

Study program: Integrated academic studies of Pharmacy			
Type and level of the study program: integrated academic studies			
Course title: PHARMACEUTICAL TECHNOLOGY III (PhV-PTECHIII)			
Teacher: Mladena N. Lalić-Popović			
Course status: compulsory			
ECTS Credits: 5			
Condition: Pharmaceutical technology II			
Course aim Introduction to the basic pharmaceutical and technological principles of production/compounding and testing of different types of semisolid formulations such as ointments, creams, gels and pastes. Introduction to the basic pharmaceutical and technological principles of production/compounding and testing of different sterile pharmaceutical formulations for parenteral and ophthalmic use.			
Expected outcome of the course: Pharmacy students will acquire knowledge on compounding of semisolid formulations such as ointments, creams, gels and pastes, as well as sterile preparations for parenteral and ophthalmic use, their quality control procedures and procedures for proper packaging, labeling and storage.			
Course description <i>Theoretical education</i> 1. Formulation of ointments (composition, types of bases and their selection, methods of preparation, methods of application, packaging and storage) 2. Formulation of creams (composition, types of bases and emulsifiers and their selection, methods of preparation, methods of application, packaging and storage) 3. Formulations of gels and pastes (composition, types of bases and gelling agents and their selection, methods of preparation, methods of application, packaging and storage) 4. Pharmaceutical and technological testing of ointments, creams, gels and pastes according to official regulations 5. Formulation of transdermal therapeutic systems (TTS) 6. Sterilisation, pyrogens (Testing of sterility and pyrogens for sterile pharmaceutical products) 7. Methods of sterilization 8. Isotonicity of sterile pharmaceutical products, isotonicity adjustment methods 9. Parenteral formulations (solvents, active principles, excipients) 10. Injections and intravenous infusions 11. Concentrates for injections or infusions, powders for injections or infusions 12. Solutions for hemodialysis and peritoneal dialysis 13. Pharmaceutical preparations for ophthalmic use (definition, general terms) 14. Pharmaceutical preparations for ophthalmic use (excipients, properties and general requirements) 15. Compounding and testing of pharmaceutical preparations for ophthalmic use 16. Primary packaging of pharmaceutical preparations for parenteral and ophthalmic use (requirements and testing of safety) 17. Immunobiological preparations, vaccines and sera 18. Radiopharmaceutical preparations <i>Practical education: exercises, other forms of education, research related activities</i> 1. Compounding of pharmaceutical formulation of ointments 2. Compounding of pharmaceutical formulation of creams 3. Compounding of pharmaceutical formulations of gels and pastes 4. Compounding of pharmaceutical formulations of sterile preparations (eye drops, injections, infusions) 5. Testing of finished products (ointments, creams, gels, pastes, eye drops, injections and infusions) 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 JC. Encyclopedia of Pharmaceutical Technology Marcel Dekker Inc. New York, Basel, 2007			
Number of active classes			Other:
Lectures: 45	Practice: 60	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			