STATISTICS IN PHARMACY

PHARMACY
– INEGRATED ACADEMIC STUDIES

FIRST YEAR

2024/2025

Course title:

STATISTICS IN PHARMACY

ECTS: 6
Number of active teaching hours (weekly): 4 (2 lectures teaching classes, 2 practical classes and 1 other active class)

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TEACHERS AND ASSOCIATES:

No.	First name and surname	Email	Academic title
2.	Vladislava Stojić	vladislavastojic@fmn.kg.ac.rs	Assistant Professor
3.	Jelena Dimitrijević	jelena.dimitrijevic@fmn.kg.ac.rs	Teaching Assistant
4.	Sara Mijailović	sara.mijailovic@fmn.kg.ac.rs	Teaching Assistant
5.	Anđela Gogić	andjela.gogic@fmn.kg.ac.rs	Facilitator

COURSE STRUCTURE:

Module	**Name of the course module**	**Weeks**	**Teaching Lectures (weekly)**	**Practice (weekly)**	**OAC**	**Teacher – in charge**
1.	**Informatics**	7	2	2	1	Asst. Prof. Vladislava Stojić
2.	**Statistics**	8	2	2	1	Asst. Prof. Vladislava Stojić
						Σ 30+15+30=75

Examination Methods:

The student finishes the course in modules. The grade is equivalent to the number of points earned (see tables). Points are earned in two ways:

ACTIVITY DURING THE LESSON: The student can gain up to 30 points, by answering ten written questions from that week's lesson in a special part of the exercise and receiving 0-2 points in accordance with the demonstrated knowledge.

FINAL TESTS BY MODULES: The student can gain up to 70 points according to the attached table.

Determination of final grade		The maximal number of points		
		Activity during the lesson	Final test	Σ
1	Informatics	14	30	44
2	Statistics	16	40	56
Σ		30	70	100

Determination of final grade:

To pass the exam, the student must earn a minimum of 51 total points and pass all modules. To pass the module student must:
1. earn more than 50% points in that module
2. earn more than 50% points for the activity during the lesson in each module
3. pass the module test by having more than 50% correct answers.

Grading system

Final grade	**Total number of points Points grade**	**Description**
10	91 – 100	**Excellent**
9	81 – 90	**Exceptionally good**
8	71 – 80	**Very good**
7	61 – 70	**Good**
6	51 – 60	**Passing**
5	< 51	**Falling**

LITERATURE:

Module	The title of the textbook	Authors	Publisher	Library of faculty
1 and 2	Discovering statistics using SPSS.	Field A.	London: Sage, 2009.	
	Inventive biostatistics	Motulsky H.	New York: Oxford University Press, 2010	
	Pharmaceutical Statistics.	Joanes D.	London: Pharmaceutical Press, 2005.	
	Common errors in statistics and how to avoid them.	Good P.	New York: John Wiley & Sons, 2009.	

Program of lectures and practical classes:

THE FIRST MODULE: INFORMATICS

TEACHING UNIT 1 (WEEK 1):

WINDOWS	
Teaching lectures (2 classes)	Practical classes (2 classes)
Basics of the Windows operating system.	Installing and setting up the Windows operating system.
OAC (1 class)	
Characteristics of the Windows operating system.	

TEACHING UNIT 2 (WEEK 2):

WINDOWS	
Teaching lectures (2 classes)	Practical classes (2 classes)
Basics of the Windows operating system.	Working in the Windows operating system
OAC (1 class)	
Working with files and folders.	

TEACHING UNIT 3 (WEEK 3):

MICROSOFT WORD	
Teaching lectures (2 classes)	Practical classes (2 classes)
Word processors.	Formatting text, inserting images and tables in Microsoft Word.
OAC (1 class)	
Characteristics of Microsoft Word.	

TEACHING UNIT 4 (WEEK 4):

MICROSOFT EXCEL	
Teaching lectures (2 classes)	Practical classes (2 classes)
Spreadsheet program.	Creating and formatting tables, using basic functions in Microsoft Excel.
OAC (1 class)	
Characteristics of Microsoft Excel.	

TEACHING UNIT 5 (WEEK 5):

MICROSOFT POWERPOINT	
Teaching lectures (2 classes)	Practical classes (2 classes)
Program for creating presentations.	Creating and formatting slides, and inserting images and tables in Microsoft PowerPoint.
OAC (1 class)	
Characteristics of Microsoft PowerPoint.	

TEACHING UNIT 6 (WEEK 6):

INTERNET	
Teaching lectures (2 classes)	Practical classes (2 classes)
Web. Email and security. Viruses. OAC (1 class) Basics protection on the Internet.	Internet browsing, Internet protection, e-mail account opening, Internet communication.

TEACHING UNIT 7 (WEEK 7):

MEDICAL DATABASES	
Teaching lectures (2 classes)	Practical classes (2 classes)
Overview of databases. PubMed. Medical journals on the Internet. OAC (1 class) Medical databases and medical journals.	Browsing medical databases and medical journals on the Internet. Downloading publications from the Internet.

THE SECOND MODULE: STATISTICS

TEACHING UNIT 8 (WEEK 8):

FREQUENCY DISTRIBUTIONS	
Teaching lectures (2 classes)	Practical classes (2 classes)
Types of data. Frequency distributions. Histograms and other frequency charts. Forms of frequency distribution. Medians and quantiles. Mean. Variance, range and interquartile range. Standard deviation OAC (1 class) Descriptive statistics.	The SPSS program. Basic settings. Creating a data file and entering data. Types of variables. Frequency. Median. Mean. Variance. Standard deviation.

TEACHING UNIT 9 (WEEK 9):

PROBABILITY	
Teaching lectures (2 classes)	Practical classes (2 classes)
Ratio and proportion. Significant figures. Presentation of tables. Charts. Properties of probability. Probability distribution and random variables. Binomial distribution. Mean and variance. OAC (1 class) Tables and diagrams.	Working in SPSS. Tables. Importing tables into Word documents. Histogram. Bar chart. Line diagram. Scatter diagram. Importing diagrams into Word documents.

TEACHING UNIT 10 (WEEK 10):

NORMAL DISTRIBUTION

Teaching lectures (2 classes)	Practical classes (2 classes)
Normal distribution. Variables that follow a Normal distribution. Normal chart.	Solving problems related to Normal distribution. Normal distribution diagram.
OAC (1 class)	
Normal distribution.	

TEACHING UNIT 11 (WEEK 11):

PREDICTION

Teaching lectures (2 classes)	Practical classes (2 classes)
Sample distributions. Standard error of the sample mean. Confidence intervals. Standard error and confidence interval for a proportion. Comparing two proportions.	Solving problems related to comparing two proportions in the SPSS program.
OAC (1 class)	
A comparison of two proportions.	

TEACHING UNIT 12 (WEEK 12):

HYPOTHESIS TESTING

Teaching lectures (2 classes)	Practical classes (2 classes)
Hypothesis testing. Sign test. Principles of significance tests. Significance levels and error types. One-sided and two-sided tests of significance.	Solving problems related to hypothesis testing in the SPSS program.
OAC (1 class)	
Hypothesis testing.	

TEACHING UNIT 13 (WEEK 13):

COMPARISON OF THE MEANS OF A SMALL SAMPLE

Teaching lectures (2 classes)	Practical classes (2 classes)
t distribution. t one-sample method. Use of transformations. Deviations from the assumptions of the t method.	Solving problems related to student's t distribution in the SPSS program.
OAC (1 class)	
Student's t distribution.	

TEACHING UNIT 14 (WEEK 14):

HYPOTHESIS TESTING

Teaching lectures (2 classes)	Practical classes (2 classes)
Scatter diagrams. Regression. The method of least squares. Correlation. Test significance and confidence interval for r. Using the correlation coefficient	Solving problems related to regression and correlation in the SPSS program.
OAC (1 class)	
Regression and correlation.	

TEACHING UNIT 15 (WEEK 15):

NON-PARAMETRIC METHODS	
Teaching lectures (2 classes)	Practical classes (2 classes)
Non-parametric methods. Mann-Whitney U test. Wilcoxon test. Spearman's rank correlation coefficient. Chi-square test.	Solving problems related to non-parametric methods in the SPSS program. Mann-Whitney U test. Wilcoxon test. Chi-square test.
OAC (1 class)	
Non-parametric methods.	

Schedule of lectures & practice

TUESDAY
14.30-18.30 Hall at the pediatric clinic

LECTURES AND PRACTICAL CLASSES

week	type	Teaching and practice lectures	Teacher
1	**L**	**WINDOWS**	Asst. Prof Vladislava Stojić
	P	**WINDOWS**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**WINDOWS**	Asst. Prof Vladislava Stojić
2	**L**	**WINDOWS**	Asst. Prof Vladislava Stojić
	P	**WINDOWS**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**WINDOWS**	Asst. Prof Vladislava Stojić
3	**L**	**MICROSOFT WORD**	Asst. Prof Vladislava Stojić
	P	**MICROSOFT WORD**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**MICROSOFT WORD**	Asst. Prof Vladislava Stojić
4	**L**	**MICROSOFT EXCEL**	Asst. Prof Vladislava Stojić
	P	**MICROSOFT EXCEL**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**MICROSOFT EXCEL**	Asst. Prof Vladislava Stojić
5	**L**	**MICROSOFT POWER POINT**	Asst. Prof Vladislava Stojić
	P	**MICROSOFT POWER POINT**	Jelena Dimitrijević Sara Mijailović Anđela Gogić

LECTURES AND PRACTICAL CLASSES

week	type	Teaching and practice lectures	Teacher
	OAC	**MICROSOFT POWER POINT**	Asst. Prof Vladislava Stojić
6	**L**	**INTERNET**	Asst. Prof Vladislava Stojić
	P	**INTERNET**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**INTERNET**	Asst. Prof Vladislava Stojić
7	**L**	**MEDICAL DATABASES**	Asst. Prof Vladislava Stojić
	P	**MEDICAL DATABASES**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**MEDICAL DATABASES**	Asst. Prof Vladislava Stojić
8	**L**	**FREQUENCY DISTRIBUTIONS**	Asst. Prof Vladislava Stojić
	P	**FREQUENCY DISTRIBUTIONS**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**FREQUENCY DISTRIBUTIONS**	Asst. Prof Vladislava Stojić
9	**L**	**PROBABILITY**	Asst. Prof Vladislava Stojić
	P	**PROBABILITY**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**PROBABILITY**	Asst. Prof Vladislava Stojić
10	**L**	**NORMAL DISTRIBUTION**	Asst. Prof Vladislava Stojić

LECTURES AND PRACTICAL CLASSES

week	type	Teaching and practice lectures	Teacher
	P	**NORMAL DISTRIBUTION**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**NORMAL DISTRIBUTION**	Asst. Prof Vladislava Stojić
11	**L**	**PREDICTION**	Asst. Prof Vladislava Stojić
	P	**PREDICTION**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**PREDICTION**	Asst. Prof Vladislava Stojić
12	**L**	**HYPOTHESIS TESTING**	Asst. Prof Vladislava Stojić
	P	**HYPOTHESIS TESTING**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**HYPOTHESIS TESTING**	Asst. Prof Vladislava Stojić
13	**L**	**COMPARISON OF THE MEANS OF A SMALL SAMPLE**	Asst. Prof Vladislava Stojić
	P	**COMPARISON OF THE MEANS OF A SMALL SAMPLE**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**COMPARISON OF THE MEANS OF A SMALL SAMPLE**	Asst. Prof Vladislava Stojić
14	**L**	**HYPOTHESIS TESTING**	Asst. Prof Vladislava Stojić
	P	**HYPOTHESIS TESTING**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**HYPOTHESIS TESTING**	Asst. Prof Vladislava Stojić

LECTURES AND PRACTICAL CLASSES

week	type	Teaching and practice lectures	Teacher
15	**L**	**NON-PARAMETRIC METHODS**	Asst. Prof Vladislava Stojić
	P	**NON-PARAMETRIC METHODS**	Jelena Dimitrijević Sara Mijailović Anđela Gogić
	OAC	**NON-PARAMETRIC METHODS**	Asst. Prof Vladislava Stojić