

Study program: Integrated academic studies of Pharmacy			
Type and level of the study program: integrated academic studies			
Course title: PHARMACEUTICAL TECHNOLOGY II (PhIV-PTECHII)			
Teacher: Mladena N. Lalić-Popović, Veljko S. Krstonošić, Zoran P. Zeković			
Course status: compulsory			
ECTS Credits: 6			
Condition: Pharmaceutical technology I			
Course aim Introduction to basic principles of pharmaceutical technological compounding of different pharmaceutical formulations for the external and internal application like: solution, extracts, suspensions and emulsions.			
Expected outcome of the course: Pharmacy students will acquire knowledge and skills for the compounding of pharmaceutical formulations for external and internal application, solution, extracts, suspensions and emulsions and their quality control, proper packing, labeling and storage.			
Course description <i>Theoretical education</i>		<i>Practical education: exercises, other forms of education, research related activities</i>	
1. Defining of types, role and importance of liquid medicinal forms		1. Compounding of pharmaceutical formulation of solution for internal use of different API concentration	
2. Solutions (definition, classification)		2. Production of pharmaceutical formulation of solution for external use that are common in magistral prescription	
3. Formulation and production of various types of solution		3. Compounding of pharmaceutical formulation of solution used for oral, nasal and auricular therapy	
4. The solvents and substances affecting the solubility		4. Compounding of pharmaceutical formulation of solution for internal use and age appropriate dose adjustment	
5. Liquid pharmaceutical formulations for oral, nasal and auricular therapy		5. Compounding of extractive preparations by maceration according to official regulations	
6. Liquid pharmaceutical formulations and technology for internal and external use		6. Compounding of extractive preparations by infusion according to official regulations	
7. Pharmaceutical testing of solutions for internal and external use		7. Compounding of extractive preparations by decoction according to official regulations	
8. Extractive preparation (definition and types)		8. Compounding of tinctures extractive preparations according to official regulations	
9. Extraction methods according to the official regulations		9. Compounding of tea extractive preparations according to official regulations	
10. Methods for extraction - solvents for extraction		10. Compounding and testing of pharmaceutical suspension formulations for external use	
11. Testing of extractive preparations according to official regulations		11. Compounding and testing of pharmaceutical suspension formulation for internal use	
12. Formulation and production of various types of suspensions		12. Compounding and testing of pharmaceutical emulsion formulations for external use	
13. The stability of suspensions		13. Compounding and testing of pharmaceutical emulsion for internal use	
14. Formulation and production of various types of emulsions			
15. Emulsifiers - types and features			
16. The stability of emulsions			
17. Examination of suspensions and emulsions according to official regulations			
Literature <i>Compulsory</i>			
1. Goločorbin-Kon S, Lalić-Popović M. Practicals in Pharmaceutical Technology: Liquid and Semisolid Preparations. Ortomedics, Novi Sad, 2014.			
2. Troy D, editor. Remington: The Science and Practice of Pharmacy. 21st ed. Lippincott Williams & Wilkins, Philadelphia, 2005.			
3. Allen L, Popovich N, Ansel H, editors. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems. 9th ed. Lippincott Williams & Wilkins, Philadelphia, 2010.			
4. European Pharmacopoeia, 8th ed. European Directorate for the Quality of Medicines & Healthcare (EDQM), Council of Europe, Strasbourg, France, 2013. [e-book]			
5. Sweetman SC, editor. Martindale: The Complete Drug Reference. 36th ed. Pharmaceutical Press, London, 2009. [e-book]			
6. Handouts of lecture presentations			
<i>Additional</i>			
1. Swarbrick J., Boylan J.C., Encyclopedia of Pharmaceutical Technology Marcel Dekker Inc. New York, Basel, 2007			
Number of active classes			Other:
Lectures: 45	Practice: 45	Other types of teaching:	
Research related activities:			
Teaching methods: oral lectures, interactive classes, practical classes, laboratory work			
Student activity assessment (maximally 100 points)			
Pre-exam activities	points	Final exam	points
Lectures	10	Written	50
Practices	10		
Colloquium	30		
Essay			