UNIVERSITY OF NOVI SAD
FACULTY OF MEDICINE

Study program: Integrated Academic Studies in Pharmacy

Course title: Pharmaceutical Technology III

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

Theoretical education

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

Practical education

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

Compulsory

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 Manufacure od 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:** 60

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	60
Practices	10		
Colloquium	20		
Essay			