health professionals. Interpersonal and written communication, conflict management. <p>Clinical case studies and practical training</p> <p>As part of the course, clinical case studies are analyzed for the strengthening of the theoretical part and for a more practical application of the knowledge acquired during the theory part.</p> <ol style="list-style-type: none"> Introduction to clinical practice (analysis of clinical data and basic calculations) Rheumatoid Arthritis Respiratory diseases [e.g. Chronic Obstructive Pulmonary Disease (COPD)] 		

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| | <ol style="list-style-type: none">4. Duodenal Ulcer5. Angina pectoris and Acute Myocardial Infarction6. Pediatric cases with bacterial and viral infections7. Patients with multiple diseases |
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	<p>During the practical training the student is expected to get involved (under the supervision of the clinical pharmacist) in areas such as:</p> <ul style="list-style-type: none"> • Prescription fulfilling • Communications Skills • Patient interview and history analysis • Patient counseling • Medication Review Intervention
<p>Teaching Methodology</p>	<p>Teaching methodology includes lectures offering the theoretical background for better understanding of concepts in Clinical Pharmacy and Pharmaceutical Care. Detailed notes with PowerPoint are used in the lesson. Material rich in images and short animations are used for the comprehension of some biological processes. Tutorials and case studies are included. Methods such as discussion, questions/answers, pros/cons, brainstorming, role playing, debates and cooperative learning are used to enhance student's preparation. Recent research results are included in the course.</p> <p>The case studies part of the course is conducted applying similar teaching methods together with flipped classroom, group-based learning and peer-feedback methods. The students have the opportunity to work in teams and cooperate in each given case before and during the analysis and discuss their findings with the professor. Each student submits reports for assessment, at the end of each case study.</p> <p>Recent scientific findings presented in selected scientific literature on the subject will be discussed and critically evaluated during the theory and the clinical case studies. Evidence derived from meta-analyses, systematic reviews, and randomized controlled trials will also be included and discussed during the course among with the main principles that lead to the decision-making optimization.</p> <p>The practical training part concerns practice at hospitals and clinics. It concerns 3 visits on 3 different days of practice of at least 4 hours - 5 hours each.</p> <p>During their practice the students will be supervised by clinical experts for potential patient care, communication with patients and interprofessional interaction or ethical issues that may arise.</p>

Bibliography	<p>Textbooks:</p> <ol style="list-style-type: none"> 1. "Clinical Pharmacy and Therapeutics" C. Whittlesea, K. Hodson, 6th Ed., Elsevier, 2018. 2. Κλινική Φαρμακοκινητική. Βασικές αρχές της φαρμακευτικής αγωγής στην κλινική πράξη. Ιωάννης Βιζιριανάκης, Α. Σταμούλη, 2016. 3. Clinical Pharmacology and Therapeutics (Lecture Notes). Gerard A. McKay, John L. Reid, Matthew R. Walters, Greek Publisher, 2014. 4. Κλινική Φαρμακευτική και Θεραπευτική. Ιωάννης Χ. Νιώπας, Λευκοθέα Χ. Παπαδοπούλου. Σταύρος Αντ. Σαρτίνας, 2012. 5. Pharmaceutical Care Practice: The Patient-Centered Approach to Medication Management Services. Robert Cipolle, Linda Strand, Peter Morley, 3rd Ed., McGraw-Hill Education, 2012. 6. Communication Skills in Pharmacy Practice. Robert Beardsley, 7th Ed., Wolters Kluwer, 2019. 7. Meta-analyses, systematic reviews, and randomized controlled trials. <p>References:</p> <ol style="list-style-type: none"> 8. "Clinical Pharmacy and Therapeutics" C. Whittlesea, K. Hodson, 6th Ed., Elsevier, 2018. 9. «Σημειώσεις Κλινικής Φαρμακοκινητικής», Ιωάννης Νιώπας, Τμήμα Εκδόσεων ΑΠΘ, 2010. 10. K. Baxter, Stockley's Drug Interactions Pocket Companion, Pharmaceutical Press, 1st ed., 2010. 11. D.S. Tatro, Drug Interaction Facts, Lippincott Williams & Wilkins; 1st ed., 2010. 12. M. Randall, K. E. Neil, Disease Management: A Guide to Clinical Pharmacology, Pharmaceutical Press, 2009. 13. R. Walker, C. Whittlesea, Clinical Pharmacy and Therapeutics, Churchill Livingstone, 4th ed., 2007.
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Assessment	<ul style="list-style-type: none"> • Mid Term Exam 25% • Case Study Reports 15% • Practical Training participation 10% • Final Examination 50% <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 25% of the total grade</p> <p>(b) reports during the semester with case studies analysis account for 15% of the total score</p> <p>(c) a report of their practical training period which account for 10% of the total grade</p> <p>(d) a final written examination which examines all modules of the course material and it accounts for 50% 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. 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 the case study reports, the following criteria shall be taken into account, with varying ratios:</p> <p>(a) data analysis</p> <p>(b) application of theory to draw conclusions</p> <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.</p>
Language	Greek and English