



ОҢТҮСТІК-ҚАЗАҚСТАН <b>MEDISINA</b> <b>AKADEMIASY</b> «Оңтүстік Қазақстан медицина академиясы» АҚ	 <b>SKMA</b> -1979-	SOUTH KAZAKHSTAN <b>MEDICAL</b> <b>ACADEMY</b> АО «Южно-Казakhstanская медицинская академия»
Department: "Medical Biophysics and Information Technologies" Control and measuring tools for the course "Biostatistics"		№ 35-11(Б)-2024 p.1 out of 4

## CONTROL AND MEASURING DEVICES

### Questions of the program for border control 1

<b>Course:</b>	Introduction to Scientific Research
<b>Course code de</b>	ISR 2212
<b>Educational program:</b>	6B10115 «Medicine»
<b>Number of academic hours/credits:</b>	180/6
<b>Year/Term:</b>	2/4


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Protocol no. 11 from "30" 05 2024 y.



1. The subject and objectives of biostatistics.
2. The general population and the sample.
3. Types of measuring scales.
4. Nominal and ordinal data.
5. Types of data collected in healthcare.
6. Spreadsheets as a type of application software.
7. Advantages of using spreadsheets.
8. System requirements for the STATISTICA program.
9. The menu bar in the STATISTICA program.
10. Types of documents in the STATISTICA program. Extensions of these documents.
11. Operations with columns and rows in a spreadsheet.
12. Creating formulas in a spreadsheet.
13. Creating charts in STATISTICA.
14. Frequency distribution (frequency, accumulated frequency, relative frequency).
15. The Sturges Rule.
16. The width of the interval. The lower bound of the first interval.
17. Histogram and frequency polygon.
18. The "stem with leaves" graph.
19. Normal distribution.
20. Measures of the central trend (mean, fashion, median, quartiles).
21. Measures of diversity (range, interquartile range, variance, standard deviation, coefficient of variation).
22. The "box with a mustache" graph.
23. The Basic Statistics and Tables module in the STATISTICA program.
24. The Descriptive statistics procedure in the STATISTICA program.
25. Creating a frequency distribution using the Descriptive statistics procedure.
26. Creating histograms using the Descriptive statistics procedure.
27. Creating "stem with leaves" graphs using the Descriptive statistics procedure.
28. Creating "box with moustache" graphs using the Descriptive statistics procedure.
29. Calculation of indicators of central tendency and diversity using the Descriptive statistics procedure.
30. The purpose of hypothesis testing.
31. Statistical tests.
32. Conditions for the use of statistical tests.
33. Hypotheses.
34. The level of significance.
35. The main steps of hypothesis testing.
36. The difference between independent and dependent samples.
37. Conditions for the use of a two-sample t-test.

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38. Student's t-test for two independent samples.
39. Conditions of application of the paired t-test.
40. Student's t-test for two dependent samples.
41. Procedures for calculating the t-test in the STATISTICA program.
42. Checking the condition of the t-test on the normal distribution of the compared samples in the STATISTICA program.
43. Interpretation of the p-value for the t-test in the STATISTICA program.
44. The difference between parametric and nonparametric tests.
45. The two-sample Mann-Whitney test.
46. Conditions for the application of the two-sample Mann-Whitney test.
47. Wilcoxon rank test.
48. Conditions of application of the Wilcoxon rank test.
49. The Nonparametrics module in the STATISTICA program.
50. Interpretation of the p-value for the Mann-Whitney test in the STATISTICA program.
51. Interpretation of the p-value for the Wilcoxon test in the STATISTICA program.
52. Single-factor analysis of variance.
53. Conditions for the use of single-factor analysis of variance.
54. Kruskal-Wallis Test
55. Conditions of application of the Kruskal-Wallis test.
56. Conjugacy tables (size  $m \times n$ ).
57. Conjugacy tables (size  $2 \times 2$ ).
58. Pearson Chi-square test.
59. The Yates Amendment.
60. McNemar's Chi-square test.
61. Pearson Chi-square test in the STATISTICA program.
62. Interpretation of the p-value for the Pearson Chi-squared test in the STATISTICA program.
63. McNemar's Chi-square test in the STATISTICA program.
64. Interpretation of the p-value for the McNemar test in the STATISTICA program.
65. Correlation. The direction of correlation.
66. Conditions for calculating correlation.
67. Pearson's paired correlation coefficient.
68. Interpretation of the Pearson pair correlation coefficient.
69. Assessment of the significance of the correlation coefficient.
70. Spearman's rank correlation coefficient.
71. Interpretation of Spearman's rank correlation coefficient.
72. Organization of medical and statistical research.
73. Review of statistical software packages used in biostatistical research.

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