COURSE DESCRIPTION – Research Methodology and Biostatistics

Academic year 2025/2026

Course title in	Polish	Metodologia badań i biostatystyka
	English	Research Methodology and Biostatistics
Course Syllabus prepared by		Prof. Grażyna Nowak-Starz, PhD,DSc; dr Agnieszka Strzelecka,PhD
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1. GENERAL COURSE CHARACTERISTICS

2.1. Language of Instruction	English
2.2. Prerequisites *	Basic knowledge of research methodology. Ability to work in the Microsoft Office environment, with particular emphasis on Microsoft Excel.

2. DETAILED COURSE CHARACTERISTICS

2.1.	Form of Instruction		Lectures (e-learning), practical classes
2.2.	Place of Instruction		Online learning platform, Microsoft Teams (lectures), computer laboratories of Collegium Medicum UJK (practical classes)
2.3.	Form of assessment		Credit with grade
2.4.	Teaching Methods		Lectures: problem-based lecture; interactive lecture. Practical classes: practical exercises, discussion, case studies.
2.5.	Bibliography	Required reading	K.S.Kushwaha;C.M.Pandey Biostatistics: Basic Concepts and Methodology eBook Collection (EBSCOhost), 2020
		Further reading	https://library.usmf.md/sites/default/files/2023-05/Raevschi_BSTC%26RM_engl.pdf

3. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

3.1. Course objectives *(by form of instruction)*

Lectures
C1. To familiarize students with the principles of designing and planning quantitative, qualitative, and mixed-method research in medical sciences and health sciences.

Practical classes
C1. To develop sensitivity to the necessity of recognizing the research context and translating it into appropriate types of statistical variables.
C2. To consolidate the ability to distinguish between concepts, terminology, and methods of statistical inference.
C3. To apply statistical analysis methods in practice and generalize results obtained from a sample to a broader population.

3.2. Course content *(by form of instruction)*

Lectures
Methodology as a scientific discipline – clarification of key concepts. Types of scientific research and their application in health sciences and medical sciences.
Qualitative and quantitative research. Measurement in scientific research. Sampling methods.
Copyright protection and ethical principles in research in health sciences and medical sciences. Types of scientific publications. Application of research in medical practice – evidence-based medicine.

Practical Classes
Creation of databases. Descriptive statistics – selection, calculation, and interpretation of statistical measures; graphical presentation of data according to their type and measurement scale. Parametric and non-parametric tests – principles of statistical inference. Survival analysis. Survival analysis using the Cox proportional hazards model. Logistic regression. Interpretation of logistic regression parameters; calculation and interpretation of the odds ratio.
Classes are conducted using Microsoft Excel and STATISTICA software.

3.3. Intended learning outcomes

	Upon successful completion of the course, the student
W01	Knows and understands the principles of conducting scientific research, including selection of an appropriate study design, study group, and planning of research procedures and tools.
W02	Knows and understands the principles of database creation, variable transformation, and data verification.
W03	Knows and understands the principles of applying statistical methods and tools for analysis of collected research data, as well as principles of statistical inference and drawing conclusions based on statistical analysis.
U01	Conducts scientific research in accordance with legal and ethical standards.
U02	Prepares a research study design outline.
U03	Selects an appropriate statistical test depending on the aim of the analysis, type of variables, and fulfillment of statistical test assumptions.
U04	Performs statistical analysis correctly using designated statistical software.
K01	Conducts scientific research in accordance with legal and ethical principles.
K02	Is prepared for continuous professional development, including expanding knowledge of statistical analysis methods.

3.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)													
	Final assessment test			Final assessment test										
	Form of classes			Form of classes										
	W	C	...	W	C	...								
W01	+													
W02	+													
W03	+													
U01					+									
U02					+									
U03					+									
U04					+									
K01					+									
K02					+									

3.5. Criteria for Assessing Learning Outcomes

Form of classes	Grade	Grading criteria
lecture (L)	3	at least 61% and no more than 69% of the total possible examination points
	3,5	at least 69% and no more than 77% of the total possible examination points
	4	at least 77% and no more than 85% of the total possible examination points
	4,5	at least 85% and no more than 93% of the total possible examination points
	5	at least 93% of the total possible examination points
Practical classeS (PC)	3	at least 61% and no more than 69% of the total possible project points
	3,5	at least 69% and no more than 77% of the total possible project points
	4	at least 77% and no more than 85% of the total possible project points

4,5	at least 85% and no more than 93% of the total possible project points
5	at least 93% of the total possible project points

4. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload
DIRECT PARTICIPATION (CONTACT HOURS WITH INSTRUCTOR)	*45*
Participation in lectures	15
Participation in classes/practical classes	30
STUDENT'S INDEPENDENT WORK (NON-CONTACT HOURS)	
Preparation for the lecture	
Preparation for classes/practical classes	10
TOTAL NUMBER OF HOURS	*55*
ECTS CREDITS for the course of study	**2**

Approved for implementation *(date and signatures of course instructors for the given academic year)*

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*delete as appropriate