SYLLABUS
Spring semester 2023-2024 a.y.
Learning program "6B10102 Pharmacy"

ID and title of course	Student independent work (SIW)	Credits number			Total number of credits	Student independent work under teacher supervision (SIWT)
		Lecture (L)	Classes (C)	Laboratory classes (L)		
91275 Statistics in Pharmacy	4	-	60	-	4	6

АКАДЕМИЧЕСКАЯ ИНФОРМАЦИЯ О ДИСЦИПЛИНЕ

Training format	Cycle, component	Type of lectures	Type of classes	Form and platform of final control
offline	B, BK	-	Seminars	Testing in Moodle
Lecturer	Farida Iskakova			
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Assistant	-			
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ACADEMIC PRESENTATION OF DISCIPLINE

Purpose of discipline	Expected Learning Outcomes (ELOs)*	Indicators of ELO's achievement (IA)
to form in students ability of systematic presentation and understanding of statistics as a science, the role of statistics in medicine and public health	1. Explain the objectives of medical statistics and its main directions, laws, and basic definitions of statistical theory statistics, methods, algorithms, and tools of statistical analysis.	1.1 Distinguishes between types of variables
		1.2 Performs descriptive statistics on research data
	2. Possess the skills to apply scientific knowledge of the theory and practice of statistical analysis.	2.1 Identifies appropriate comparison groups for epidemiologic studies.
		2.2 Distinguishes between methods of descriptive and statistical analysis depending on types of variables and samples.
	3. To conduct independently the organization and statistical processing of the database of scientific research results.	3.1 Creates a database layout (structure) in MS Excel program in accordance with the logic of the research being conducted 3.1. according to the logic of the research being conducted.
		3.2 Apply indicators of descriptive statistics according to the types of variables.
	4. Conduct statistical analysis of scientific research results.	4.1. Uses statistical tools in the selection of statistical procedures. 4.1. Formulates statistical hypotheses.
		4.2 Determines the statistical significance of relationships and differences for all types of variables by applying the appropriate statistical criterion.
	5. To make an analysis of statistical research based on quantitative methods and new information technologies.	5.1 Present results in the form of graphs and tables.
		5.2 Analyzes the obtained analyzes the results of statistical processing.
Prerequisites	Biostatistics [96313]	
Post-requisites	Fundamentals of public health research [101986]	
Learning sources	**Literature:**	

	The main 1. Aviva Petrie, Caroline Sabin. Visual medical statistics. Textbook for universities. Moscow, GEOTAR-Media, 2015. 168 c. 2. Nasledov A. N31 IBM S P S S Statistics 20 and AMOS: professional statistical analysis of data. - SPb.: Peter, 2013. 416c. 3. Elizabeth De Poy, Laura N. Gitlin; per. from Engl. ed. by V.V. Vlasov. Vlasov. Methods of scientific research in medicine and public health - M.: GEOTAR-Media, 2017. - 432 c. 4. Koichubekov, M. A. Sorokina, A. S. Bukeeva [et al] ; KSMU. Biostatistics in examples and tasks : textbook for universities / B. K.- Almaty : Evero, 2016. 5. Koichubekov B.K. Biostatistics : textbook. -Evero, 2015. THE ADDITIONAL 6. Grzhibovsky A.M., Ivanov S.V., Gorbatova M.A. Descriptive statistics using the packages of Statistica and SPSS statistical programs: distribution verification // Science and Health. 2016. № 1. C. 7- 23. 7. Grzhibovsky A.M., Ivanov S.V., Gorbatova M.A. Comparison of quantitative data of two independent samples using Statistica and SPSS software: parametric and nonparametric criteria // Science and Health. 2016. № 2. C. 5-28. 8. Grzhibovsky A.M., Ivanov S.V., Gorbatova M.A. Comparison of quantitative data of two paired samples using Statistica and SPSS software: parametric and nonparametric criteria // Science and Health. 2016. № 3. C. 5-25. 9. Grzhibovsky A.M., Ivanov S.V., Gorbatova M.A. Comparison of quantitative data of three and more independent samples using Statistica and SPSS software: parametric and nonparametric criteria// Science and Health Care. 2016. № 4. C. 5-37. 10. Grzhibovsky A.M., Ivanov S.V., Gorbatova M.A. Comparison of quantitative data of three and more paired samples using Statistica and SPSS software: parametric and nonparametric criteria // Science and Health. 2016. № 5. C. 5-29. **Research infrastructure** **1. Computer lab 6A** Professional research databases www.gapminder.com www.cdc.gov **Internet sources** **http://elibrary.kaznu.kz/ru** **https://www.stat.gov.kz/** **Software** excel spss

Academic policy disciplines	Academic policy of the discipline is defined by the Academic Policy and Academic Integrity Policy of Al-Farabi KazNU. The documents are available on the main page of IS Univer. Integration of science and education. Research work of students, masters and doctoral students is a deepening of the educational process. It is organized directly at the departments, laboratories, scientific and project divisions of the university, in student scientific and technical associations. Independent work of students at all levels of education is aimed at the development of research skills and competencies on the basis of obtaining new knowledge using modern research and information technologies. The teacher of the research university integrates the results of scientific activity into the topics of lectures and seminars (practical) classes, laboratory classes and in the assignments of SROP, SROP, which are reflected in the syllabus and are responsible for the relevance of the topics of training sessions and assignments. Attendance. The deadline for each assignment is specified in the calendar (schedule) of the implementation of the content of the discipline. Failure to meet deadlines will result in loss of points. All learners, especially those with disabilities, can receive counseling assistance by telephone / e-mail +77011013086/farida.iskakova@kaznu.kz or by join Zoom Meeting https://us04web.zoom.us/j/77801302391?pwd=c0I5647lwe4woqZ5EJPBCNJJ42masY.1 Meeting ID: 778 0130 2391 Passcode: 7ZaZwz Integration of MEP (massive open online course). In case of integration of MEP into the discipline, all students need to register for MEP. The deadlines for MEP modules must be strictly adhered to in accordance with the schedule of the discipline. ATTENTION: The deadline for each assignment is specified in the calendar (schedule) of the implementation of the content of the discipline, as well as in the MEP. Failure to comply with deadlines leads to loss of points.
INFORMATION ON TEACHING, LEARNING AND ASSESSMENT	

Point-rating letter system of evaluation of learning achievements				Assessment methods	
Scores	**Digital equivalent of points**	**scores, % contentсодержание**	Traditional scores	Criterion-referenced assessment is the process of correlating actual learning outcomes with expected learning outcomes based on clearly defined criteria. It is based on formative and summative assessment. Formative assessment is a type of assessment that is carried out in the course of daily learning activities. It is a current indicator of learning achievement. Provides an operational relationship between the student and the teacher. It allows us to determine the capabilities of the student, to identify difficulties, to help in achieving the best results, and to correct the educational process of the teacher in a timely manner. Evaluate the fulfillment of tasks and activities in the classroom during lectures, seminars, and practical classes (discussions, quizzes, debates, round tables, laboratory work, etc.). acquired knowledge and competencies are assessed. Summative assessment is a type of assessment, which is conducted at the end of the study of a section in accordance with the program of the discipline. It is carried out 3-4 times per semester when performing SLOs. It is an assessment of mastering the expected learning outcomes in correlation with descriptors. Allows you to determine and record the level of mastering of the discipline for a certain period.	
A	4,0	95–100	Excellent	**Formative and summative assessment**	**Formative and summative assessment**
A-	3,67	90–94			
B+	3,33	85–89	Good		
B	3,0	80–84			
B-	2,67	75–79		Formative and summative assessment	-
C+	2,33	70–74		Activity in lectures	40
C	2,0	65–69	Satisfied	Work at practical classes	50
C-	1,67	60–64		Independent work	10
D+	1,33	55–59		Control work	60
D	1,0	50–54		Project and creative activity	40
FX	0,5	25–49	unsatisfied	TOTAL	100
F	0	0			-

Schedule of the realization of the content of the discipline. Methods of teaching and learning

Week	Topic	N of hours	Max. scores
	MODULE 1 Fundamentals of medical statistics		
1	Cl. 1. Subject matter of medical statistics. Types of population. Sampling population. Basic requirements for sampling. Software for data analysis and processing. Application of MS. Excel in medical statistics. Construction of formulas. Statistical functions. Logical function "If".	4	4
2	Cl. 2. Variation series. Construction of a variational series. Sturges formula. Performing basic operations on data in SPSS. Data selection. Data transformation. Calculating new variables.	4	6
3	Cl. 3. Mean. Weighted arithmetic mean. Moda. Median.	4	6
	SIWT 1. Consultations on the implementation of SIW1	3,33	-
4	Cl. 4. The concept of variability in statistical analysis. Calculation of standard deviation.	4	6
	SIW1. "Calculating parameters of descriptive statistics".	10	25
5	Cl. 5. Nature of distribution option. Normal distribution. Characterization of population units. Descriptive statistics.Software for data analysis and processing. Application of Ms Excel in medical statistics. Analysis package. Statistical criteria for testing distributions in SPSS.	4	6
	SIWT 2. Colloquium (Test).	3,33	-
	MODULE 2 Statistical methods of data processing.		
6	Cl. 6. Parametric criteria for assessing the reliability of differences between repeated measurements. Algorithm of application of paired Student's t-criterion. Parametric tests in SPSS. Comparisons of dependent groups.	4	6
	SRMP 3. Consultation on the implementation of the SRMP 2.	3,33	10
7	Cl. 7. Parametric criteria for assessing the reliability of differences between two independent samples. Algorithm of application of Student's t-criterion. Parametric tests in SPSS. Comparisons of independent groups.	4	6
	SIW 2. "Solving a problem on the application of Student's paired t-criterion"	10	25
MT 1			100
8	Cl. 8. Analysis of qualitative features. Conjugacy tables: $\chi 2$ test. Fisher's exact test. Statistical criteria for conjugacy tables in SPSS.	4	5

	SIWT 4. Consultation on the implementation of the SIW 3.	3,33	-
9	Cl. 9. Nonparametric methods for assessing the reliability of two dependent and independent samples. Signs criterion. Algorithm of application Wilcoxon's T-criterion. Rosenbaum's Q-criterion. Algorithm of application of Mann-Whitney U-Test. Non-parametric tests in SPSS.	4	5
	SIW 3. "Solving a problem on the application of the $\chi 2$ criterion".	10	25
10	Cl. 10. Analysis of dynamic series. The main indicators of the dynamic series.	4	5
11	Cl. 11. Methods of equalization of dynamic series. Determination of seasonality indices.	4	5
12	Cl. 12. Determination of dependence and relationship between phenomena. Pearson's correlation coefficient. Spearman's rank correlation coefficient. Linear regression analysis.	4	5
	SIWT 5. Consultation on the implementation of the SIW 4.	3,33	-
13	Cl. 13. Key demographic indicators.	4	5
	SIWT 6. Colloquium (Test).	3,33	10
14	Cl. 14. Construction of survival curve using the Kaplan-Meier method	4	5
15	Cl. 15. International Classification of Diseases.	4	5
	SIW 4"Solving a problem to determine the relationship".	10	25
MT 2			100
Final exam			100
Total			100

Dean _____ **R.B.Issayeva**

Head of department _____ **A.E.Ualiyeva**

Lecturee _____ **Iskakova F.A.**

RUBRICATOR OF THE SUMMATIVE ASSESSMENT CRITERIA

EVALUATION OF LEARNING OUTCOMES

Task name (points, % content from 100% MC, copy from the calendar (graphics) implementation of the content of the training course, methods of teaching and learning

Criterion	**"Excellent" Max. weight in %**	**"Good" Max. weight in %**	**"Satisfactory" Max. weight in %**	**"Unsatisfactory" Max. weight in %**
	95- 100 %	80-94%	64-79%	<63%

№	**Criterion (point-rating assessment)**	**25-30%**	**20-20%**	**15-20%**	**0-15%**
		perfect	***good***	***satisfied***	***unsatisfied***
1	Explain the objectives of medical statistics and its main directions, laws, and basic definitions of statistical theory statistics, methods, algorithms, and statistical analysis tools.	In-depth knowledge of statistics and statistical analysis tools; in research design. Demonstrated original thinking. Independently used additional literature. Use descriptive and inferential statistics in research. Good at academic writing.	Good knowledge of statistics and statistical analysis. Demonstrated standard thinking and use of descriptive and inferential statistics. Good at academic writing.	Knows the basis of statistics and statistical analysis. Demonstrated standard thinking. Use descriptive statistics. Good at academic writing.	Low level of knowledge in statistics and statistical analysis. Demonstrated low reasoning. Understanding his mistakes and willingness to correct them. Not good at academic writing.
2	Knowledge of research design in Epidemiology.				
3	Possess the skills to apply scientific knowledge of the theory and practice of statistical analysis.				
4	Knowledge of searching and critically analyzing publications.				
5	To independently organize and statistically process the database of scientific research results.				
6	Knowledge and skills in descriptive and inferential methods of Biostatistics.				
7	Conduct statistical analysis of scientific research results.				

Point-rating assessment of the student's independent work under the guidance of a teacher (maximum, 50 points)

№	Evaluation criteria	10 points	8 points	6 points	4 points
1.	Completeness and accuracy.	Completes the assignment completely. Applies critical thinking and analysis skills in completing the assignment. Effective presentation of data.	Completes the task with some inaccuracies. Shows standardized thinking and reasoningю. Applies analysis skills. Good presentation of data.	Completion of the task with significant errors. Understands his/her mistakes and is ready to correct them. Weak analysis skills.	Failure to complete the assignment. Does not show scientific thinking and practical skills. Weak skills in analyzing and presenting the assignment.
2.	Critical thinking				
3.	Analytical skills				
4	Presentation of the assignment				