

MED3007- Research Methodology and Biostatistics

Course title	Code	Semester	Type of course	Course structure and volume (hours)			ECTS
Research Methodology and Biostatistics	MED3007	V	Mandatory	Lecture	20	120	4
				Seminar	40		
				Midterm Exams I, II	2		
				Final Exam	2		
				Indep. Work	56		
Faculty, the educational program and level of education	School of Dental Medicine One cycle (5-year duration) Higher Educational Program “Dentistry”						
Staff	Maia Butsashvili , invited teacher MD, PhD Mob: 591706799 E-mail: maia.butsashvili@bauinternational.edu.ge Londa Rukhadze , Invited teacher, PHD student, Mob.tel: 555 55 57 77, E-mail: londa.rukhadze@bauinternational.edu.ge Personal one-to-one consultation can be arranged at an agreed upon date and time.						
Duration	17 weeks						
Prerequisite	MED5019						
Aim	<p>The goal of the course is to cover the basic tools for collection, analysis, and presentation of data and different research methodology. Central to these skills is assessing the impact of chance and variability on the interpretation of research findings and subsequent recommendations. Topics covered include: general principles of study design; hypothesis testing; review of methods for comparison of discrete and continuous data.</p> <p>Course will give knowledge on selected important topics in biostatistical concepts and reasoning. This course covers survey methods and data types. Specific topics include tools for describing central tendency and variability in data; methods for making inference on populations in question and sampling; hypothesis testing and its application to group comparisons; issues of power and sample size in study designs; and random and other types of sampling.</p>						
Methods of Teaching/Learning	Lecture Group Work Presentation						
Assessment System and Criteria	Attendance – the student is obliged to attend 70% of the total number of course hours						

The knowledge of the student is evaluated by 100 point-based evaluation system out of which 20 points are allocated for the current activity, 20 for each of 2 midterm exams and 40 points for the final exam.

1. Current activity - 20 points, including the following:

- 1.1 Activity (discussion) - 10 points;
- 1.2 Presentation – 10 points

Activity during seminars is assessed with the following criteria (10 points)

10 points – A student exhibits profound knowledge of the topic: he/she presents it in a consistent and concise way. A student is smart thinker and shares her/his opinion around the topic in question. The answer includes correct terminology. Comprehensive knowledge of the main and additional literature and the ability to put it into practice are obvious.

9 points – A student exhibits profound knowledge of the topic: she/he presents it in a cohesive and concise way. A student has good thinking abilities but her/his opinions around a problematic issue lacks persuasion. The answer includes correct terminology. Comprehensive knowledge of the main literature and the ability of its usage is obvious.

8 points – She/he profoundly knows the topic and presents in a consistent way. A student has good thinking ability. However, she/he is not succinct while expressing her/his opinion. The answer includes correct terminology. Comprehensive knowledge of the main literature and the ability of its usage is obvious.

7 points – Her/his knowledge of the topic is less profound. Her/his answer is comprehensive but lacks consistency. She/he is not good at discussing a problematic issue. A terminology in an answer is partially correct. She/he has average knowledge of topics. Knowledge of the main literature is visible. It is hard for her/him to make conclusions.

6 points – Her/his answer is comprehensive but lacks consistency. A terminology in an answer is partially correct. She/he has average knowledge of topics. It is hard for him/her to make conclusions.

5 points – Her/his answer lacks consistency. A terminology in an answer is partially correct. She/he cannot answer a problematic question. She/he has average knowledge of topics. It is hard for her/him to make conclusions.

4 points – Her/his answers are general. She/he does not exhibit the knowledge of the terminology. Content is not coherent. She/he cannot properly employ literature.

3 points – His/her answers are general. Content is not coherent. He/she does not exhibit the knowledge of terminology. He/she finds it difficult to discuss and analyze a topic. He/she cannot properly employ literature.

2 points – Her/his answer is general. She/he does not exhibit the ability of judgement. She/he does not know terminology. Content is not coherent.

1 point – Her/his answer is not satisfactory. She/he does not exhibit the knowledge of terminology. She/he presents a topic in a chaotic way that is often wrong. She/he is not familiar with literature.

0 point – A student does not exhibit minimum knowledge of the topics.

Presentation is assessed with the following criteria (10 points)

- 1. Topicality of the problem - 2 points;
- 2. Academic aspect - 2 points;
- 3. Visual and technical quality of the material – 2 points;
- 4. Ability to engage into discussion and listen - 2 points;
- 5. Proper language and style - 2 points;

2. Two Midterm Exams - each 20 points;

The exam is conducted in a test-based form (Multiple Choice Questions - MCQ). The test includes 50 questions and the value of each is 0.4 point(s). The highest possible score is 20 for each exam.

3. Final Exam - 40 points

Final Exam is conducted in a combined way:

- Test-based form (MCQ -100 tests with 0.4 point(s) for each question.

Prerequisite for Final Exam are:

- Prerequisite for Final Exam is the situation when at least 50 % of the current assessment level is achieved.
- 70% of learning course hours should be attended.

The exam is considered being passed by the student if he /she receives **50% or more** out of the highest evaluation for the exam (40x50/100=20 points). When the total evaluation of the student (current evaluation + midterm exams' evaluations + final exam evaluation) is more than 40 but less than 51 points, even though the exam grade threshold is passed, the learning course is considered not being covered and the student is given the right to exam retake during the additional examination period.

If the final evaluation for the Learning Course, after taking the additional exam, (current evaluation + midterm exams evaluation + final exam evaluation) is less than 51%, the learning course is not considered covered and it must be taken again.

In summary, the student is awarded the credit in case he/she accumulates minimum 51% out of 100%.

Positive scores:

- (A) Excellent- 91 or more points;
- (B) Very Good- 81-90 points;
- (C) Good- 71-80 points;
- (D) Satisfactory- 61-70 points;
- (E) Enough- 51-60 points;

Negative scores:

- (FX) Failure - 41-50 points: the student needs more independent work and is granted a single attempt of exam retake;
- (F) Fail - 40 points or less: the student's conducted work is not sufficient and needs to take the course again.

After the results of final exams are available, students with FX assessment have a right to retake an exam during an additional exam week in the same semester.

	An interval between a final and a corresponding additional exam must be at least 5 days after the results of a final exam become available
The core literature	<ol style="list-style-type: none"> Basic Biostatistics: Statistics for public Health Practice- B.Burts Gertsman; Jones & Bartlett Learning; 2nd ed. 2015; Medical biostatistics- Indrayan Abhaya; CRC Press; 3rd.ed. 2013; Introductory Statistics-Neil A. Weiss; Pearson; 10th.ed. 2016; High-Yield: Biostatistics, Epidemiology, & Public Health-Anthony N. Glaser; Wolter Kluwer; 4th.ed. 2014;
The auxiliary literature	<ol style="list-style-type: none"> Principles in Biostatistics Pagano, Marcello; Duxbury; 2nd.ed. 2000; Practical Statistics for Medical Research-Altman,Douglas G; Chapman & Hall/CRC; 1991; An EasyGuide to Research Design & SPSS-Beth M. Schwartz; Janie H. Wilson; Sage; 2015;

Learning Outcomes

NQF*	COURSE LEARNING OUTCOMES	PROG. LO	LECTURE	SEMINAR	MI DTE RM EX. I	MI DT ER M EX. II	FINAL EXAM	ASSES. METH.
KNOWLEDGE AND AWARENESSES	<ul style="list-style-type: none"> Recognizes and gives examples of different types of data arising in public health and clinical studies Describes the roles biostatistics serves in public health and biomedical research; Understands the importance of medical research in Health care Explains general principles of study design and its implications for valid inference when, for example, identifying risk factors for disease, isolating targets for prevention, and assessing the effectiveness of one or more interventions; Has general knowledge outside medicine 	1.2.	X	X	x	x	x	<ul style="list-style-type: none"> discussion presentation MCQ

SKILL	<ul style="list-style-type: none"> • Applies numerical, tabular, and graphical descriptive techniques commonly used to characterize and summarize public health data; • Assesses data sources and data quality for the purpose of selecting appropriate data for specific research questions; • Translates research objectives into clear, testable statistical hypotheses; • analyses statistical data; • Evaluates computer output containing statistical procedures and graphics • has an access specific information sources; • critically analyses the published literature, making conclusion and using them in practice • Applies research skills 	1.2. 2.2.		X	x			<ul style="list-style-type: none"> • discussion • presentation
RESPONSIBILITY AND AUTONOMY	<ul style="list-style-type: none"> • proceeds Information independently • analyses the information 	11.1 11.2 11.4.		x				presentation

Learning Course Content

weeks	Topics	Lecture	Seminar
I	Introduction in biostatistics; Basic in medical research. Studies types.	1	1
	Problem, Hypothesis; Research protocol;	1	2
II	Collecting data; Observation research; Importance of questionnaire for research	1	2
	Cross sectional process in research; Medical experiment	1	2
III	Prevalence; Incidence	1	2
IV-V	Descriptive and inferential statistic ; Variable; P-value, standard deviation ;	2	4
VI	SPSS –statistical programme	2	4
VII-VIII	Midterm exam		1
XIX	Types of study. Survey and comparative studies	1	2
X-XI	Frequency distribution. Stemplot .Frequency charts.	2	4
XII	Frequency tables.	1	2
XIII	Quartiles. boxplots	1	2
	Probability	1	2
XIV	ROC curve	1	2
	Correlation	1	2
XV	Statistical analysis	1	2
XVI-XVII	Calculation of Risk, correlation; Present of presentation	2	4
XVIII-XXII	Final Exam		2

