



Course Syllabus

Course Code	Course Title	ECTS Credits
IMPH-241	Medicinal Chemistry II/ Φαρμακευτική Χημεία II	6
Prerequisites	Department	Semester
IMPH-150, IMPH-151	Health Sciences	Fall/Spring
Type of Course	Field	Language of Instruction
Compulsory	Pharmacy	Greek/English
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	Dr Pyrkotis Constantina/Dr Nikolaou Maria/Dr Mirallai Styliana	2 nd
Mode of Delivery	Work Placement	Corequisites
Face-to-Face	N/A	N/A

Course Objectives:

The main objectives of the course are to:

- understand the molecular mechanisms of action of drugs and to educate the future pharmacists in the subject of pharmacology which combines with a targeted manner, chemistry with biology, i.e. the chemical compound with the living system and hence with life itself
- teach the causes of pathologies and the general properties of drug molecules through a pharmacological approach, in particular through explanation of drug design, synthesis, physicochemical properties, interactions with the biological target, structure activity relationships, selectivity, pharmacological potency, fate in the body with the corresponding toxicity and metabolism

Learning Outcomes:

After completion of the course students are expected to be able to:

- Understand for the diversity of drugs that will be addressed
- Explain chemical and physicochemical properties of drug molecules
- Understand relationship of structural features with the action of drug molecules
- Understand the mechanism of action of drug molecules
- Explain on the chemical stability of drug molecules
- Understand the biotransformations

- Explain selectivity
- Describe representative synthetic strategies
- Describe chemical qualitative and quantitative methods of drug molecules
- Understand the modes of interactions with their biological targets, other drugs and contraindications of their use

Course Content:

Synthetic strategy, origin-isolation, structure clarification, analysis, molecular mechanism of action, structure-activity relationships, selectivity, pharmacological activity, fate in the organism and metabolism of the following groups of drugs:

Chemotherapeutic and pharmacodynamic drugs: Antibacterials, antifungals, antivirals, diuretics, agonists of histamine (H1 and H2). Drugs used in diabetes and anti-obesity drugs, drugs that affect the renin-angiotensin system, calcium channel blockers, esters of nitric acid (to treat angina pectoris). Central and peripheral sympatholytics acting on cardiovascular and respiratory systems

Hormones: Classification and examination of chemical, biological and therapeutic aspects. Synthetic analogues of hormones, compounds that inhibit hormonal action. Specifically, pancreatic hormones and insulin analogues, adrenal hormones, thyroid hormones and genital hormones

Laboratory work:

Laboratory 1: Identification and determination of purity with thin layer chromatography

Laboratory 2: Synthesis of sulfanilamide (A, B)

Laboratory 3: Synthesis of sulfanilamide (C)

Laboratory 4 : Determination of sulfanilamide

Laboratory 5: Synthesis of Paracetamol and Synthesis of Hymecromone (until 24h waiting stage)

Laboratory 6 : Synthesis of Hymecromone (completion)

Laboratory 7: Synthesis of dihydropyridine derivative via the Hantzsch method (until 24h waiting stage)

Laboratory 8: Dihydropyridine derivative synthesis (completion) and Synthesis of Diphenylquinoxaline

Laboratory 9: Synthesis of Tetrahydrocarbazole

Learning Activities and Teaching Methods:

Lectures, class discussion, laboratory exercises, examples and tutorials

Assessment Methods:

Final exam, Midterm exam, Lab reports and exam

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Φαρμακευτική Χημεία Ομάδες Χημειοθεραπευτικών και Φαρμακοδυναμικών φαρμάκων	Βασίλης Δημόπουλος	Πήγασος	2009	960-317-063-1
Οργανική Φαρμακευτική Χημεία: Ορμόνες	Αθηνά Γερονικάκη	Μαρκου Ι. Γεωργιος Ε.Ε.	2013	960-8065-56-9
An Introduction to Medicinal Chemistry	Graham Patrick	Oxford University Press	2013	978-0-19-969739-7

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Foye's Principles in Medicinal Chemistry	Thomas L. Lemke, David A. Williams, Victoria F. Roche, William S. Zito	Lippincott Williams & Wilkins Press	2008	978-0-7817-6879-5
Organic, Medicinal and Pharmaceutical Chemistry	J.M. Beale; J.H. Block	Lippincott Williams & Wilkins Press	2011	978-0-7817-7929-6
Pharmaceutical Chemistry Organic, Vol.2	G.R. Chatwal; M. Arora	Himalaya Publishers	2008	EBOOK 978-1-28-280194-3
Textbook of Medicinal Chemistry, Vol.1	V. Alagarsamy	Elsevier	2010	978-81-312-2189-1
Textbook of Medicinal Chemistry, Vol.2	V. Alagarsamy	Elsevier	2010	978-81-312-2190-7

Principles of Organic Medicinal Chemistry	Nadendla, Rama Rao	New Age International	2007	EBOOK
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