University of Niš Faculty of Medicine	Study program: **INTEGRATED ACADEMIC STUDIES OF MEDICINE** *ACCREDITATION 2018*	

Course: Medical statistics and Informatics	
Course head: Prof. dr Miodrag Stojanović	
Course status:	Required
Semester : I	**Study year: I**
ECTS: 5	**Course code:** M-I-2

Course purpose:

Acquisition of good command of statistical methodology from the description of observed phenomenon (arrangement and presentation of data; calculation of measures of central tendency and variability) to the use of analysis and conclusions (null hypothesis testing by way of parametric and non-parametric tests; calculation of the degree of correlation and assessment of the parameters of basic set based on the sample), as well as the command of statistical packages (SPSS, Statcalc) and programs for table and graphical representation of data (MS Excel).

Course outcome: (knowledge, skills, attitudes)

A medical doctor will be able to independently devise and select the appropriate method of medical statistics, enabling him to use statistical parameters and PC in a proper way in his research work.

Nr. of classes of active teaching: 60	
Lectures: **30**	**Practice: 30**

Course content

Active teaching:

Theory

Introduction – definition, study contents, significance of statistics in medical profession, probability theory, and law of large numbers.

Descriptive analysis – plan of a statistical research, methods of collection, arrangement, and presentation of results, relative numbers, graphical representation. Measures of central tendency and variability (mean, median, mode, variation interval, interquartile range, variance and standard deviation, coefficient of variation, Z-value).

Distribution of frequency and probability – random variables, mathematical models of frequency distribution, assessment of the parameters of basic set based on the sample, student's t-distribution.

Formulation and testing of hypothesis – null and alternative hypothesis, choice of significance test, student's t-test.

Variance analysis.

Chi-square test – test of distribution form, independence test, test of homogeneity, and additive property of chi-square test.

Regression analysis and linear correlation – dependence or correlation, regression analysis, strength of determination and correlation. Pearson's coefficient of linear correlation and its significance testing. Spearman's rank correlation coefficient. Multiple correlation.

Selection of non-parameter tests.

Linear trend of time series.

Practice

On real examples, instruct the students about the technique of sample selection, arrangement & presentation of data, as well as the techniques of use of parametric and non-parametric tests, assessment of arithmetic mean of basic set based on arithmetic mean of samples, and correlation analysis. Instruction as to the use of statistical packages (SPSS, Statcalc) and programs for table and graphical representation of data (MS Excel).

3. Seminars		
1.	Theoretical distributions: binominal, normal, standardized normal, binomna, normalna, standardizovana normalna, Poisson distribution, student's t-distribution, chi-square distribution, f-distribution.	

2.	Health statistics indicators, standardization of vital statistic indicators	
3.	Excerpt from parametric tests.	
4.	Excerpt from non-parametric tests.	
5.	Analysis of appropriateness of statistical-analytic procedures in selected papers	
6.	Computer-assisted processing of statistical data.	
7.	IT in health care	
8.	Electronic patient record	
9.	Telemedicine	

Recommended literature:

1. Milošević Z. Bogdanović D. Statistika i informatika u oblasti medicinskih nauka. Galaksija, Niš, 2012.
2. Milošević Z. Određivanje veličine uzorka za statističku analizu u biomedicinskim istraživanjima. Medicinski fakultet Niš, 2010.
3. Velizar Stanišić. Osnovne statističke metode za medicinare, Niš 2001.
4. Velizar Stanišić. Praktikum i repetitorijum, Niš 2003.

Teaching methods:

- Theory: lectures
- Practice: calculations and other tasks,
- Interactive teaching on PCs and with workbooks.

Required previously passed exams:

None

Grade (max. 100 points)

Pre-exam obligations:

- Activity during classes: 0 – 10 points
- Seminar papers: 0 – 10 points
- Colloquium: 0 – 30 points

Final exam

- Written exam: 0 – 50 points