Approved
at the meeting of the Council of the Faculty of Medicine No.2,
Minutes No. 6 of 17.06.2014

Dean of the Faculty of Medicine no.2
Associate Professor, PhD
M.Betiu

Approved
at the meeting of the Department of Social Medicine and Management "Nicolae Testemițanu",
Minutes No. 4 of 01.04.2014

Head of the department,
PhD, Professor
D. Tintiuc

SYLLABUS FOR THE STUDENTS OF THE

FACULTY OF MEDICINE NO.2

Course title: **Biostatistics and Research Methodology**

Course Code: **F.05.0.029**

Course Type: **Compulsory**

Number of hours – 68 hours,

Including the lectures – 17 hours and practical work – 51

Credit number of course: **3**

Academic staff: Tintiuc Dumitru, PhD, professor
Raevschi Elena, PhD, associate professor;
Poliudov Serghei, PhD, associate professor;
Bologan Nicolae, PhD, associate professor.

Chișinău 2014

I. Aim of the course

Creation of definitions and base standards for scientific research theory sphere through the knowledge of modern methods, used in practical research. Acquisition of knowledge necessary for the use of modern methods of record keeping, obtaining of some theoretical definitions applicable in research and some standards or rules necessary to highlight research results used in undergraduate thesis.

II. Objectives obtained in teaching the course

- At the level of knowledge and understanding:

- To know theoretical concepts of Methodology of Scientific Research;
- Development of a clear and continuous thinking, capable to manage and process the data.
- To know the principles, technology, methods and used techniques in Scientific Research.
- To understand the correlation between modern methods used in Methodology of Scientific Research;
- To identify possibilities of analysis and interpretation, as well as limits of modern methods used in Scientific Research.

- At the level of application

- To analyze definitions, theoretical and practical methods of Methodology of Scientific Research;
- To use statistical methods and techniques in scientific research;
- To demonstrate capability of analysis, interpretation and presentation of scientific research results;
- To use basic knowledge of statistics mathematics, necessary for its usage in other disciplines;
- To know special language and terminology specific for scientific style;
- To evaluate the information contained in an article or report of specialty and to appreciate its relevance;
- To be able to search for scientific information using classical methods or computer methods for search and selection of data;
- To use methods of writing and presentation of a report.

- At the level of integration

- To evaluate theoretical and applied value of Methodology of Scientific Research;

III. Provisional terms and conditions

Health research is an interdisciplinary filed based on a large specter of knowledge. "Biostatistics and Research Methodology" is a discipline, which allows to integrate and analyze obtained knowledge. Methodology of Scientific Research is necessary for evaluation of research activities with modern research standards compliance. Being a discipline of integration, it correlates with other disciplines that use Statistics.

For a better understanding of the discipline it is necessary to have knowledge of mathematics and fundamental and applicative medicine spheres. Knowledge of a computer is an indispensable requirement.

IV. Basic contents of the course

A. Lectures:

	Themes	**Hours**
1	Introduction to Basic Biostatistics and Research Methodology	3
2	Biostatistics Basics. Descriptive Statistics. Graphic Presentation.	2
3	Biostatistics Basics. Inferential Statistics.	2
4	Introduction to Research Methodology	2
5	Overview of Epidemiological study designs. Case series study and Cross sectional Study.	2
6	Overview of Cohort and Case Control Study.	2
7	Overview of Clinical Trial Study.	2
8	The Presentation of Research findings. Plagiarism and Scientific Research. Intellectual property protection.	2

B. Practical Classes:

	Topics	Hours
1.	Biostatistics and Research Methodology: G*eneralization.*	3
2.	Descriptive statistics: *Data Presentation.* *Definition of variable* *Types of variable* *Scales of Measurement* *Tables* *Graphs*	3
3. ***4.***	Descriptive statistics: *Data Summary Measures* *Measures of Central Tendency* *Measures of Variability.* *The distribution of data (normal, skewed and binominal distribution)*	6
5. ***6.***	Descriptive statistics: *Rates and Standardization*. *Rates: The types and methods of calculation. Graph presentation.* *Standardization of Rates: Direct Method of Standardization.*	6
7.	Correlation: *Pearson's Correlation Coefficient* *Spearman's Rank Correlation Coefficient*	3
8.	Inferential statistics: *Probability Theory and Hypotheses testing introduction* *The meaning of Probability Theory* *Populations and Samples, The Sampling* *Hypotheses General Concepts* *Estimation and Hypotheses Testing*	3
9.	Inferential statistics: *The Parametric and Non-Parametric Methods of Hypotheses Testing.* **Midterm I (Biostatistics)**	3
10.	The Research Methodology Introduction *Research: definition, characteristics and types* *Use of Statistical Software* *Steps of Research Process* *Formulation of research problem* *Reviewing the literature. Use of a computerized medical Database* *Formulation of objectives*	1.5
	Preparing the Research Design *Research Design Definition* *The Steps of Research Design* *The first step of Research Design: Determining Sample Design:* -The sample (Who):study population and unit of observation, determining of variables -Sample size (How many) -Sampling Type (How) *The second step of Research Design: Tool for Data collection*	1.5
11.	Preparing the Research Design *The third step of Research Design: Methods of Data Collection* -Classification of Data Collection Methods (Epidemiological Studies) -Overview of Epidemiological studies. -Case series Study and Cross sectional Study.	1.5

	Preparing the Research Design *Case Control Study*	1.5
12.	Preparing the Research Design: *Cohort Study*	3
13.	Preparing the Research Design: *Clinical Trial Study* **Midterm II (Research Methodology)**	3
14.	Reports on Research Findings: Students' Presentations	3
15.	Reports on Research Findings: Student's Presentations	3
16	Reports on Research Findings: Student's Presentations	3
17	Reports on Research Findings: Student's Presentations	3

V. Recommended Bibliography

A. Compulsory:

1. Elena Raevschi, Tintiuc D., Biostatistics and Research Methodology, 2012,- 94 p.
2. Darius Singpurwalla. A Handbook of Statistics: An overview of statistical methods, 1st Edition, 2013, - 79 p.
3. David Brink. Essentials of Biostatistics, 2010, 102 p.
4. David Brink. Essentials of Biostatistics: Exercises, 2010, 29 p.
5. Marcello Pagano, Kimberlee Gauvreau. Principles of Biostatistics, Second edition. 2000, 524 p.
6. Beth Dawson, Robert G.Trapp. Basic & Clinical Biostatistics, Fourth Edition. 2004, 438 p.

B. Additional:

1. Tintiuc D., Badan V., Elena Raevschi.,et al., Suport Metodologic Biostatistica. si Metodologia Cercetării Ştiinţifice, 2011, - 245 p.
2. Miller, Hugh, Descriptive statistics, The Open Learning Foundation. - Edinburgh : Churchill Livingstone , 1995. - 125 p.
3. Puri, Basant K. Statistics for the Health Sciences : using SPSS / B. K. Puri. - London : W. B. Saunders , 1996. - 156 p.

VI. Methods of the instruction

Both classical methods and those considered today to be more effective for university education are used for more effective learning of the discipline "Biostatistics and Research Methodology": synthetic learning method, analytic or sequential learning method, progressive learning method with recurrent repetitions. Forms of teaching being: hearing, formation of skills during computer-assisted practical lessons, individual computer project, group project, homework, library meetings and review literature

VII. Suggestions for individual activity

In the context of European integration of the university education, where the proportion of the individual activity of the student is the dominant one, the individual activity in the learning process that gains more importance. Thus, as suggestions for studying the subject "Information systems in medicine" can be proposed:

1. Fragment or divide the material into logical, unitary and compact study units.
2. Learn each study unit established according to the integral education model, namely follow the steps below:
    a. integral reading of familiarization with the content of the text,
    b. a second reading for thorough understanding of the text,
    c. a third reading for taking notes,
    d. a repetition in the presence of extracted notes, followed by a last repetition in memory.

This active processing of the material provides an in-depth memorizing and long-term remembering of the information.

VIII. Methods of assessment

A. Semester assessment

This course will include two midterms, a project, consisting of an oral presentation, and lectures participation.

- Midterms

a. Theoretical part:

Midterm test nr.1 – Biostatistics

Midterm test nr.2 – Research Methodology

b. *Practical part:* – Project (PowerPoint Presentation)

Absences on midterm test need to be arranged at least 4 weeks prior to the examination with permission of a lecturer. Cheating on exams will not be tolerated and can result in a failing grade.

- Project, Oral presentation

Students will identify a chronic disease topic of interest. The topic can be chosen either from the list posted on the course website or another topic with the approval of a lecturer. First come, first serve since only one presentation will be allowed per topic.

You will present a no more than 15 minute (timed) PowerPoint presentation on your approved topic to the class on the appointed date. An additional five-minute period will be allowed for questions.

- *Lecture participation*

One point for each lecture decent participation (without professor personal note to you), with additional 2 point for extraordinary contributions (maximum of 10 points). You can monitor your points at the course instructor.

Semester Grading

Criteria	Coefficient of calculation	Max. points	Max. points of calculation
Midterms mean (MM)	0.6	10	6
Project (P)	0.3	10	3
Lecture participation (+bonus) (LP)	0.1	8+2	1

0.6 MM + 0.3 P + 0.1 LP

B. *Final evaluation (Winter Session Exam):*

On the examination in "Basic Biostatistics and Research Methodology" students with the average grade less than 5 (five) and those who did not work off absences from practical classes are not admitted.

Students are obliged to take the examination on the dates fixed in the examination schedule. Students should be informed of the dates of examinations at least 3 weeks before the commencement of an examination session.

A student shall not take an examination without the Examination Sheet and Student Record Book. Grades received during examinations are recorded in the student's Record Book, Examination Sheet and University Database.

The Exam in "Biostatistics and Research Methodology" includes a multiple-choice test ("Test Editor" variant USMF "Nicolae Testemiţanu"). In order to pass the examination the student must receive at least the grade "*Low*".

Multiple-choice test consists of 100 questions on all the themes of the course of "Biostatistics and Research Methodology", from which 40% are simple choice, 60% are multiple choice. Students are given 2 (two) academic hours to answer the test. The test assessed with the grade from 0 to 10.

The final grade consists of 3 (three) components: 1) semester grade (SG); 2) multiple-choice test (MCT); 3) Practical skill (PS).

0.5 SG + 0.3 MCT + 0.2PS

The assessment is done according the scale:	Final Grade
5	5
5,1-5,5	5,5
5,6-6,0	6
6,1-6,5	6,5
6,6-7,0	7
7,1-7,5	7,5
7,6-8,0	8
8,1-8,5	8,5
8,6-9,0	9
9,1-9,5	9,5
9,6-10	10

If a student receives a grade below "5" on the examination in the subject or if a student was absent on the scheduled day, he/she is entitled to have a re-examination.

Students may appeal his/her exam grade, but not later than 24 hours since the results were announced.

IX. Language of study

English, Romanian, French, Russian