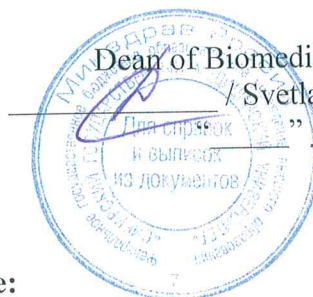


APPROVED BY

Dean of Biomedicine Department
/ Svetlana V. Gusakova

2020



Course Name:

MEDICAL STATISTICS

Field of study: Nuclear Science and Technology

Programme name: Nuclear Science and Technology

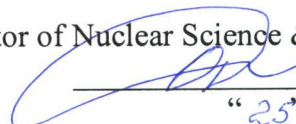
Specialization: Nuclear medicine

Level of study: Master Degree Programme

Semester, year: semester 2, year 1

APPROVED BY

Director of Nuclear Science & Engineering School

 / Oleg Yu. Dolmatov
"23" 06 2020

Course Name: Medical Statistics

Field of study: Nuclear Science and Technology

Programme name: Nuclear Science and Technology

Specialization: Nuclear medicine

Level of study: Master Degree Programme

Year of admission: 2019

Semester, year: semester 2, year 1

ECTS: 1

Total Hours: 36

Contact Hours: 16


- **Lectures:** 8
- **Practical experience:** 8

Self-study: 20

Assessment: Credit-test

Division: Biomedicine Department of Siberian State Medical University

Director of Programme

 / Vera V. Verkhoturova

Instructor

 / Konstantin S. Brazovskii

Course Name: Medical Statistics

Course Overview

Course Objectives	<p>The objective of the course is to study recent methods of applied statistics and their use in medical practice. The course is aimed at students to obtain understanding of applied statistics and specific methods to process medical data; master basics of evidence based medicine as a modern paradigm in clinical practice; study the best published biomedical research and clinical trials.</p>
Learning Outcomes	<p>Upon completion of the course, a graduate will obtain the knowledge of:</p> <ul style="list-style-type: none"> - basics of evidence based medicine; - methods of applied statistics and their use in healthcare practice; - typical study designs and their applications; - specific and general purpose software to process biomedical data; - fundamental principles of report structuring and presentations preparation in a foreign language (English), accepted in the international community. <p>Upon completion of the course, graduates are expected to develop the following skills:</p> <ul style="list-style-type: none"> - to use methods of applied statistics to process biomedical data; - to use the most appropriate study design to ask a certain practical questions; - to obey the ethical rules of good research practice; - to apply principles of evidence based medicine in biomedical research and practice; - to prepare reports and presentations in a foreign language (English) following the rules and standards accepted in the international community. <p>Upon completion of the course, graduates should acquire the practical experience in:</p> <ul style="list-style-type: none"> - use of the applied statistics methods to process biomedical data; - designing a plan of biomedical experimental research; - use of the specific and general purpose software to process biomedical data.
Course Outline	<p>The training course is delivered through the following teaching modes:</p> <ul style="list-style-type: none"> – 4 lectures; – 4 practical experiences. <p>The course consists of 2 sections, which are given below.</p> <p>Section 1. Introduction to medical statistics</p> <p>Section 2. Methods to process biomedical data</p> <p>Each section includes two lectures and two practical experiences.</p> <p>The course includes 1 seminar with a test and case study report. The test consists of 10 multiple-choice questions with one correct answer from the four given options. The test is rated at 2 points. The case study report describes a real situation along with supportive questions to substantiate the conclusion. The case report is rated at 2 points. Overall, the seminar gives up to 4 points. In addition, students are requested to perform 4 reviews related to the topics of</p>

	the course sections. Each review is scored with 15 points. The training course ends with a colloquium, which is rated at a maximum of 20 points.
Course Structure	<p>The training course includes 2 sections: Section 1. “Introduction to medical statistics” and Section 2. “Methods to process biomedical data”</p> <p>Section 1. Introduction to medical statistics Medical statistics and its role in biomedical research and organization of public healthcare systems. Evidence based medicine as a paradigm of public healthcare. <i>Topics of lectures:</i> Lecture 1. Introduction to medical statistics Lecture 2. The fundamentals of evidence based medicine and good clinical practice <i>Topics of practical experiences:</i> Practical experience 1. Statistical processing of epidemiological data. Practical experience 2. Testing statistical hypotheses. Comparison of measures of the central tendency and frequency of evidence occurrence.</p> <p>Section 2. Methods to process biomedical data Types of biomedical experimental research, planning research according to good clinical practice. Typical study designs for biomedical experiments. <i>Topics of lectures:</i> Lecture 3. Planning research according to good clinical practice. Lecture 4. Typical designs of biomedical experiments. Planning research involving laboratory animals and volunteers. <i>Topics of practical experiences:</i> Practical experience 3. The best biomedical research practice. Typical designs of biomedical studies. Practical experience 4. Application of general-purpose spreadsheet software to process biomedical data.</p>
Facilities and Equipment	<p>Teaching of the training course is provided by the State Siberian Medical University. The educational process is organized on the basis of the TPU and SSMU, and is supplied by the following facilities and equipment:</p> <ul style="list-style-type: none"> – Classroom for all types of training sessions, consultations, ongoing monitoring and interim certification (classroom): 634034, Tomsk region, Tomsk, Moskovskii Trakt Street, 2/7, Block B, room 610 - Chalkboard-1 PC., student table-10 PCs., chair-18 PCs., TV panel - 1 PC., laptop - 14 PC, Media projector – 1 PC.
Grading Policy	<p>In accordance with TPU rating system we use:</p> <ul style="list-style-type: none"> - Current assessment which is performed on a regular basis during the semester by scoring the quality of mastering of theoretical material and the results of practical activities during seminars (performance tests, case-tasks). Max score for current assessment is 100 points, min – 55 points. <p>The final rating is determined by summing the points of the current assessment during the semester and colloquium scores at the end of the semester. Maximum overall rating corresponds to 100 points, min pass score is 55 points.</p>
Course Policy	<p>Class attendance will be taken into consideration when evaluating students’ participation in the course. Students are expected to actively engage in class discussions about the assigned readings. Attendance is strictly controlled. All classes require obligatory presence.</p>

Teaching Aids and Resources	<p>Compulsory reading:</p> <ol style="list-style-type: none"> 1. Burbridge, B. Undergraduate Diagnostic Imaging Fundamentals / B. Burbridge, E. Mah. – Montreal : University of Saskatchewan, 2017. - 743 p. - Текст: электронный // Open Textbook Library. – URL: https://open.umn.edu/opentextbooks/textbooks/undergraduate-diagnostic-imaging-fundamentals (дата обращения: 20.09.2020). – Режим доступа: по подписке. 2. Hendee, W. R., Ritenour, E. R. Medical Imaging Physics / W. R. Hendee, E. R. Ritenour. - Fourth Edition. - New York: Wiley Liss, 2002. - 512 p. - Текст: электронный // Wiley Online Library. – URL: https://onlinelibrary.wiley.com/doi/book/10.1002/0471221155 (дата обращения: 20.09.2020). – Режим доступа: по подписке. 3. Prasad K. Fundamentals of Evidence-Based Medicine / K. Prasad. - Second Edition. – New Delhi: Springer, 2013. - 165 p. - Текст: электронный // SpringerLink. – URL: https://link.springer.com/book/10.1007/978-81-322-0831-0 (дата обращения: 20.09.2020). Режим доступа: по подписке. <p>Additional reading:</p> <ol style="list-style-type: none"> 1. Saha, Gopal B. Basics of PET Imaging: Physics, Chemistry, and Regulations / Gopal B. Saha. – New York: Springer Science+Business Media, Inc., 2005. - 219 p. - Текст: электронный // SpringerLink. – URL: https://link.springer.com/book/10.1007/b138655 (дата обращения: 20.09.2020). Режим доступа: по подписке. 2. Hamidreza Mahboobi. Evidence- Based Medicine for Medical / Hamidreza Mahboobi, Sharma Akshay, Khorgoei Tahereh, Keramat Allah Jahanshahi [and etc.] //Australasian Medical Journal. - 2010. – № 3. – P. 190-193. - URL: https://www.researchgate.net/publication/43655583_Evidence-Based_Medicine_for_Medical_Students (дата обращения: 20.09.2020). — Режим доступа: свободный доступ из сети Интернет. - Текст : электронный. <p>Internet resources:</p> <ol style="list-style-type: none"> 1. ELS SSMU: Access mode: http://irbis64.medlib.tomsk.ru 2. ELS "Book-Up»: Access mode: http://books-up.ru 3. ELS «Lan»: Access mode: http://e.lanbook.com 4. ELS «Urayt»: Access mode: http://www.biblio-online.ru 5. Springer: Access mode: http://link.springer.com 6. EBSCOhost MEDLINE with Full Text: Access mode: http://search.ebscohost.com 7. ClinicalKey: Access mode: https://www.clinicalkey.com 8. PubMed (Medline): Access mode: http://pubmed.com or http://www.ncbi.nlm.nih.gov/pubmed 9. Science: Access mode: http://www.sciencemag.org 10. ScienceDirect: Access mode: http://www.sciencedirect.com
Instructor	<p>Brazovskii Konstantin Stanislavovich, Doctor of Technical Sciences, Professor, Siberian State Medical University, e-mail: bks_2005@mail.ru, phone: +7 (960) 976-09-18</p>