



**INTEGRATED ACADEMIC
PHARMACY STUDIES**

FOURTH YEAR OF STUDIES

BIOPHARMACY

school year 2023/2024.

Subject:

BIOPHARMACY

The course is evaluated with 5 ECTS. There are 4 hours of active classes per week (2 hours of lectures and 2 hours of work in a small group)

TEACHERS AND ASSOCIATES:

RB	Name and surname	E-mail address	Vocation
1	Jovana Bradić	jovanabradickg@gmail.com	Assistant Professor
2.	Marina Tomovic	marinapop@gmail.com	Full Professor
3.	Anica Petrović	petkovicanica0@gmail.com	Assistant Professor
4.	Marijana Andjic	andjicmarijana10@gmail.com	Teaching Assistant
5.	Marko Simic	simic.marko.kg@gmail.com	Teaching Assistant

COURSE STRUCTURE:

Module	Name of the module	Weeks	Teacher-leader
1	Drug development. Principles of drug absorption. Bioequivalence. Physico-chemical factors affecting drug release and absorption. Oral, buccal and sublingual administration of drugs. Parenteral, ophthalmic and transdermal drug administration: factors affecting release and absorption. Stability of the preparation.	7	Ass. prof Jovana Bradić
2	Nasal, inhalation, rectal and vaginal administration of drugs: factors affecting release and absorption. The role of new therapeutic systems in improving the bioavailability of drugs. Methods for examining the absorption and intestinal permeability of drugs.	8	Ass. prof Jovana Bradić

GRADING SYSTEM:

Student completes the course via modules. Final grade is equivalent to the number of obtained points (see table). The points are obtained in the following way:

PRE-EXAM ACTIVITIES:

ACTIVITY DURING CLASSES: In this way the student can obtain up to 30 points by taking a written test at the end of each module, and, according to knowledge shown, can get 0-15 points for the first module and 0-15 points for the second module.

FINAL EXAM: In this way the student can obtain up to 70 points by taking a test graded according to the table shown.

In order to pass this course, the student must obtain at least 50% of points on each pre-exam activity and also on the final exam. The condition for a student to take the **final exam** is to pass all of the **pre-exam** activities first

MODULE		MAXIMUM POINTS		
		Tests	Final exam	Σ
1	Introduction to cosmetology. Legislation of cosmetic products. Patents. Skin, hair and nails. Formulation, choice of active and auxiliary compounds for the production of various cosmetic products. Cosmeceuticals.	15		
2	Regulations for development, production and storage of cosmetic and medicinal products. Influence of formulation factors and production processes on the stability of drugs and cosmetic products. Stability assaying methods for medications. Pharmaceutical and technological operations and devices used in the pharmaceutical industry.	15		
Σ		30	70	100

The final grade is formed in the following way:

Grading system		
Grade	No. of points	Description
10	91-100	Excellent
9	81-90	Exceptionally good
8	71-80	Very good
7	61-70	Good
6	51-60	Passing

MODULE TESTS AND FINAL EXAM

TEST 1.

TEST
0-15 POINTS

TEST GRADING

The test has 15 questions.
Every question is worth 1 point.

TEST 2.

TEST
0-15 POINTS

TEST GRADING

The test has 15 questions.
Every question is worth 1 point.

FINAL EXAM

TEST
0 – 70 POINTS

TEST GRADING

The test has 70 questions
40 questions are worth 1 point and 15 questions are worth 2 points

LITERATURE:

TITLE OF THE TEXTBOOK	THE AUTHORS	PUBLISHER	THE LIBRARY
Physicochemical Principles of Pharmacy.4th edition.	Florence T, Attwood D	United Kingdom, Pharmaceutical Press, 2006.	Does not have
Pharmaceutical Technology with Biopharmaceutics, Part I	Đurić Z	Shade, Zemun, 2004.	Has
Pharmaceutical medicine	Prostran M, Stanulović M, Marisavljević D, Đurić D	Belgrade, Faculty of Medicine, University of Belgrade, 2009.	Does not have
Reformulation and formulation of medicines. First edition.	Ibrić S, Parojičić J	Belgrade, Faculty of Pharmacy, University of Belgrade, 2012.	Does not have

All lectures are available on the website of the Faculty of Medical Sciences: www.medf.kg.ac.rs

THE PROGRAM:

FIRST MODULE: Drug development. Principles of drug absorption. Bioequivalence. Physico-chemical factors affecting drug release and absorption. Oral, buccal and sublingual administration of drugs. Parenteral, ophthalmic and transdermal drug administration: factors affecting release and absorption. Stability of the preparation.

TEACHING UNIT 1 (FIRST WEEK):

lectures 2 hours	exercises for 3 hours
Drug development. Principles of drug absorption.	Drug development. Principles of drug absorption.

TEACHING UNIT 2 (SECOND WEEK):

lectures 2 hours	exercises for 3 hours
Biological availability i bioequivalence. Biological availability and bioequivalence.	

TEACHING UNIT 3 (THIRD WEEK):

lectures 2 hours	exercises for 3 hours
Physico-chemical factors affecting the release and absorption of drugs. Methods for improving the solubility of poorly soluble drugs	Methods for improving the bioavailability of poorly soluble drugs

UNIT 4 (FOURTH WEEK):

lectures 2 hours	exercises for 3 hours
Oral route of drug administration. Factors influencing the release and absorption of oral dosage forms.	Oral route of drug administration. Factors influencing the release and absorption of oral dosage forms.

UNIT 5 (FIFTH WEEK):

lectures 2 hours	exercises for 3 hours
Buccal and sublingual administration of drugs. Factors affecting the release and absorption of dosage forms for buccal and sublingual administration.	Buccal and sublingual administration of drugs. Factors affecting the release and absorption of dosage forms for buccal and sublingual administration.

UNIT 6 (SIXTH WEEK):

lectures 2 hours	exercises for 3 hours
Parenteral administration of drugs. Factors influencing the release and absorption of medicinal forms for parenteral administration.	Parenteral administration of drugs. Factors influencing the release and absorption of medicinal forms for parenteral administration.

UNIT 7 (SEVENTH WEEK):

lectures 2 hours	exercises for 3 hours
Application of medicines through the skin. Factors affecting the release and absorption of preparations for application to the skin.	Application of medicines through the skin. Factors affecting the release and absorption of preparations for application to the skin.

UNIT 8 (EIGHTH WEEK):

lectures 2 hours	exercises for 3 hours
Methods for improving the delivery of drugs through the skin.	Methods for improving the delivery of drugs through the skin.

UNIT 9 (NINTH WEEK):

lectures 2 hours	exercises for 3 hours
Stability of medicinal forms. Methods for improving stability.	Stability of medicinal forms. Methods for improving stability.

UNIT 10 (TENTH WEEK):

lectures 2 hours	exercises for 3 hours
Ophthalmological application of drugs. Factors affecting the release and absorption of ophthalmic preparations.	Ophthalmological application of drugs. Factors affecting the release and absorption of ophthalmic preparations.

SECOND MODULE: Nasal, inhalation, rectal and vaginal administration of drugs: factors affecting release and absorption. The role of new therapeutic systems in improving the bioavailability of drugs. Methods for examining the absorption and intestinal permeability of drugs.

UNIT 11 (ELEVENTH WEEK):

lectures 2 hours	exercises for 3 hours
Nasal administration of drugs. Factors influencing the release and absorption of nasal preparations.	Nasal administration of drugs. Factors influencing the release and absorption of nasal preparations.

UNIT 12 (Twelfth Week):

lectures 2 hours	exercises for 3 hours
Inhalation administration of drugs. Factors influencing the release and absorption of inhalation preparations.	Inhalation administration of drugs. Factors influencing the release and absorption of inhalation preparations.

UNIT 13 (WEEK THIRTEEN):

lectures 2 hours	exercises for 3 hours
Rectal and vaginal administration of drugs. Factors influencing the release and absorption of rectal and vaginal preparations.	Rectal and vaginal administration of drugs. Factors influencing the release and absorption of rectal and vaginal preparations.

UNIT 14 (FOURTEENTH WEEK):

lectures 2 hours	exercises for 3 hours
The role of new therapeutic systems in improving the bioavailability of drugs.	The role of new therapeutic systems in improving the bioavailability of drugs.

UNIT 15 (FIFTEENTH WEEK):

lectures 2 hours	exercises for 3 hours
Methods for examining the absorption and intestinal permeability of drugs.	Methods for examining the absorption and intestinal permeability of drugs.