

<b>Study program:</b> Integrated academic studies of Pharmacy			
<b>Type and level of the study program:</b> integrated academic studies			
<b>Course title:</b> PHARMACEUTICAL CHEMISTRY III (PhIII-PHCHIII)			
<b>Teacher:</b> Nevena N. Grujić-Letić, Emilia I. Gligorić, Branislava D. Teofilović			
<b>Course status:</b> compulsory			
<b>ECTS Credits:</b> 8			
<b>Condition:</b> Pharmaceutical Chemistry II			
<b>Course aim:</b> The aim of this course is to offer students quality theoretical, scientific and academic knowledge and skills about chemical reactions important for qualitative and quantitative chemical analysis of pharmaceutical preparations 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.			
<b>Expected outcome of the course:</b> 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.			
<b>Course description</b>			
<i>Theoretical education</i>			
<ol style="list-style-type: none"> <li>1. Central nervous system depressants: antipsychotics (neuroleptics), tranquilizers (anxiolytics), sedation anesthetics – hypnotics, anticonvulsants (antiepileptics)</li> <li>2. Central nervous system stimulants: tricyclic antidepressants, analeptics, mao inhibitors</li> <li>3. Analgetics: narcoanalgesics (morphine and other substances), analgoantipyretics, antitussives</li> <li>4. Local anesthetics</li> <li>5. Histamine and antihistamines</li> <li>6. Adrenergics and antiadrenergic agents</li> <li>7. Cholinergics and anticholinergics</li> <li>8. Cardiovascular agents: vasodilators, antiarrhythmics, antihypertensive agents, anticoagulation agents, thyroid hormones, antithyroid agents</li> <li>9. diuretics</li> </ol>			
<i>Practical education: exercises, other forms of education, research related activities</i>			
<ol style="list-style-type: none"> <li>1. Getting to know the contents of laboratory work.</li> <li>2. Chromatography: the theoretical principles, thin-layer chromatography (analyzing a mixture of two or three analgesics, analysis of a mixture of methylxanthines, analysis of a mixture of cardiac glycosides), column chromatography: the separation of cardiac glycosides, HPLC: quantitative analysis of preservatives, methylxanthines</li> <li>3. Isolation and purification of caffeine from natural products. Semisynthesis of caffeine. Determination of methylxanthines in food and drink. Determination of the melting point, spectral analysis, a quantitative HPLC analysis.</li> <li>4. Semisynthesis of acetylsalicylic acid. Determination of the melting point, and spectral analysis Titrimetric determination of the content. The purity of the obtained product.</li> <li>5. Setting method for the quantitative determination of a given compound by spectrophotometric method.</li> <li>6. The use of refractometry and polarimetry in the qualitative and quantitative determination of pharmacologically active compounds.</li> <li>7. Mathematical tasks.</li> </ol>			
<b>Literature</b>			
<i>Compulsory</i>			
<ol style="list-style-type: none"> <li>1. Wilson E, Gisvold JB. Textbook of Organic Medicinal and Pharmaceutical Chemistry. Lippincott Company, London, Philadelphia, New York, 1991.</li> <li>2. Foz WO, Lemke TL, Williams DA. Principles of Medicinal Chemistry (4<sup>th</sup> edn). Williams and Wilkins Baltimore, 1995.</li> <li>3. Pharmaceutical Chemistry Laboratory Experiments, Department of Pharmacy, Medical Faculty, University of Novi Sad.</li> </ol>			
<i>Additional</i>			
<ol style="list-style-type: none"> <li>1. Dewick P. Medical Natural products (second edition). John Wiley and sons, Ltd 2002.</li> <li>2. Nogardy T. Medicinal Chemistry: Biochemical Approach (2<sup>nd</sup> edn). Oxford Univ Press. 1988.</li> </ol>			
<b>Number of active classes</b>			Other:
Lectures: 45	Practice: 60	Other types of teaching: Research related activities:	
<b>Teaching methods:</b> interactive lectures and use of video presentations; laboratory practice – individually or in groups; consultations.			
<b>Student activity assessment (maximally 100 points)</b>			
<b>Pre-exam activities</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>
Lectures	5	Written	40
Practices	15	Oral	20
Colloquium	20	.....	
Essay	-		