



<b>Study program:</b> Integrated Academic Studies in Pharmacy
<b>Course title:</b> Pharmaceutical Chemistry II
<b>Teacher:</b> Nevena N. Grujić-Letić, Emilia I. Gligorić, Branislava D. Teofilović
<b>Course status:</b> compulsory
<b>ECTS Credits:</b> 7
<b>Condition:</b> Pharmaceutical Chemistry I
<p><b>Course aim:</b></p> <p>The aim of this course is to provide students with basic, scientific and academic knowledge and skills in the field of pharmacological active substances of natural, semi-synthetic and synthetic origin. Students learn about the structure, international generic names, branded names of medications, nomenclature and physical-chemical properties of drugs. Special emphasis is given to the association between the chemical structure and effects, as well as to drug biotransformation.</p>
<p><b>Expected outcome of the course:</b></p> <p>Students receive training to understand chemical structures and properties of pharmacological active substances, their metabolism and effects through receptors or some other way. Students are challenged to use their knowledge in research and practice. It is necessary to develop skills in laboratory practice, skills in analyses and preparation of pharmacological active substances, binding gathered practical and theoretical knowledge and their application in pharmacology, pharmaceutical technology and other medical courses.</p>
<p><b>Course description</b></p> <p><i>Theoretical education</i></p> <ol style="list-style-type: none"> <li>Antibacterial antibiotics <ul style="list-style-type: none"> <li>β-lactam antibiotics</li> <li>Aminoglycosides</li> <li>Tetracyclines</li> <li>Macrolides</li> <li>Polypeptides</li> <li>Chloramphenicol</li> </ul> </li> <li>Antiinfectious substances <ul style="list-style-type: none"> <li>Antimycotic antibiotics - Nystatin A<sub>1</sub>, Amphotericin B, Natamycin, Griseofulvin</li> <li>Synthetic antibacterial substances - Quinolones, Nitrofurans and so on.</li> <li>Antituberculous agents</li> <li>Antiprotozoal agents, Anthelmintic agents</li> </ul> </li> <li>Sulfonamides, sulfones, and folate reductase inhibitors</li> <li>Antimalarial agents</li> <li>Antiviral agents</li> <li>Antineoplastic agents</li> <li>Steroids <ul style="list-style-type: none"> <li>steroid hormones (estrogens, androgens, progestins)</li> <li>corticosteroids (mineralocorticoids, glucocorticoids)</li> <li>contraceptive agents</li> <li>anabolics</li> </ul> </li> <li>cardiotonic glycosides Vitamins <ul style="list-style-type: none"> <li>Liposoluble vitamins: A, D, E and K</li> <li>Hydrosoluble vitamins: vitamins of the B group, vitamin C.</li> </ul> </li> </ol> <p><i>Practical education</i></p> <ol style="list-style-type: none"> <li>Introduction to laboratory work.</li> <li>Qualitative analysis of therapeutic substances: theoretical principles, the identification of 25 medicinal substances, elemental analysis, reactions of functional groups, reactions of cations and anions.</li> <li>Drug purity testing: theoretical principles, proving the presence of ammonium ions, arsenic, barium, iron (III), potassium, calcium, nitrate, sulfate, phosphate, chloride, alkaline earth metals, heavy metals, organic ingredients.</li> </ol>

4. Writing 4 monographic publications according to Ph. Jug IV i V: theoretical principles, identification, purity testing, determination by volumetric analysis.
5. Mathematical calculations.

#### Literature

##### Compulsory

1. Wilson E, Gisvold JB. Textbook of Organic Medicinal and Pharmaceutical Chemistry. London: Lippincott Company; 1991.
2. Foye WO, Lemke TL, Williams DA. Principles of Medicinal Chemistry. 4th edn. Baltimor: Williams and Wilkins; 1995.
3. Pharmaceutical Chemistry Laboratory Experiments, Department of Pharmacy, Medical Faculty, University of Novi Sad.

##### Additional

1. Dewick P. Medicinal Natural Products. 2<sup>nd</sup> edn. John Wiley and Sons Ltd; 2002.
2. Nogrady T. Medicinal Chemistry: Biochemical Approach. 2<sup>nd</sup> edn. New York: Oxford University Press; 1988.

**Number of active classes**

**Theoretical classes: 45**

**Practical classes: 60**

**Teaching methods:** interactive lectures with use of video presentations; laboratory practice – individual or in groups; consultations.

**Student activity assessment** (maximally 100 points)

Pre-exam activities	points	Final exam	points
Lectures	5	Written	40
Practices	15	Oral	20
Colloquium	20		
Essay	-		