

A COURSE SYLLABUS – DOCTORAL SCHOOL
regarding the qualification cycle from 2025/2026 to 2028/2029

GENERAL INFORMATION ABOUT COURSE				
Course title	RESEARCH METHODOLOGY			
Name of the unit running the course	Doctoral School of the University of Rzeszów			
Type of course (<i>obligatory, optional</i>)	compulsory			
Year and semester of studies	year I; semester I – II			
Discipline	Medical sciences			
Language of Course	Polish language			
Name of Course coordinator	Radosław Chaber, PhD, Professor at the University of Rzeszów			
Name of Course lecturer	Radosław Chaber, PhD, Professor at the University of Rzeszów			
Prerequisites	Academic education at Master's level; knowledge, skills and social competences at PRK level 7; foreign language knowledge at B2 level (ESOKJ).			
BRIEF DESCRIPTION OF COURSE (100-200 words)				
<p>Subject: Research methodology develops the competencies necessary for planning, implementing and critically evaluating research in the disciplines of medical sciences and health sciences. Activities include formulating research questions, selecting the study design (observational and experimental), operationalizing variables, selecting the population and sampling methods, identifying biases and confounders, ethical principles of research involving human participants, and the basics of the statistical analysis plan. The doctoral student prepares elements of the research protocol (objectives, hypotheses, methods, analysis plan, data management plan) and learns the principles of reporting results in accordance with standards (e.g. CONSORT, STROBE, PRISMA). The result of education is the ability to independently design a study, collaborate in a research team and communicate project assumptions in the scientific community.</p>				
COURSE LEARNING OUTCOMES AND METHODS OF EVALUATING LEARNING OUTCOMES				
Learning outcome	The description of the learning outcome defined for the course	Relation to the degree programme outcomes (symbol)	Learning Format (Lectures, classes,...)	Method of assessment of learning outcomes (e.g. test, oral exam, written exam, project,...)
Knowledge (no.)	knows and understands, has knowledge			
P8S_WG/3	Knows and understands the concepts of scientific research methodology (including research question, hypothesis, variables, endpoint, bias, confounding) and is able to use terminology in Polish and English.	P8S_WG	Conversatory	colloquium/ test, discussion
P8S_WG/4	Knows the principles of research planning and execution, including the selection of appropriate research design, procedures, tools and data sources; understands the basics of biostatistics and the interpretation of results.	P8S_WG	Conversatory	colloquium/ test, written work)
P8S_WK/3	He is familiar with the principles of knowledge transfer to clinical and social practice, including the basis for	P8S_WK	Conversatory	oral statement, written work

	implementation, usability assessments of research results, and elements of intellectual property commercialization/protection in the context of research projects.					
Skills (no.)	can					
P8S_UW/1	It can define a research problem, formulate an objective and hypotheses, design a study (selection of populations, methods, endpoints and tools), and plan analysis and draw conclusions based on data.			P8S_UW	Conversatory	draft protocol, practical tasks
P8S_UK/1	Can communicate the assumptions and results of a research project at a level that allows participation in an international environment, including preparing a presentation and description of the protocol in a foreign language (B2).			P8S_UK	Conversatory	presentation, continuous evaluation
P8S_UO/1	Able to plan and execute a research project individually and in a team, with role allocation, scheduling, data quality control and progress documentation.			P8S_UO	Conversatory	team project/ project plan
Social competence (no.)	is ready to					
P8S_KR1	It is ready to uphold and develop the ethos of the scientific community, including research integrity, respect for ethical principles, protection of intellectual property and transparency in the dissemination of results.			P8S_KR	Conversatory	continuous evaluation, draft/ protocol
Semester (no.)	Lectures	seminar	Conversatory / Lab classes	Internships	others	ECTS
I - II	-	-	2 x 30 hrs. – 60 hrs.	-	-	2 x 3 ECTS – 6 ECTS
METHODS OF INSTRUCTION						
<ul style="list-style-type: none"> - DISCUSSION AND PROBLEM-SOLVING WORKSHOPS (WORKING ON EXAMPLES OF RESEARCH PROJECTS AND PROTOCOLS); - CRITICAL ANALYSIS OF PUBLICATIONS (ASSESSMENT OF STUDY DESIGN, BIAS RISK AND REPORTING QUALITY); - EXERCISES IN CONSTRUCTING RESEARCH QUESTIONS, HYPOTHESES, ENDPOINTS, INCLUSION/EXCLUSION CRITERIA; - WORKING IN SMALL GROUPS: PREPARING A DRAFT STUDY PROTOCOL AND A DATA ANALYSIS AND MANAGEMENT PLAN; - DOCTORAL STUDENT PRESENTATIONS AND MODERATED DISCUSSION, CONSULTATIONS WITH THE SUPERVISOR/AUXILIARY SUPERVISOR 						
COURSE CONTENT						
<p>1. Lecture / Conversatorium:</p> <p>Semester I: introduction to research methodology; research question, objectives and hypotheses; types of studies (descriptive, analytical, observational, experimental); operationalization of variables and selection of endpoints; population selection and sampling methods; systematic errors (bias), confounding factors (confounding) and control bases; ethical principles of research involving human participants and documentation (consent, bioethics committee).</p> <p>Semester II: statistical analysis plan (variables, method selection, subgroup analysis, missing data); sample size and statistical power (assumptions); basics of randomization and blinding; data management and quality (CRF, dictionary of variables, GDPR/GDPR, FAIR principles); transparency and reproducibility (open science); standards for reporting results (CONSORT, STROBE, PRISMA) and preparation for publication and presentation.</p>						

2. Exercises / laboratories / other:
Preparation of a draft study protocol (objectives, methods, endpoints, analysis plan), critical evaluation of the selected publication from a methodological perspective, development of a mini-project plan (schedule, risks, data quality control) and a short speech in a foreign language presenting the project assumptions.

COURSE ASSESSMENT CRITERIA

Semester I (ZO1): passing with assessment based on a colloquium/test and assessment of a practical task (e.g. formulation of the research question and objectives, preliminary selection of the study design).

Semester II (E2): examination (oral or written) covering topics from the entire subject and submitting and discussing a draft of the research protocol (including objectives, hypotheses, methods, analysis plan, data management plan).

The evaluation criteria take into account: methodological correctness, logical consistency of the project, ability to critically evaluate the literature, reliability and compliance with ethical principles, and activity in discussions.

TOTAL PhD STUDENT WORKLOAD REQUIRED TO ACHIEVE THE INTENDED LEARNING OUTCOMES – NUMBER OF HOURS AND ECTS CREDITS

Activity	Number of hours
Scheduled course contact hours	2 x 30 hrs. – 60 hrs.
Other contact hours involving the teacher (consultation hours, examinations)	6
Non-contact hours – student`s own work (preparation for classes or examinations, project, etc.)	114 hrs
Total number of hours	180 hrs.
Total number of ECTS credits	6 ECTS

INSTRUCTIONAL MATERIALS

Compulsory literature:	<ul style="list-style-type: none"> - Hulley SB, Cummings SR, Browner WS, Grady DG, Newman TB. Designing Clinical Research. Wolters Kluwer. - Friedman LM, Furberg CD, DeMets DL, Reboussin DM, Granger CB. Fundamentals of Clinical Trials. Springer. - Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. Wolters Kluwer. - Altman DG. Practical Statistics for Medical Research. Chapman & Hall/CRC. - ICMJE. Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals.
Complementary literature:	<ul style="list-style-type: none"> - Declaration of Helsinki (WMA) and national/university regulations on research involving human participants. - Reporting guidelines: CONSORT, STROBE, PRISMA, STARD (depending on study type). - COPE. Guidelines on publication ethics. - Training materials and current articles discussed in class (selected for doctoral students' projects).

*(1 ECTS CREDIT CORRESPONDS TO 25 - 30 HOURS OF THE TOTAL WORKLOAD OF A DOCTORAL STUDENT, NEEDED TO ACHIEVE THE ESTABLISHED EFFECTS).

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Date and signature of the Course lecturer

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Approved by the Head of the Department or an authorised person