



**PHARMACY
INTEGRATED ACADEMIC
STUDIES**

FIFTH YEAR OF STUDY

2024/2025

PHARMACOEPIDEMIOLOGY

Title of the course:

PHARMACOEPIDEMIOLOGY

The course is evaluated with 7 ECTS credits

There are a total of 5 teaching hours per week: 2 hours of lectures, 1 hour of seminar and 2 hours of practice per week

TEACHERS:

	Name and surname	E-mail adress	Title
1.	Radisa Pavlovic	rpavlovic@fmn.kg.ac.rs	Associate professor
2.	Olivera Milovanovic	olivera.milovanovic@fmn.kg.ac.rs	Associate professor
3.	Srdjan Stefanovic	sstefanovic@fmn.kg.ac.rs	Associate professor
4.	Tamara Nikolic Turnic	tamara.nikolic@fmn.kg.ac.rs	Associate professor
5.	Milena Jurisevic	milenajm@yahoo.com	Assistant professor
6.	Aleksandra Stojanovic	vranicaleksandra90@gmail.com	Assistant professor
7.	Natasa Mijailovic	nacakg@gmail.com	Assistant professor
8.	Katarina Mihajlovic	katarina.mihajlovic@fmn.kg.ac.rs	Assistant professor
9.	Marko Ravic	markoravic@hotmail.com	Assistant
10.	Katarina Djordjevic	kacka96kg@gmail.com	Assistant
11.	Bozidar Pindovic	pindovic.bozidar@gmail.com	Assistant

COURSE STRUCTURE:

Teaching takes place through interactive work with students in the form of lectures, practical classes and study research for a total duration of 15 weeks, of which the first 9 weeks of the semester are intended for teaching by thematic units, and the following 6 weeks for consultative teaching in order to plan, prepare and conduct research for the writing of systematic review papers on a given topic. Students are obliged to actively participate in all forms of teaching.

GRADING:

Teaching units form a unique subject module. The grade is equivalent to the number of points earned (see table). Points are earned in two ways:

ACTIVITY DURING CLASSES: The student can earn up to 30 points by analyzing published studies related to the subject of the teaching week. In accordance with the presented knowledge, the student receives from 0 to 2 points per week.

EXAMINATION: The student prepares a final exam essay on a given topic in the field of pharmacoepidemiology. The essay includes an analysis of the most relevant published studies in which pharmacoepidemiological methods were used to explain certain health issues. In this way, a student can earn up to 70 points.

FINAL GRADE:

The final grade, which depends on the total number of earned points - the sum of points on activities during classes and points obtained on the exam, is formed according to the following table:

A TOTAL NUMBER OF EARNED POINTS	FINAL GRADE
0 - 54	5
55 - 64	6
65 - 74	7
75 - 84	8
85 - 94	9
95 - 100	10

ЛИТЕРАТУРА:

1. Strom BL, Kimmel SE, Hennessy S. Pharmacoepidemiology, 6th Edition. New York: John Wiley & Sons, 2019.
2. Hardon A, Hodgkin C, Fresle D. How to investigate the use of medicines by consumers. World Health Organization and University of Amsterdam, 2004.
3. Strom BL, Kimmel SE, eds. Textbook of pharmacoepidemiology. New York: John Willey & Sons, 2006.
4. van Boxtel CJ, Santoso B, Edwards RI. Drug benefits and risks. International Textbook of clinical pharmacology. 1st ed. Chichester: John Wiley and Sons Ltd. 2001.
5. Yang Y, West Srtum D, eds. Understanding pharmacoepidemiology. New York: McGraw Hill Lange, 2011.
6. Радовановић З. Општа епидемиологија, Београд: Наука, 2001

Lecture presentations that will be used in classes are available on the website of the Faculty of Medical Sciences www.medf.kg.ac.rs.

Consultations with teachers will be held every Thursday during the teaching week, from 13:30 to 14:30, in the premises of the Department of Clinical Pharmacy (room 24).

SCHEDULE:

COURSE UNIT 1 (WEEK 1):

INTRODUCTION TO THE PHARMACOEPIDEMIOLGY

Lectures - 2 hours Introduction to pharmacoepidemiology: definitions, history and development. The importance of pharmacoepidemiology for the health care system.	Seminar - 1 hour Pharmacoepidemiology in the academic environment, industry, regulatory bodies and legislation	Practical classes – 2 hours Identification of clinical practice problems that require pharmacoepidemiological research.
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COURSE UNIT 2 (WEEK 2):

TYPES OF PHARMACOEPIDEMIOLOGICAL STUDIES

Lectures - 2 hours Types of pharmacoepidemiological studies. Epidemiological parameters of importance for pharmacoepidemiology.	Seminar - 1 hour Epidemiological studies of the medical devices	Practical classes – 2 hours Analysis of several examples of pharmacoepidemiological studies
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COURSE UNIT 3 (WEEK 3):

CLASSIFICATION OF DRUGS

Lectures - 2 hours Anatomical-therapeutic-chemical classification (ATC classification). The concept of defined daily doses.	Seminar - 1 hour Nomenclature of drugs and other domestic and international drug classification systems	Practical classes – 2 hours Defined daily drug dose (DDD). Finding defined daily doses for drugs that are most commonly used
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COURSE UNIT 4 (WEEK 4):

DRUG UTILISATION STUDIES

Lectures - 2 hours Drug utilization studies. ABC analysis of drug consumption and the concept of "90% of drug consumption".	Seminar - 1 hour Pharmacoepidemiology of medical errors	Practical classes – 2 hours Calculation of drug consumption expressed in defined daily doses.
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COURSE UNIT 5 (WEEK 5):

ANALYSIS OF DRUG UTILISATION TRENDS

Lectures - 2 hours Analysis of secular trends. World Health Organization drug use indicators: basic and additional.	Seminar - 1 hour Evaluation and improvement of drug prescribing practices	Practical classes – 2 hours An analysis of practical examples of studies of the quality of drug prescribing using WHO indicators
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COURSE UNIT 6 (WEEK 6):

Lectures - 2 hours
Case control and cross-over studies: design, applicability and interpretation of results

CASE-CONTROL STUDIES

Seminar - 1 hour
Descriptive case-report and case-series studies: design, applicability and interpretation of results

Practical classes – 2 hours
An analysis of practical examples of case-control studies. An examination of their validity and clinical relevance

COURSE UNIT 7 (WEEK 7):

Lectures - 2 hours
Cohort and cross-sectional studies: design, applicability and interpretation of results

COHORT STUDIES

Seminar - 1 hour
Self-controlled studies: design, applicability and interpretation of results.

Practical classes – 2 hours
An analysis of practical examples of cohort studies. An examination of their validity and clinical relevance

COURSE UNIT 8 (WEEK 8):

SAMPLE IN PHARMACOEPIDEMOLOGICAL STUDIES

Lectures - 2 hours
Selection of the sample and classification of subjects into groups in the research. Method of random selection of respondents and the issue with volunteers

Seminar - 1 hour
Deliberate selection of the population to be investigated.

Practical classes – 2 hours
Determining the sample for different types of research in Pharmacoepidemiology

COURSE UNIT 9 (WEEK 9):

DATA COLLECTION IN PHARMACOEPIDEMOLOGICAL STUDIES

Lectures - 2 hours
Data collection in pharmacoepidemiology and use of secondary sources. Structured and semi-structured questionnaires, interview: problems, correction of results and valid conclusion

Seminar - 1 hour
Spontaneous reporting system, electronic database systems, ad-hoc studies (current and de novo systems)

Practical classes – 2 hours
Analysis of examples of studies using the questionnaire method.

COURSE UNIT 10 (WEEK 10):

Lectures - 2 hours
Planning, research and preparation of a systematic review in the field of pharmacoepidemiology - literature research and writing an introduction

Seminar - 1 hour
Solving practical problems in creating a systematic review in the field of pharmacoepidemiology - literature research and writing an introduction

Practical classes – 2 hours
Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology –literature research and writing an introduction

COURSE UNIT 11 (WEEK 11):

Lectures - 2 hours

Planning, research and preparation of a systematic review in the field of pharmacoepidemiology – methodology

Seminar - 1 hour

Solving practical problems in creating a systematic review in the field of pharmacoepidemiology – methodology

Practical classes – 2 hours

Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – methodology

COURSE UNIT 12 (WEEK 12):

Lectures - 2 hours

Planning, research and preparation of a systematic review in the field of pharmacoepidemiology – results 1

Seminar - 1 hour

Solving practical problems in creating a systematic review in the field of pharmacoepidemiology – results 1

Practical classes – 2 hours

Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – results 1

COURSE UNIT 13 (WEEK 13):

Lectures - 2 hours

Planning, research and preparation of a systematic review in the field of pharmacoepidemiology – results 2

Seminar - 1 hour

Solving practical problems in creating a systematic review in the field of pharmacoepidemiology – results 2

Practical classes – 2 hours

Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – results 2

COURSE UNIT 14 (WEEK 14):

Lectures - 2 hours

Planning, research and preparation of a systematic review in the field of pharmacoepidemiology – discussion and conclusion 1

Seminar - 1 hour

Solving practical problems in creating a systematic review in the field of pharmacoepidemiology – discussion and conclusion 1

Practical classes – 2 hours

Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – discussion and conclusion 1

COURSE UNIT 15 (WEEK 15):

Lectures - 2 hours

Planning, research and preparation of a systematic review in the field of pharmacoepidemiology – discussion and conclusion 2

Seminar - 1 hour

Solving practical problems in creating a systematic review in the field of pharmacoepidemiology – discussion and conclusion 2

Practical classes – 2 hours

Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – discussion and conclusion 2

LECTURES SCHEDULE

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SEMINARES SCHEDULE

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PRACTICE SCHEDULE

SCHEDULE

WEEK	TYPE	TITLE	TEACHER
1	L	Introduction and importance of pharmacoepidemiology	Radisa Pavlovic
	S	Pharmacoepidemiology in different fields	Radisa Pavlovic
	P	Clinical problems	Radisa Pavlovic Katarina Djordjevic Marko Ravic
2	L	Types of pharmacoepidemiological studies and parameters	Srdjan Stefanovic
	S	Epidemiological studies of medical devices	Srdjan Stefanovic
	P	Examples of studies – analysis	Srdjan Stefanovic Aleksandra Stojanovic Bozidar Pindovic
3	L	Drug classifications and defined daily doses	Katarina Mihajlovic
	S	Nomenclature and classification of drugs	Katarina Mihajlovic
	P	Drug consumption expressed in defined daily doses	Katarina Mihajlovic Tamara Nikolic Turnic Bozidar Pindovic
4	L	Drug utilization studies and ABC analysis	Radisa Pavlovic
	S	Pharmacoepidemiology of medical errors	Radisa Pavlovic
	P	Calculation of drug consumption	Radisa Pavlovic Natasa Mijajlovic Bozidar Pindovic
5	L	Analysis of secular trends and WHO indicators	Tamara Nikolic Turnic
	S	Improvement of drug prescribing practices	Tamara Nikolic Turnic
	P	Examples of studies – analysis	Tamara Nikolic Turnic Katarina Djordjevic Marko Ravic

SCHEDULE

Недеља	Тип	Назив методске јединице	Наставник
6	L	Case-control and crossover studies	Srdjan Stefanovic
	S	Descriptive and case series studies	Srdjan Stefanovic
	P	Examples of studies – analysis	Srdjan Stefanovic Bozidar Pindovic Marko Ravic
7	L	Cohort and cross-sectional studies	Aleksandra Stojanovic
	S	Self-control studies	Aleksandra Stojanovic
	P	Examples of studies – analysis	Aleksandra Stojanovic Katarina Mihajlovic Katarina Djordjevic
8	L	Sample selection, classification and randomization	Radisa Pavlovic
	S	Deliberate selection of the population	Radisa Pavlovic
	P	Determining the sample for different types of research	Radisa Pavlovic Katarina Mihajlovic Natasa Mijailovic
9	L	Data collection, questionnaires and interview	Natasa Mijailovic
	S	Spontaneous reporting system, electronic database	Natasa Mijailovic
	P	Examples of studies – analysis	Natasa Mijailovic Aleksandra Stojanovic Katarina Mihajlovic
10	L	Planning, research and preparation of a systematic review in the field of pharmacoepidemiology - literature research and writing an introduction	Radisa Pavlovic
	S	Solving practical problems in creating a systematic review in the field of pharmacoepidemiology - literature research and writing an introduction	Radisa Pavlovic
	P	Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology - literature research and writing an introduction	Radisa Pavlovic Natasa Mijailovic Katarina Djordjevic

SCHEDULE

Недеља	Тип	Назив методске јединице	Наставник
11	L	Planning, research and preparation of a systematic review in the field of pharmacoepidemiology - methodology	Radisa Pavlovic
	S	Solving practical problems in creating a systematic review in the field of pharmacoepidemiology - methodology	Radisa Pavlovic
	P	Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology - methodology	Radisa Pavlovic Tamara Nikolic Turnic Aleksandra Stojanovic
12	L	Planning, research and preparation of a systematic review in the field of pharmacoepidemiology - results 1	Radisa Pavlovic
	S	Solving practical problems in creating a systematic review in the field of pharmacoepidemiology - results 1	Radisa Pavlovic
	P	Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – results 1	Katarina Mihajlovic Bozidar Pindovic Marko Ravic
13	L	Planning, research and preparation of a systematic review in the field of pharmacoepidemiology - results 2	Radisa Pavlovic
	S	Solving practical problems in creating a systematic review in the field of pharmacoepidemiology - results 2	Radisa Pavlovic
	P	Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – results 2	Radisa Pavlovic Aleksandra Stojanovic Marko Ravic
14	L	Planning, research and preparation of a systematic review in the field of pharmacoepidemiology - discussion and conclusion 1	Radisa Pavlovic
	S	Solving practical problems in creating a systematic review in the field of pharmacoepidemiology - discussion and conclusion 1	Radisa Pavlovic
	P	Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – discussion and conclusion 1	Katarina Mihajlovic Natasa Mijailovic Bozidar Pindovic
15	L	Planning, research and preparation of a systematic review in the field of pharmacoepidemiology - discussion and conclusion 2	Radisa Pavlovic
	S	Solving practical problems in creating a systematic review in the field of pharmacoepidemiology - discussion and conclusion 2	Radisa Pavlovic

SCHEDULE

Недеља	Тип	Назив методске јединице	Наставник
	P	Individual research approach and preparation of a systematic review in the field of pharmacoepidemiology – discussion and conclusion 2	Radisa Pavlovic Natasa Mijailovic Katarina Djordjevic
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