



UNIVERSITY OF  
**PATRAS**  
ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ

DEPARTMENT OF PHARMACY

SCHOOL OF HEALTH SCIENCES

UNIVERSITY OF PATRAS  
SCHOOL OF HEALTH SCIENCES  
DEPARTMENT OF PHARMACY  
UNDERGRADUATE STUDIES' COURSES



COURSE DESCRIPTION: **MEDICINAL CHEMISTRY III**  
COURSE CODE: **PHA-D25-NEW**

**MEDICINAL CHEMISTRY III  
COURSE DESCRIPTION**

**1. GENERAL**

<b>SCHOOL</b>	HEALTH SCIENCES		
<b>SEPARTMENT</b>	PHARMACY		
<b>LEVEL OF COURSE</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	<b>PHA-D25-NEW</b>	<b>SEMESTER OF STUDIES</b>	<b>8th</b>
<b>COURSE TITLE</b>	MEDICINAL CHEMISTRY III		
<b>INDEPENDENT TEACHING ACTIVITIES</b>	<b>TEACHING HOURS PER WEEK</b>	<b>ECTS CREDITS</b>	
Lectures	5	8	
Tutorias	1		
Laboratory practice	4		
<b>COURSE TYPE</b>	Scientific Field course		
<b>PREREQUISITE COURSES:</b>	-		
<b>TEACHING AND ASSESSMENT LANGUAGE:</b>	Greek		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	Yes [Instructed/Guided self study in english for Erasmus+ Students]		
<b>COURSE WEBPAGE (URL)</b>	<a href="http://www.pharmacy.upatras.gr/images/DS/PHA-D25-EN.pdf">http://www.pharmacy.upatras.gr/images/DS/PHA-D25-EN.pdf</a>		

**2. LEARNING OUTCOMES****Learning Outcomes**

This course aims at acquiring knowledge, skills and competences related to Level 6 of the European Qualifications Framework for Lifelong Learning. In particular, the present course aims to introduce students to the field of Medicinal Chemistry, which is related with the discovery, development, identification and synthesis of new bioactive compounds, the study of their metabolism, the interpretation of their mode of action at the molecular level and the construction of structure-activity relationships.

Upon successful completion of the course:

1. They will have valid knowledge and comprehension of fundamental principles about the discovery and development of new bioactive molecules, which can be used either as therapeutic agents or as chemical biology tools.
2. They will have comprehended how the structural features and physicochemical properties of the new compounds influence their pharmacodynamics and pharmacokinetics.
3. They will have valid knowledge and comprehension of the current approaches applied in the targeted design and discovery of new lead compounds based on the related molecular target information.

4. They will be able to combine and apply the acquired knowledge for solving problems related to molecular design of new candidate bioactive molecules against molecular targets (enzymes, receptors).
5. They will be also able to suggest structural modifications of the new compounds in the context of structure-activity relationship studies for optimizing their pharmacodynamics and pharmacokinetics.
6. They will have valid knowledge and comprehension of the discovery, design, synthesis, metabolism and molecular mode of action of already known therapeutic agents.
7. They will have valid knowledge and comprehension of recent medicinal chemistry research topics, published in relevant textbook and scientific journals.
8. They will have acquired abilities to understand and solve interdisciplinary problems that involve medicinal chemistry issues.
9. They will have developed study skills necessary for their further scientific training and professional development.

#### General Abilities

- Data and information searching, analysis and combination, using the necessary technologies
- Independent work
- Team-work
- Work in an international environment
- Work in an interdisciplinary environment
- Generation of new research ideas

### 3. COURSE CONTENT

#### Lectures-Tutorials

- Alkylating agents as Anticancer Drugs
- Anti-metabolites
- Anticancer Antibiotics
- DNA Crosslinking and Intercalating Antitumor Drugs
- Antimicrobials
- Antiinflammatory drugs
- Antileprosy drugs
- Antifungals
- Antivirals
- Vitamins
- Pathological Avitaminosis - Abuse & Hypervitaminosis
- Drugs against megaloblastic anaemias

#### Laboratory training

- Determination of the oil-water partition coefficient of mandelic acid
- Determination of hydrophobic stable sulfonamides by reversed-phase thin layer chromatography
- Analysis of (RS) -ibuprofen and (S) -ibuprofen by formation of diastereomeric derivatives
- Determination of ascorbic acid
- Determination of the concentration of a sugar solution
- Determination of the salicylic acid concentration in aspirin samples by formation of Fe(III) complexes.

## 4. TEACHING AND LEARNING METHODS - ASSESSMENT

<b>Teaching method</b>	Face to face.	
<b>Use of information and communication technologies</b>	<ul style="list-style-type: none"> <li>Teaching and learning processes are supported by the Upatras e-class platform. The teaching material (lectures, tutorials, laboratory experimental protocols) is uploaded and stored on the e-class and it is freely accessible to all students.</li> <li>Teaching process is supported by Information and Communication Technologies (ICTs).</li> </ul>	
<b>Teaching organization</b>	<b>Teaching Method</b>	<b>Semester Workload</b>
	Lectures	65
	Tutorials	13
	Laboratory work	52
	Unsupervised study	70
	<b>Total number of hours for the Course (25 hours of work-load per ECTS credit)</b>	<b>200</b>
<b>STUDENT ASSESSMENT</b>	Assessment language: Greek Lectures-Tutorials <ul style="list-style-type: none"> <li>Written exams: Multiple choice questions, short answer questions, matching questions and problem solving (70% of the final grade).</li> </ul> Laboratory Course <ul style="list-style-type: none"> <li>Oral and written tests during the laboratory sessions, individual and teamwork laboratory projects and final written exams (multiple choice questions, problem solving) (30% of the final grade).</li> </ul>	

## 5. RECOMMENDED LITERATURE

**Suggested Books:**

- Graham L. Patrick, "An Introduction to Medicinal Chemistry", 5th Edition, Oxford University Press, 2013.
- Thomas L. Lemke, David A. Williams, "Foye's Principles of Medicinal Chemistry", 7th Edition, Lippincott Williams and Wilkins, 2012.
- Richard B. Silverman, "The Organic Chemistry of Drug Design and Drug Action", 3rd Edition Academic Press, 2014.
- Gareth Thomas, "Medicinal Chemistry: An Introduction", 2nd Edition, Wiley, 2008.
- Lecture Notes on Medicinal Chemistry III, by Plato Magriotis & George Pairas, Patras 2019

**Scientific Journals:**

Journal of Medicinal Chemistry  
 ACS Medicinal Chemistry Letters  
 European Journal of Medicinal Chemistry  
 ChemBioChem, ChemMedChem  
 Bioorganic and Medicinal Chemistry  
 Bioorganic and Medicinal Chemistry Letters  
 Angewandte Chemie International Edition  
 Medicinal Research Reviews