

Study program: Integrated Academic Studies in Pharmacy
Course title: Pharmaceutical Technology II
Teacher: Mladena N. Lalić-Popović, Zoran Z. Zeković, Dejan Ćirin
Course status: Compulsory
ECTS Credits: 6
Condition: Pharmaceutical Technology I
<p>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.</p>
<p>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.</p>
<p>Course description</p> <p><i>Theoretical education</i></p> <ol style="list-style-type: none"> 1. Defining of types, role and importance of liquid medicinal forms 2. Solutions (definition, classification) 3. Formulation and production of various types of solution 4. The solvents and substances affecting the solubility 5. Liquid pharmaceutical formulations for oral, nasal and auricular therapy 6. Liquid pharmaceutical formulations and technology for internal and external use 7. Pharmaceutical testing of solutions for internal and external use 8. Extractive preparation (definition and types) 9. Extraction methods according to the official regulations 10. Methods for extraction - solvents for extraction 11. Testing of extractive preparations according to official regulations 12. Formulation and production of various types of suspensions 13. The stability of suspensions 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 18. Inhalation preparations (solutions and suspension) <p><i>Practical education</i></p> <ol style="list-style-type: none"> 1. Compounding of pharmaceutical formulation of solution for external use that are common in magistral prescription 2. Compounding of pharmaceutical formulation of solution used for oral, nasal and auricular therapy 3. Compounding of pharmaceutical formulation of solution for internal use and age appropriate dose adjustment 4. Compounding of aqueous extracts according to valid regulations 5. Compounding of alcohol extracts according to valid regulations 6. Compounding and testing of pharmaceutical suspension formulations for external use 7. Compounding and testing of pharmaceutical suspension formulation for internal use 8. Compounding and testing of pharmaceutical emulsion formulations for external use 9. Compounding and testing of pharmaceutical emulsion for internal use
<p>Literature</p> <p><i>Compulsory</i></p> <ol style="list-style-type: none"> 1. Goločorbin-Kon S, Lalić-Popović M. Practicals in Pharmaceutical Technology: Liquid and Semisolid Preparations. Novi Sad: Ortomedics; 2014. 2. European Pharmacopoeia. 10th ed. Strasbourg: European Directorate for the Quality of Medicines & Healthcare (EDQM), Council of Europe; 2020. 3. Aulton M, editor. Aulton's Pharmaceutics – The Design and Manufacture of Medicines. 4th ed. Philadelphia: Elsevier; 2013.

Additional

1. Fahr A. Voigt's Pharmaceutical Technology. Scherphof G, translator. Hoboken, NJ: Wiley; 2018.
2. Allen L, Popovich N, Ansel H, editors. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2010.
3. Allen L, editor. Remington: The Science and Practice of Pharmacy. 22nd ed. London: Pharmaceutical Press; 2012.

Number of active classes	Theoretical classes: 45	Practical classes: 45
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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			