



UNIVERSITY OF NICOSIA

ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

Course Code PHAR-340	Course Title Pharmaceutical Chemistry III/Φαρμακευτική Χημεία III	Credits (ECTS) 5
Department Life & Health Sciences	Semester Fall	Prerequisites PHAR-150, 151
Type of Course Required	Field Pharmacy	Language of Instruction Greek/English
Level of Course 1 st Cycle	Year of Study 3 rd year	Lecturer Maria Leigh
Mode of Delivery face-to-face	Work Placement N/A	Co-requisites None

Objectives of the Course:

The aim of this course is to teach the students the pharmacology of the vast group of drugs acting on the Central and Peripheral Nervous System and nonsteroidal analgesics, from many points of view: Nomenclature, syntheses, properties, purity control, molecular mode of action, therapeutic uses, fate in the organism, structure-activity relationships. Thus, aims are the knowledge of structure, correlation of structure with drug action, sites of loss, therefore duration of drug action. Another aim is the knowledge of the fate of the drug, i.e. structural changes performed in the body by the drug metabolising enzymes, mainly of the liver. The knowledge of this subject helps considerably other subjects of Pharmaceutical Sciences like Pharmacology, Toxicology, Pharmacotherapeutics

Learning Outcomes:

After completion of the course students are expected to:

- Know the synthesis of the important drug molecules used for pathologic conditions concerning CNS, nonsteroidal analgesics;
- Know the synthesis of the important drug molecules used for pathologic conditions concerning Autonomous Nervous System
- Know the physical and chemical properties of drugs acting on CNS, Autonomous Nervous System and nonsteroidal analgesics and ways to handle them;
- Know the biological properties that give the therapeutic potential to these group of drugs;
- Know characteristic molecules used illegally as narcotic and addictive agents, from the pharmacochemical point of view

Course Contents:

Synthetic strategy, source - receipt, specifying structure analysis, molecular mechanism of action, structure-activity relationships, activity and view pharmacochemical fate in the body of the following drug groups: acetylcholine agonists, inhibitors of acetylcholinesterase, anti -alzheimer, hybrid molecules

antagonists of acetylcholine (the parasympathetic postganglionic endings at neuromuscular synapses in autonomic ganglia), sympathomimetic drugs - agonists alpha and beta receptors, sympatholytic drugs antagonists alpha and beta receptors, nonsteroidal analgesics (inhibitors of lipooxygenase).

Synthetic routes, isolation, physical, chemical, biological properties, quality control and purity, identification, quantification, molecular mechanism of action, secondary action, fate in the body - metabolism -, structure-activity relationships, therapeutic uses, side effects and dosages drugs acting on the central nervous system, i.e. hypnotics, anxiolytics, neuroleptic, antidepressants. Moreover, opioids and other centrally acting analgesics. Opioid antagonists. Introduction to the concept of tolerance. Compounds used in detoxification and addiction treatment. Opioids, cannabinoids, and psychedelic compounds.

Drugs used in Alzheimer's disease Parkinson & of Alzheimer, drugs against migraine.

CNS stimulants, analeptic - Adenosine Agonists/antagonists, adenylyl cyclase inhibitors, PDEs inhibitors, methylphenidate, serine protease inhibitors, statins. Fundamentals correlation structure / activity (SAR). Examples of quantification and chemical identification.

Indicative Laboratory work:

Exercise 1: Synthesis of phenothiazine;

Exercise 2: Synthesis of phenytoin;

Exercise 3: Identification of compounds acting on CNS with Thin Layer Chromatography;

Exercise 4: Detection of S and Cl (ionic or covalently bonded) in chlorpromazine;

Exercise 5: Qualitative and quantitative determination of methanol and ethanol by GLC or HPLC;

Exercise 7: Determination of chlordiazepoxide hydrochloride;

Exercise 8: Identification of unknown drug by infrared spectroscopy.

Learning Activities and Teaching Methods:

Lectures, class discussion, assignments, laboratory

Assessment Methods:

Final Examination, Course work

Required Textbooks/Reading:

T. Lemke	Foyes Principles in Medicinal Chemistry	Wolters Kluwer	T. Lemke	
Graham Patrick	An Introduction to Medicinal Chemistry	Oxford University Press	Graham Patrick	

Recommended Textbooks/Reading:

G.R. Chatwal; M. Arora	Pharmaceutical Chemistry, 2 Organic Medicinal Chemistry	Himalaya Publishers		EBOOK
------------------------	---	---------------------	--	-------

Nadendla, Rama Rao New Age International	Principles of Organic Medicinal Chemistry	New Age		EBOOK