UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
IMPH-420	Drug Design and Synthetic Approaches/ Σχεδιασμός Φαρμάκων-Συνθετικές Προσεγγίσεις	4
Prerequisites	**Department**	**Semester**
None	Health Sciences	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Elective	Pharmacy	Greek/English
Level of Course	**Lecturer(s)**	**Year of Study**
1st Cycle	Dr Yiannis Sarigiannis	4th
Mode of Delivery	**Work Placement**	**Corequisites**
Face-to-Face	N/A	N/A

Course Objectives:

This course will provide an in-depth overview of the approaches utilized by medicinal chemists to design novel, pharmacologically active molecules to treat human diseases. Topics covered in the course include the methods for the identification, design, synthesis from the perspective of medicinal chemistry. In addition, during the courses it will be highlighted the current arsenal of methods used in the rational drug design, fragment-based drug discovery and combinatorial chemistry

The main objectives of the course are to:

- evaluate modern methods and approaches of functional group transformations and the application of protecting groups in synthesis design
- develop a critical understanding of the application of retrosynthetic and deconstructive methods to the design of pathways to synthetic drugs
- appreciate the significance of synthetic pathways in relation to regulatory and pharmacopoeias requirements
- be introduced to relevant chemical reactions/synthetic pathways for selected recently approved drugs
- be reflected on green chemistry principles as they explore the drug design and development process.

Learning Outcomes:

The acquired knowledge will help students to prepare better for continuation of their education in health sciences and for jobs in industry.

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

- Assess the traditional and modern methods used for drug discovery from natural and synthetic lead compounds
- Predict a drug's properties based on its structure
- Analyze and evaluate scientific data
- Discuss examples of pharmaceutical drug discovery in detail, and relate patterns and lessons from discovery of these examples
- Describe the current challenges and opportunities in medicinal chemistry in light of contemporary developments in the field of drug discovery
- Design a synthetic route for complex molecular targets

Course Content:

- Receptors as Targets for Drug Design
- Rational Drug Design
- Bioisosteric Replacement
- Fragment – Based Drug Discovery
- Computer Aid Drug Design
- Combinatorial Chemistry
- ProDrug Design and Pharmacokinetics
- Green Chemistry aspects of Drug Synthesis
- Current Challenges in Drug Design and Synthesis
- Synthesis of Peptides and Peptidomimetics
- Organic Process Research & Development

Learning Activities and Teaching Methods:

Lectures, class discussion, research papers and review articles for final pharmaceutical compounds

Assessment Methods:

Final exam, Midterm exam

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Fragment – Based Drug Discovery Lessons and Outlook	Daniel A. Erlanson, Wolfgang Jahnke	Wiley	2016	9783527337750
Top Drugs: Top Synthetic Routes	John Saunders	OUP	2012	9780198501008

Articles from Drug Discovery Today, Nature Reviews Drug Discovery, Bioorganic & Medicinal Chemistry