JAGIELLONIAN UNIVERSITY
MEDICAL COLLEGE

Study programme

Organizational unit: Doctoral School of Medical and Health Sciences

Programme: Interdisciplinary program in Medical and Health Sciences

Level of study: Doctoral School

Academic year: 2025/26

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Education program at the Doctoral School of Medical and Health Sciences

Basic assumptions of the education program:

1. Educational program at the Doctoral School of Medical and Health Sciences (DS) was developed in accordance with the Act of July 20, 2018, Law on Higher Education and Science and the guidelines applicable at the Jagiellonian University in Krakow.
2. Education at DS lasts 8 semesters and is based on the Education Program (EP) and the Individual Research Plan (IRP).
3. Education at DS is offered within the disciplines in which the Jagiellonian University Medical College is authorized to award doctoral degrees.
4. The rules for submitting the IRP and changing it are specified in the DS Regulations.
5. The DS education program leads to the achievement of learning outcomes for qualifications at level 8 of the Polish Qualifications Framework.
6. EP is interdisciplinary in nature, covering the discipline of medical sciences, the discipline of pharmacology and pharmacy sciences and the discipline of health sciences. Individual disciplines are represented in EP in the form of educational paths chosen by the doctoral student.
7. The doctoral student follows the EP path consistent with the scientific discipline in which the doctoral thesis is being carried out. The selection of optional subjects within the EP path takes place before the start of the 2nd year of education.
8. Information regarding individual EP subjects is included in the course syllabus.
9. The languages in which the EP is conducted are Polish and English. The language of teaching in a given subject is determined by the syllabus.
10. Completion of the subject in English requires the doctoral student to present a document confirming knowledge of English at the B2 level or obtaining credit for the subject "English in medical scientific research" at the B2 level of language education, conducted in the first year of education at DS. Documents confirming knowledge of English at CEFR level B2 are: IETLS Academic and General Training certificate – min. 5.5 points or TOEFL iBT min. 72 points or Cambridge Assessment English B2 First or higher – min. 160 points. The exam date cannot be earlier than 4 years before the start of education. A doctoral student who is a citizen of a country where English is the main official language or who is a graduate of a university in a country where English is the main official language is exempt from the need to present a document confirming knowledge of English.
11. The education program is managed by the EP Head.
12. Doctoral students in particular disciplines are supervised by EP path coordinators appointed by the DS Director in consultation with the DS Council and the Jagiellonian University Doctoral Students' Association. EP path coordinators work in cooperation with the EP Head.
13. The number of ECTS points assigned to the program is a minimum of 40 ECTS.
14. A doctoral student may pursue electives in other doctoral schools of the Jagiellonian University, apart from the Jagiellonian University Medical College, in a number not exceeding 3 ECTS points.
15. Detailed requirements and qualification criteria for the educational program are specified in the regulations regarding the Rules of Recruitment to DS approved by the Senate of the Jagiellonian University.
16. In justified cases, a doctoral student may apply to the Director of DS for an individual course of study. The conditions for applying for an individual course of education will be determined by the Director of DS in the form of an ordinance published on the DS website.

Method of assessing the implementation of the education program:

1. Supervision over the EP and IRP activities carried out by the doctoral student is provided by the PhD supervisor.
2. The implementation of the IRP is subject to periodic evaluation by the doctoral committee and, if it is not appointed, by the evaluation team consisting of the supervisor or supervisors and the EP track coordinator and the Head of the EP, based on the report submitted by the doctoral student. If the EP track coordinator or the Head of the EP is also the PhD student's supervisor, the report is additionally approved by the DS Director. If the function of the EP Head is held by a person who is also the Director of DS, in the situation referred to in the preceding sentence, the report is approved by the Chairman of the DS Council. The report template is specified by the DS Director in the form of a message published on the DS website.
3. The first assessment is carried out no later than 12 months from the start of education. Subsequent evaluations are carried out at least once every 12 months on the dates specified in the IRP, except for the year in which the mid-term evaluation is carried out.
4. The Head of the EP, at the request of the doctoral student, based on the opinion of the PhD Supervisor or PhD Supervisors, taking into account the opinion of the members of the Doctoral Committee in the event of its appointment, may make a decision on the acceptance of courses or classes not specified in the EP as part of the doctoral student's duties (with the appropriate allocation of ECTS points).
5. The method of conducting the mid-term evaluation is specified in the DS Regulations.
6. Completion of the year of education is based on the obtained credits for compulsory subjects and the submitted report on the implementation of the IRP referred to in section 2. If the compulsory subjects are not passed for a maximum of 3 ECTS, it is permissible to apply to the Director of DS for conditional registration for the next year of education, with the obligation to complete the subject in the next year of education.
7. Completion of the educational program is based on: obtaining credit for all compulsory subjects, obtaining by the doctoral student at least 40 ECTS points, credit for a research internship, credit for professional practice in higher education teaching.

8. Education at DS ends with the submission of a doctoral dissertation. Submitting a doctoral dissertation is possible at the earliest after a positive result of the mid-term evaluation.

Acquired competences:

As part of participation in the DS, the doctoral student acquires the following competences:

1. competences covering advanced theoretical issues specific to the scientific profile of DS and methodological competences preparing to conduct and publish scientific research;
2. academic competences (e.g. scientific publications, scientific communication, obtaining funds for research, ethics of conducting scientific research, popularization of scientific research results, etc.);
3. professional competences and soft competences (e.g. career planning, preparation for teaching work, project management, managerial competences, business communication, etc.).

Description of the Education Program:

The DS of Medical and Health Sciences Education Program includes:
Compulsory subjects (part of the obligations from which the doctoral student obtains a total of 24 ECTS points, including the obligation to complete one subject in the field of research methodology and ethics (for at least 2 ECTS) and advanced biostatistical methods (for at least 2 ECTS).);
Specialized subjects in the field of scientific research methodology in a given scientific discipline (optional classes, the doctoral student is obliged to choose subjects worth a minimum of 4 ECTS points in total) and workshops with
a supervisor in an appropriate scientific discipline, a total of 6 ECTS points);
Subjects related to additional vocational education and soft skills (optional classes, the doctoral student is obliged to choose subjects worth a minimum of 2 ECTS points in total).

If a doctoral dissertation is submitted before the 8th semester of education, it is permissible to take an additional
2 ECTS points from optional subjects for each year of education instead of completing the "Individual workshops with a supervisor" course in the 3rd or 4th year of education.

A mandatory course is introduced into the Doctoral School Education Program research internship, at least two weeks, conducted at the foreign center or national centre with international recognition. . The internship will be carried out after evaluation mid-term. After consultation with the PhD Supervisor, the PhD student independently applies to a research center and applies for financial support for the trip under available programs implemented by the Jagiellonian University under bilateral or other agreements programs, including Erasmus Plus. The conditions for completing the research internship will be determined by the Director after receiving the opinion of the DS Council.

Effects

Knowledge

General

PhD student knows and understands:

Code	Contents	PRK
SD_W01	PhD student knows and understands a scientific research methodology covering theoretical foundations and general issues related to the represented discipline of medical and health sciences taught at the doctoral school.	P8S_WG
SD_W02	PhD student knows and understands scientific research methodology covering selected detailed issues relevant to the discipline in which the doctoral dissertation is prepared to the degree that allows for a revision of the existing paradigms.	P8S_WG
SD_W03	PhD student knows and understands economic, legal and ethical determinants of research activity and its aspects.	P8S_WK
SD_W04	PhD student is familiar with the knowledge transfer and commercialization of research results.	P8S_WK
SD_W05	PhD student has basic knowledge of acquiring research projects: sources of funding and current procedures (application for grants, evaluation of applications).	P8S_WG
SD_W06	PhD student knows and understands the rules for scientific results dissemination, also in the open-access mode, and the basic principles for the knowledge transfer to the economic and social sphere, including the basic principles for the commercialization of scientific research activity and know-how related to these results.	P8S_WK
SD_W07	PhD student knows and understands modern concepts, methods and tools for teaching or training activity.	P8S_WK
SD_W08	PhD student knows and understands global achievements, including theoretical foundations, general issues and selected specific issues related to the discipline in which the doctoral dissertation is prepared.	P8S_WG
SD_W09	PhD student knows and understands the main development trends of scientific disciplines crucial for education in medical and health sciences.	P8S_WG
SD_W10	PhD student knows and understands selected paradigms in the field of science in which the doctoral programme is carried out.	P8S_WG
SD_W11	PhD student knows and understands basic rights and responsibilities in the field of health and safety in education and the rules applicable during classes	P8S_WK
SD_W12	PhD student knows and understands rules of safe conduct at the scene of an incident, including basic cardiopulmonary resuscitation and handling of an unconscious person	P8S_WK

Skills

General

PhD student can:

Code	Contents	PRK
SD_U01	PhD student using his/her knowledge can critically analyze and evaluate the results of scientific research achievements in the discipline represented and his/her contribution to its development; can formulate new solutions to problems within established and modified methodological paradigms; can creatively apply and develop methods, techniques and research tools appropriate for the conducted research; is able to make conclusions based on scientific research results.	P8S_UW
SD_U02	PhD student can disseminate or transfer the results of scientific activities also in popular forms.	P8S_UK
SD_U03	PhD student can prepare an application for funding of a research project.	P8S_UW
SD_U04	PhD student can speak a modern foreign language to the degree that enables participation in an international scientific and professional environment, in particular in connection with the involvement in conferences, seminars, workshops, etc., at home and abroad; can establish contacts for the exchange of experience and communicate on specialist topics at the B2 level of the Common European Framework of Reference for Languages, with specialists in his/her scientific and professional discipline, as well as with people from outside these environments.	P8S_UK
SD_U05	PhD student can plan and implement an individual or team research or creative project, also in an international environment.	P8S_UO
SD_U06	PhD student can document and present research work results and prepare scientific publications, respecting applicable principles and intellectual property protection rules.	P8S_UW
SD_U07	PhD student can participate in the scientific discourse and initiate a debate.	P8S_UK
SD_U08	PhD student can independently plan and act for his/her own scientific and professional development as well as inspire and organize the development of other people.	P8S_UU
SD_U09	PhD student can develop and give classes within his/her scientific and professional activity and use modern methods and tools.	P8S_UU
SD_U10	PhD student can transfer the results of research work into the economic and social sphere; can analyze the potential for sharing research results to the economic and social sphere and initiate actions to implement such transfer.	P8S_UW
SD_U11	PhD student can define the purpose and subject-matter of the research, formulate a research hypothesis, develop methods, techniques and research tools and apply them creatively based on the research results.	P8S_UW
SD_U12	PhD student using his/her knowledge can critically analyze and evaluate research results, expert activities and other creative works and their contribution to the knowledge development.	P8S_UW
SD_U13	PhD student can use knowledge from a given scientific discipline to creatively identify, formulate and innovatively solve complex problems or perform research tasks.	P8S_UW
SD_U14	PhD student can critically refer to the current state of research in the discipline in which his/her doctoral project is implemented.	P8S_UW
SD_U15	PhD student is able identify potential threats to life and health during and outside of classes and behave adequately to the threat	P8S_UO
SD_U16	PhD student is able avoid endangering your own health and assess your own abilities when administering first aid	P8S_UO
SD_U17	The doctoral student can use a modern foreign language to the extent that enables effective communication in everyday life in written and spoken form.	P8S_UK

Social competence

General

PhD student is ready to:

Code	Contents	PRK
SD_K01	PhD student is ready for a critical evaluation of his/her scientific achievements and expert activities within the discipline in which the doctoral dissertation is prepared.	P8S_KK
SD_K02	PhD student is ready for a critical assessment of his/her contribution to developing the scientific discipline in which the doctoral dissertation is prepared.	P8S_KK
SD_K03	PhD student can define the role of methodological paradigms of his/her discipline and the disciplines in solving social problems.	P8S_KO
SD_K04	PhD student can identify the need to formulate new research paradigms within the discipline in which is his/her doctoral project is implemented.	P8S_KR
SD_K05	PhD student is ready to fulfil social obligations of researchers and creators and initiate public interest activities by properly disseminating information and opinions on scientific achievements to the public, training specialists, and other activities leading to the development of a knowledge-based society.	P8S_KO
SD_K06	PhD student is ready to think and act in an enterprising way, creating new ideas and seeking innovative solutions with representatives of other disciplines; is prepared for intellectual challenges in scientific/professional and public sphere and taking responsibility for his/her decisions.	P8S_KO
SD_K07	PhD student is ready to maintain and develop the ethos of research and creative environments, including independent researching, taking into account i.a. existing financial and infrastructural constraints; is prepared to respect the principle of public ownership of research results together with the principles of intellectual property protection.	P8S_KR
SD_K08	PhD student can recognize the importance of knowledge from other disciplines and domains (other than that the one in which the doctoral programme is implemented) in addressing cognitive and practical problems.	P8S_KR
SD_K09	PhD student is ready to take into account in his/her research the solutions proposed by other disciplines of knowledge.	P8S_KR
SD_K10	PhD student is ready to compliance with legal regulations in the field of health and safety in education and the need to update them due to the changing legal status	P8S_KO
SD_K11	PhD student is ready to comply with the rules of health and safety of education during and outside of classes, help other people and be responsible for their own life and health and that of others	P8S_KO

Plan

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Research methods	seminar: 20	2	graded credit	obligatory	1	SD_W01, SD_W06, SD_U01, SD_U11, SD_U06, SD_U08, SD_K09, SD_K01, SD_K02
Ethics of research with human participants in Biomedicine	seminar: 12	1	graded credit	obligatory	1	SD_W03, SD_U12, SD_K05
Effective teaching of medical education at a university	seminar: 5 classes: 10	1	graded credit	obligatory	1	SD_W07, SD_W11, SD_U09, SD_U08, SD_K10
English in biomedical research B2	foreign language course: 15 e-learning foreign language course: 15	2	graded credit	obligatory	1 2	SD_W08, SD_U04, SD_U17, SD_K01
Individual workshops with the Promotor	seminar: 30	2	credit	obligatory	1 2	SD_W01, SD_W03, SD_U11, SD_K01
Training in health and safety education	lecture: 6	0	credit	obligatory	1	SD_W11, SD_W12, SD_U15, SD_U16, SD_K10, SD_K11
Applying for funding for a research project	seminar: 24 workshop: 6	3	graded credit	obligatory	2	SD_W03, SD_U03, SD_U08, SD_U01, SD_K01, SD_K02, SD_K05, SD_K07, SD_K09
Biostatistics	classes: 25	3	graded credit	obligatory	2	SD_W01, SD_W06, SD_U01, SD_U06, SD_K01, SD_K02, SD_K08, SD_K09
Presentation of own research results	lecture: 5 workshop: 10	1	graded credit	obligatory	3	SD_W04, SD_W06, SD_W07, SD_W08, SD_U01, SD_U02, SD_U04, SD_U07, SD_U12, SD_K02, SD_K03, SD_K05
Scientific writing	seminar: 15	1	graded credit	obligatory	3	SD_W06, SD_W01, SD_W03, SD_W05, SD_U06, SD_U01, SD_U03, SD_U04, SD_U07, SD_K01, SD_K06, SD_K07, SD_K04
Professional training in medical Didactics	professional practice: 60	2	credit	obligatory	3 4 5 6	SD_W07, SD_U08, SD_U09, SD_K05
Current achievements in medical and health sciences	e-learning lecture: 6 e-learning seminar: 14	2	graded credit	obligatory	3 4	SD_W08, SD_W10, SD_W09, SD_U01, SD_K08
Protection of intellectual property. Patent and implementation rules	e-learning seminar: 8 e-learning lecture: 2	1	graded credit	obligatory	4	SD_W04, SD_W06, SD_W03, SD_U01, SD_U06, SD_U10, SD_U11, SD_K06, SD_K07

1st Group Complementary training in professional and soft skills 1st year

A PhD student is required to choose subject for a minimum of 1 ECTS.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Introduction to R-programming	classes: 30	2	graded credit	elective	1 2	SD_W06, SD_U06, SD_U09, SD_K08
A critical review of the literature	seminar: 15	1	graded credit	elective	2	SD_W02, SD_U01, SD_U12, SD_U14, SD_U13, SD_U07, SD_K01, SD_K02
Activities of university and non-university research centres	lecture: 6 seminar: 24	1	graded credit	elective	2	SD_W08, SD_W03, SD_W09, SD_U12, SD_U13, SD_U11, SD_K08, SD_K09
Systematic reviews	seminar: 6 workshop: 9	2	graded credit	elective	2	SD_W02, SD_U01, SD_K02

2nd Group Methods and ethics of research

A PhD student is required to choose subjects one of three.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Methods and ethics of research in humans	seminar: 18	2	graded credit	elective	2	SD_W01, SD_W02, SD_U01, SD_U11, SD_U05, SD_K08
Methods and ethics of research in animals	seminar: 18	2	graded credit	elective	2	SD_W03, SD_U02, SD_U09, SD_U05, SD_K04
Methods and ethics of health care system research	seminar: 18	2	graded credit	elective	2	SD_W03, SD_W01, SD_U01, SD_U05, SD_U11, SD_U12, SD_U14, SD_K03, SD_K04

3rd Group Advanced methods in biostatistics

A PhD student is required to choose subjects one of four.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Regression models in biomedical science	classes: 20	2	graded credit	elective	3	SD_W01, SD_W09, SD_U01, SD_U13, SD_U06, SD_U11, SD_K01, SD_K08, SD_K09

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Multidimensional models in data analysis	classes: 20	2	graded credit	elective	3	SD_W01, SD_W09, SD_U01, SD_U06, SD_U11, SD_K06, SD_K08, SD_K09
Linear model in experimental setup	classes: 20	2	graded credit	elective	3	SD_W01, SD_W02, SD_W09, SD_U01, SD_U06, SD_K08, SD_K09
Statistical methods for practical management of omics data	classes: 20	2	graded credit	elective	3	SD_W01, SD_U11, SD_K08

Complementary training in professional and soft skills 3rd year

A PhD student is required in the third year to choose subjects for a minimum of 1 ECTS.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Basics of interpersonal communication	seminar: 10 workshop: 5	1	graded credit	elective	5	SD_W09, SD_U13, SD_K08
Media in scientific work	classes: 10	1	credit	elective	5	SD_W06, SD_U02, SD_K05
Science publications; submission for printing, sharing and popularization	seminar: 5 classes: 5	1	graded credit	elective	5	SD_W06, SD_W04, SD_U06, SD_U02, SD_U10, SD_K05
The lifecycle of a publication; from submission to open science and to promotion	seminar: 15 workshop: 15	2	graded credit	elective	5	SD_W06, SD_W08, SD_W09, SD_W10, SD_U02, SD_U05, SD_U06, SD_K07, SD_K08, SD_K09
English in biomedical research C1	foreign language course: 15 e-learning foreign language course: 15	2	graded credit	elective	5 6	SD_W08, SD_U04, SD_U17, SD_K01
Subgroup Second foreign language	foreign language course: 30	2	graded credit	elective	5 6	
Spanish language	foreign language course: 30	2	graded credit	elective	5 6	SD_W01, SD_U04, SD_U17, SD_K01
German language	foreign language course: 30	2	graded credit	elective	5 6	SD_W01, SD_U17, SD_K02
French language	foreign language course: 30	2	graded credit	elective	5 6	SD_W01, SD_U04, SD_U17, SD_K01
Principles of the international cooperation in scientific projects	seminar: 25 workshop: 5	2	graded credit	elective	6	SD_W03, SD_W04, SD_W05, SD_W07, SD_U03, SD_U04, SD_U05, SD_K08
Academic entrepreneurship	lecture: 6 seminar: 4	1	graded credit	elective	6	SD_W04, SD_W06, SD_U02, SD_U08, SD_U10, SD_K06
Artificial intelligence in medical sciences	seminar: 10	1	graded credit	elective	6	SD_W01, SD_W02, SD_U01, SD_K04

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
New medical technologies and philosophy	lecture: 2 seminar: 8	1	graded credit	elective	6	SD_W01, SD_W02, SD_W03, SD_W08, SD_U01, SD_U02, SD_U03, SD_U05, SD_U06, SD_U07, SD_U08, SD_U09, SD_U11, SD_U12, SD_U10, SD_U13, SD_U14, SD_K01, SD_K03, SD_K04, SD_K05, SD_K06, SD_K09, SD_K07, SD_K08

Plan - Pharmaceutical sciences

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Individual workshops with the Promotor in pharmaceutical sciences	seminar: 90	6	credit	obligatory	3 4 5 6 7 8	SD_W01, SD_W02, SD_W03, SD_W05, SD_U01, SD_U06, SD_U11, SD_U13, SD_U14, SD_K01, SD_K02, SD_K06
Research internship in pharmaceutical sciences	training: 60	3	credit	obligatory	6	SD_W01, SD_W02, SD_W09, SD_U01, SD_U05, SD_U08, SD_U14, SD_U07, SD_K01, SD_K02, SD_K06, SD_K07

Module in the discipline of pharmaceutical sciences 2nd year

A PhD student is required in the second year to choose subjects for a minimum of 2 ECTS.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Selected drug discovery technologies	seminar: 10 classes: 5	1	graded credit	elective	3	SD_W02, SD_W09, SD_U01, SD_U09, SD_U12, SD_K03
Nature therapy	seminar: 11 classes: 4	1	graded credit	elective	3	SD_W01, SD_W09, SD_W02, SD_W08, SD_W06, SD_W07, SD_U01, SD_U02, SD_U12, SD_U13, SD_U14, SD_U15, SD_K01, SD_K08, SD_K09, SD_K03, SD_K05, SD_K10
Biological and biosimilar medications. Generic medications	seminar: 13 classes: 2	1	graded credit	elective	4	SD_W01, SD_W03, SD_U01, SD_K01, SD_K08
Modern methods of optimizing drug dosing in subpopulations	classes: 8 e-learning seminar: 7	1	graded credit	elective	4	SD_W01, SD_W02, SD_W08, SD_W09, SD_U01, SD_U12, SD_U13, SD_U14, SD_K01, SD_K04, SD_K06, SD_K08

Module in the discipline of pharmaceutical sciences 3rd year

A PhD student is required in the third year to choose subjects for a minimum of 2 ECTS.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Selected aspects of pharmocotherapy safety	classes: 7 seminar: 4 e-learning seminar: 2 e-learning classes: 2	1	graded credit	elective	5	SD_W01, SD_W08, SD_W02, SD_U01, SD_U14, SD_U12, SD_U07, SD_K09, SD_K08
Drug, food interactions, clinical aspects	seminar: 10 classes: 5	1	graded credit	elective	6	SD_W09, SD_W01, SD_U01, SD_U12, SD_U02, SD_K05
Bioinformatics databases in pharmaceutical sciences	seminar: 3 classes: 12	1	graded credit	elective	6	SD_W02, SD_U01, SD_K06

Plan - Medical sciences

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Individual workshops with the Promotor in medical sciences	seminar: 90	6	credit	obligatory	3 4 5 6 7 8	SD_W01, SD_W02, SD_W03, SD_W05, SD_U01, SD_U06, SD_U11, SD_U13, SD_U14, SD_K01, SD_K02, SD_K06
Research internship in medical sciences	training: 60	3	credit	obligatory	6	SD_W01, SD_W02, SD_W09, SD_U01, SD_U05, SD_U08, SD_U14, SD_U07, SD_K01, SD_K02, SD_K06, SD_K07

Module in the discipline of medical sciences 2nd year

A PhD student is required in the second year to choose subjects for a minimum of 2 ECTS.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Regenerative medicine from the bench to the bedside	seminar: 18 workshop: 12	2	graded credit	elective	3	SD_W01, SD_W09, SD_U13, SD_K08
Medical techniques in biomedicine	e-learning seminar: 15	1	graded credit	elective	4	SD_W01, SD_U01, SD_K01

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Imaging methods in medical sciences	seminar: 12 workshop: 3	1	graded credit	elective	4	SD_W01, SD_W02, SD_W03, SD_U01, SD_U02, SD_K01, SD_K02, SD_K03

Module in the discipline of medical sciences 3rd year

A PhD student is required in the third year to choose subjects for a minimum of 2 ECTS.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Imaging and biochemical biomarkers in clinical research	seminar: 15	1	credit	elective	5	SD_W02, SD_W08, SD_W10, SD_U05, SD_U12, SD_K01
Cognitive neuroscience	seminar: 10 classes: 20	2	graded credit	elective	6	SD_W01, SD_W04, SD_W06, SD_U01, SD_U02, SD_U07, SD_K08, SD_K09
Clinical psychology	seminar: 10 workshop: 5	1	graded credit	elective	6	SD_W09, SD_U13, SD_K08

Plan - Health sciences

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Individual workshops with the Promotor in health sciences	seminar: 90	6	credit	obligatory	3 4 5 6 7 8	SD_W01, SD_W02, SD_W03, SD_W05, SD_U01, SD_U06, SD_U11, SD_U13, SD_U14, SD_K01, SD_K02, SD_K06
Research internship in health sciences	training: 60	3	credit	obligatory	6	SD_W01, SD_W02, SD_W09, SD_U01, SD_U05, SD_U08, SD_U14, SD_U07, SD_K01, SD_K02, SD_K06, SD_K07

Module in the discipline of health sciences 2nd year

A PhD student is required in the second year to choose subjects for a minimum of 2 ECTS.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Methods of epidemiological studies	seminar: 15	1	graded credit	elective	3	SD_W01, SD_W02, SD_U05, SD_U11, SD_K03

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Organization and financing of health care in Poland	seminar: 6 e-learning seminar: 9	1	credit	elective	4	SD_W02, SD_W08, SD_U07, SD_U14, SD_K08, SD_K09
Non-invasive biomarkers in human health studies	seminar: 15	1	graded credit	elective	4	SD_W01, SD_W07, SD_W08, SD_U01, SD_U07, SD_U11, SD_U12, SD_U13, SD_U14, SD_U04, SD_K05, SD_K07, SD_K08, SD_K10

Module in the discipline of health sciences 3rd year

A PhD student is required in the third year to choose subjects for a minimum of 2 ECTS.

Name	Type of classes	ECTS	Examination method	Mandatory	Semester	Learning outcomes
Exercise physiology and its importance in medicine and rehabilitation	seminar: 16	1	graded credit	elective	5	SD_W08, SD_W10, SD_W09, SD_U13, SD_U14, SD_U11, SD_K08, SD_K09
Research determinants in selected areas of health sciences	seminar: 15	2	graded credit	elective	5	SD_W01, SD_W02, SD_W09, SD_W08, SD_W06, SD_U01, SD_U05, SD_U06, SD_K01, SD_K02, SD_K06
European Health Systems	e-learning seminar: 5 e-learning classes: 10	1	graded credit	elective	6	SD_W08, SD_U07, SD_U12, SD_U14, SD_K08

Syllabuses

Research methods
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory obligatory	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 1	Examination graded credit **Activities and hours** seminar: 20	Number of ECTS points 2.0

Goals

C1	To familiarize PhD students with the methodology of scientific work and typology of scientific research.
C2	To prepare PhD students to comprehensive search for sources of knowledge and use of scientific information resources and services offered by the Medical Library and available throughout the Jagiellonian University network.
C3	To familiarize PhD students with principles of developing bibliometric analyses, and thus equipping them with the knowledge and skills to prepare an independent assessment of their own publication achievements

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	the rules of conducting the scientific research;	SD_W01	project, assignment report
W2	principles of research goals and hypotheses adequate to the research problem;	SD_W01	project, assignment report
W3	The quantitative study - choice of the study design, the rules of condacting the study;	SD_W01	project, assignment report
W4	selection of the study participants	SD_W01	project, assignment report
W5	typology of potential errors in the study plan and their impact on the results;	SD_W01	project, assignment report
W6	principle of the reasoning about causation;	SD_W01	project, assignment report
W7	principles of conducting the qualitative research;	SD_W01	project, assignment report
W8	principles of publishing the results of scientific activities, including the principles of open access to scientific publications and research data, types and types of publications, and the importance, role and use of bibliometric indicators;	SD_W06	practical test
W9	principles of ofunctioning of multi-disciplinary and specialized reference databases of knowledge resources and scientific information tools.	SD_W06	practical test
Skills – PhD student can:			
U1	to define the aim and hypothesis;	SD_U01, SD_U11	project, assignment report
U2	to chose the proper study design to the specific research problem;	SD_U01, SD_U11	project, assignment report
U3	to chose the inclussion and exclussion criteria and to propose sampling procedure;	SD_U01, SD_U11	project, assignment report
U4	to propose methods and tools appropriate to solve the specific research problem and taking into accoun their reliability;	SD_U01, SD_U11	project, assignment report
U5	to indicate potencial sources of error in the study protocol and to propose how to minimalize them;	SD_U01, SD_U11	project, assignment report
U6	to chose the proper qualitative study;	SD_U01, SD_U11	project, assignment report
U7	to build search strategies, including analysis of the topic in detail and recording the results of information queries, and using bibliographic reference management systems;	SD_U06	practical test
U8	to share the results of their research activities with other scientists and the socio-economic environment by using appropriate Open Science licenses, depositing publications and research data in repositories and participating in the processes of evaluation of their own scientific achievements.	SD_U08	practical test
Social competences – PhD student is ready to:			
K1	take into account the achievements of other scientific fields in its activities;	SD_K09	project, assignment report

Code	Outcomes in terms of	Effects	Examination methods
K2	critical assessment of scientific achievements and expert activity within the scientific discipline in which the doctoral dissertation is prepared;	SD_K01	practical test, assignment report
K3	critical assessment of one's own contribution to the development of the scientific discipline in which the doctoral dissertation is prepared.	SD_K02	practical test, assignment report

Calculation of ECTS points

Activity form	Activity hours*
seminar	20
preparation for classes	5
independent education	25
preparation of a project	5
consultations with lecturer	5
PhD student workload	**Hours** 60
Workload involving teacher	**Hours** 20

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Research methodology as a science. Goals, aims and hypotheses.	W1, W2, U1	seminar
2.	The parts of thee research protocol. Choice of the study design the most suited for the research problem.	W1, W3, U2	seminar
3.	Population - selection criteria, the sampling methods;	W1, W4, U3	seminar
4.	Qualitative study. The examples of using qualitative design in research.	W1, W7, U6	seminar
5.	Research methods and tools;	W1, W3, U4, K1	seminar
6.	The potential sources of error in the study. Causality assessment.	W5, W6, U4, U5, K1	seminar

No.	Course content	Subject's learning outcomes	Activities
7.	Bibliometric issues: recognizing types and classifying scientific publications, types of bibliometric indicators - meaning, importance and application, importance of bibliometric issues in order to critically evaluate scientific achievements and one's own contribution to the development of the represented scientific discipline 1. Bibliography of the Jagiellonian University Collegium Medicum 2. Web of Science 3. Scopus 4. Journal Citation Reports	W8, W9, K2, K3	seminar
8.	The most important databases - information search processes (formulating questions, building a search strategy, using filters and checklists, ways of documenting searches, how to find the necessary journal and reach the full text of the article, the issue of Open Access - open access to scientific content): 1. Pubmed 2. UpToDate 3. Embase 4. The Cochrane Library 5. ClinicalKey Student	W8, W9, U7, U8, K2, K3	seminar
9.	Bibliography management systems supporting the process of editing scientific publications (easy insertion of citations and generating bibliographies according to various publishing requirements, automatic collection of references from databases, library catalogues, websites, online cooperation with other scientists, transferring content from other bibliography managers, suggesting important publications based on current library content) - Mendeley and EndNote.	W8, W9, U7, K2, K3	seminar

Course advanced

Teaching methods :

computer classes, discussion, problem solving method, group work, assignments solving, seminar, workshop, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
seminar	project, practical test, assignment report	Credit for the methodology part is based on the implementation of tasks assigned during classes and the final project. Credit for the bibliometrics module requires completing a test checking practical skills - open questions. To pass the course PhD student has to obtain at least 60% of the maximum number of points for each activity (separatelly). The student is obliged to actively participate in classes.

Additional info

During each class, the student completes tasks assigned by the teacher - graded 0-100%. Completing a given task requires obtaining at least 60% on a given task. At the end of the course, students prepare a research plan on a given topic. Scoring

0-100% according to the previously provided grading scheme, minimum score of 60% is required.During the bibliometric part of the course student is obliged to pass the test (open quastions) and to receive at least 60% of the maximum number of points.

The final number of points is calculated as the average of the scores for the tasks (average of all tasks), bibliometric test and the final project.

Grading scale : 92.0-100.0   - very good (5.0) 84.0-91.9   - good plus (4.5) 76.0 – 83.9   – good (4.0) 68.0 – 75.9   - satisfactory plus (3.5) 60.0 – 67.9   – satisfactory (3.0) <60.0   - unsatisfactory (2.0)

Assessment in the second term is carried out according to the same rules. As part of your own work student should: read the obligatory literature.

Entry requirements

Basic skill of using computer techniques.

Linking with research conducted at the university

Examples of research stuies conducted in Chair of Epidemiology and Preventive Medicine:

- "Badania nad wpływem zanieczyszczenia powietrza na zdrowie oraz korzyściami płynącymi z polityki poprawy jakości powietrza atmosferycznego w Krakowie" - the project with Columbia University, New York; principal investigator for the Polish part dr hab. Agnieszka Pac (2015-2021)
- Environmental Health Research in Poland: Preventing Risk to Children From Environmental Exposures and Air Pollution - - the project with Columbia University, New York; principal investigator for the Polish part dr hab. Agnieszka Pac (2021)
  EXPANSE: EXposome Powered tools for healthy living in urbAN Settings - Horizon2020; partner from JU" dr hab. Agnieszka Pac (2020-2024)

Chosen publications:
1. Vernooij RWM, Zeraatkar D, Han MA, El Dib R, Zworth M, Milio K, Sit D, Lee Y, Gomaa H, Valli C, Swierz MJ, Chang Y, Hanna SE, Brauer PM, Sievenpiper J, de Souza R, Alonso-Coello P, Bala MM, Guyatt GH, Johnston BC. Patterns of Red and Processed Meat Consumption and Risk for Cardiometabolic and Cancer Outcomes: A Systematic Review and Meta-analysis of Cohort Studies. Ann Intern Med. 2019 Nov 19;171(10):732-741. doi: 10.7326/M19-1583. Epub 2019 Oct 1.
2. Pac A, Tobiasz-Adamczyk B, Błędowski P, Skalska A, Szybalska A, Zdrojewski T, Więcek A, Chudek J, Michel JP, Grodzicki T. Influence of Sociodemographic, Behavioral and Other Health-Related Factors on Healthy Ageing Based on Three Operative Definitions. J Nutr Health Aging. 2019;23(9):862-869. doi: 10.1007/s12603-019-1243-5.

Ethics of research with human participants in Biomedicine
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Mandatory
obligatory

Disciplines
Medical science, Pharmaceutical science, Health science

ISCED classification
0917 Traditional and complementary medicine and therapy

Didactic cycle
2025/26

Realization year
2025/26

Lecture languages
polish, english

Block
obligatory for passing a year

Examination
graded credit

Period	Examination	Number of ECTS points
Semester 1	graded credit **Activities and hours** seminar: 12	1.0

Goals

C1	To foster the ability to identify ethic issues in biomedical research with human participants
C2	To raise awareness of importance of research data for economy, social and knowledge progression.
C3	To teach practical skills in project design and realization based on principles of Responsible Conduct of Research

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	PhD student knows and understands economic, legal and ethical determinants of research activity and its aspects	SD_W03	written credit

Code	Outcomes in terms of	Effects	Examination methods
Skills – PhD student can:			
U1	PhD student using his/her knowledge can critically analyze and evaluate the results of scientific research achievements in the discipline represented and his/her contribution to its development; can formulate new solutions to problems within established and modified methodological paradigms; can creatively apply and develop methods, techniques and research tools appropriate for the conducted research; is able to make conclusions based on scientific research result	SD_U12	written credit
Social competences – PhD student is ready to:			
K1	PhD student is ready to fulfil social obligations of researchers and creators and initiate public interest activities by properly disseminating information and opinions on scientific achievements to the public, training specialists, and other activities leading to the development of a knowledge-based society	SD_K05	written credit

Calculation of ECTS points

Activity form	Activity hours*
seminar	12
preparation for classes	6
preparation for colloquium	8
PhD student workload	**Hours** 26

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Basic biomedical research ethics principles. Definition of vulnerable populations Informed consent and assent for research	W1	seminar
2.	Risk and benefit in research. Justice in research. Data sharing.	U1	seminar
3.	Ethical issues of research with human biological material.\n\nInformed consent and assent for research. Biobanking	K1	seminar

Course advanced

Teaching methods :

case study, discussion

Activities	Examination methods	Credit conditions
seminar	written credit	Full attendance and a written exam 51% passed.

Entry requirements

None.

Linking with research conducted at the university

This course is connected with the project funded by NCN "Patient-centered? Bioethics of adaptive design in clinical trials" 2021/41/B/HS1/01123, PI: Marcin Waligóra and with the project funded by the EC HORIZON 2020, CARTHAGO: Cartilaginous tissue regeneration by gene therapy – Ethical challenges of gene transfer and regenerative medicine nr 955335, PI: Marcin Waligóra.

Effective teaching of medical education at a university
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Mandatory
obligatory

Disciplines
Medical science, Pharmaceutical science, Health science

ISCED classification
0114 Teacher training with subject specialisation

Didactic cycle
2025/26

Realization year
2025/26

Lecture languages
polish, english

Block
obligatory for passing a year

Examination
graded credit

Period	Examination	Number of ECTS points
Semester 1	graded credit **Activities and hours** seminar: 5 classes: 10	1.0

Goals

C1	Discussion of the various roles of an academic teacher and the concept of evidence-based medical education (BEME-Best Evidence Medical Education), the AMEE organization, as well as a discussion of the formal and legal aspects of the organization of teaching at medical universities.
C2	Presenting an outcomes-based approach to education. Discussion of the terminology of learning outcomes, Bloom's taxonomy and determining the relationship between learning outcomes, teaching methods and methods of verifying the achievement of learning outcomes. Getting to know the standards of education in medical fields in Poland.
C3	Discussion of formal and legal definitions: curriculum, study program, course syllabus, study regulations. Presentation of the principles of creating a curriculum - the SPICES model. Horizontal, vertical, spiral curriculum integration. Discussion of student-centered approaches, interprofessional education, and curriculum mapping.
C4	Discussion of various forms of teaching, including: teaching in a large group, teaching in a small group (including PBL), teaching in a clinical context, medical simulations, e-learning, peer learning, lifelong learning.
C5	Discussion of the importance of assessment in the teaching process and presentation of the objectives (formative and summative assessment) and various assessment methods selected adequately to the assessed learning outcomes. Assessment mapping (blueprint), using assessment to evaluate the curriculum.
C6	A practical approximation of the Problem Based Learning method.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	roles of an academic teacher	SD_W07	project, test
W2	principles for defining learning outcomes	SD_W07	project, test
W3	principles of creating educational programs	SD_W07	project, test
W4	principles of selecting effective assessment methods	SD_W07	project, test
W5	interactive and small group teaching methods	SD_W07	project, test
W6	basic principles of conducting simulation classes	SD_W07	project, test
W7	rights and obligations in the field of health and safety of education	SD_W11	project, test
Skills – PhD student can:			
U1	prepare classes using modern methods of didactics	SD_U09	project, test
U2	use different methods of evaluation	SD_U09	project, test
U3	define learning outcomes	SD_U09	project, test
U4	plan and act for their own scientific and professional development	SD_U08	project, test
Social competences – PhD student is ready to:			
K1	Compliance with legal regulations in the field of safety and hygiene of education	SD_K10	project, test

Calculation of ECTS points

Activity form	Activity hours*
seminar	5
classes	10
preparation of multimedia presentation	10
preparation for examination	5

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Who is an academic teacher? 12 roles of an academic teacher, evidence-based medical education (BEME-Best Evidence Medical Education), presentation of the AMEE organization and the materials it provides (AMEE Guides). Formal and legal aspects of the organization of didactics at medical universities.	W1, W7, U1, U4	classes, seminar
2.	What should students learn? Introducing an outcomes-based approach to education. Terminology of learning outcomes, Bloom's taxonomy. Relationship between learning outcomes, didactic methods and methods of verification of achievement of learning outcomes. Standards of education for medical faculties in Poland.	W2, U3	classes, seminar
3.	What is a curriculum? Presentation of formal and legal definitions: curriculum, course syllabus, study regulations. Principles of curriculum development - SPICES model. Horizontal, vertical, spiral integration of curriculum. Student-centered approach. Interprofessional education. Curriculum mapping.	W3, U1, U4	classes, seminar
4.	Different forms of teaching. Discuss the basic forms of teaching: large-group teaching, small-group teaching (including PBL), teaching in a clinical context, medical simulation, e-learning, peer teaching, lifelong learning.	W5, W6, K1	classes, seminar
5.	Why is assessment important? The purpose of assessment - formative and summative assessment. Matching the method of assessment to the learning outcome being assessed, Miller's pyramid, Kirkpatric's model. presentation of different methods of assessing knowledge and skills: MCQ, MRQ, SAQ, progress test, OSCE, Mini-CEX, peer assessment. Mapping of assessment (blueprint), use of assessment for curriculum evaluation.	W4, U2	classes, seminar

No.	Course content	Subject's learning outcomes	Activities
6.	Problem Based Learning - Acquisition by participants of the knowledge and skills necessary to independently act as a tutor during classes implemented by the Problem Based Learning (PBL) method.	W5, U1	classes, seminar

Course advanced

Teaching methods :

brainstorm, discussion, group work, seminar

Activities	Examination methods	Credit conditions
seminar	project, test	Class attendance. Knowledge test. Presentation of your course.
classes	project, test	Class attendance. Knowledge test. Presentation of your course.

Linking with research conducted at the university

1. Gaska, K., Pavlinec, C., Cebula, G., Pisarska-Adamczyk, M., & Szopa, M. (2023). Non-technical Skills in Cardiopulmonary Resuscitation: Improvement and Evaluation of a New Course Introduced to the Curriculum at a Medical School in Poland in 2018 to 2019. SAGE Open, 13(4). https://doi.org/10.1177/21582440231205693

2. Elvén M, Welin E, Wiegleb Edström D, Petreski T, Szopa M, Durning SJ, Edelbring S. Clinical Reasoning Curricula in Health Professions Education: A Scoping Review. J Med Educ Curric Dev. 2023 Oct 25;10:23821205231209093. doi: 10.1177/23821205231209093. PMID: 37900617; PMCID: PMC10605682.

3. Borowczyk M, Stalmach-Przygoda A, Doroszewska A, Libura M, Chojnacka-Kuraś M, Małecki Ł, Kowalski Z, Jankowska AK. Developing an effective and comprehensive communication curriculum for undergraduate medical education in Poland - the review and recommendations. BMC Med Educ. 2023 Sep 7;23(1):645. doi: 10.1186/s12909-023-04533-5. PMID: 37679670; PMCID: PMC10486093.

4. Gorski S, Prokop-Dorner A, Pers M, Stalmach-Przygoda A, Malecki Ł, Cebula G, Bombeke K. The Use of Simulated Patients Is more Effective than Student Role Playing in Fostering Patient-Centred Attitudes during Communication Skills Training: A Mixed Method Study. Biomed Res Int. 2022 Dec 17;2022:1498692. doi: 10.1155/2022/1498692. PMID: 36573197; PMCID: PMC9789908.

5. Parodis I, Andersson L, Durning SJ, Hege I, Knez J, Kononowicz AA, Lidskog M, Petreski T, Szopa M, Edelbring S. Clinical Reasoning Needs to Be Explicitly Addressed in Health Professions Curricula: Recommendations from a European Consortium. Int J Environ Res Public Health. 2021 Oct 25;18(21):11202. doi: 10.3390/ijerph182111202. PMID: 34769721; PMCID: PMC8583438.

6. Stalmach-Przygoda A, Nowakowski M, Kocurek A, Perera I, Skrzypek A, Mirecka J, Świerszcz J, Kowalska B, Górski S, Pers M, Cebula G, Szopa M. Perceptions of clinical teachers acting as examiners regarding the value of Objective Structured Clinical Examinations. Folia Med Cracov. 2020 Sep 28;60(2):109-121. doi: 10.24425/fmc.2020.135017. PMID: 33252599.

7. Pers M, Górski S, Stalmach-Przygoda A, Balcerzak Ł, Szopa M, Karabinowska A, Świerszcz J, Perera I, Cebula G. Clinical communication course and other factors affecting patient-centered attitudes among medical students. Folia Med Cracov. 2019;59(2):81-92. PMID: 31659352.

8. Świerszcz J, Stalmach-Przygoda A, Kuźma M, Jabłoński K, Cegielny T, Skrzypek A, Wieczorek-Surdacka E, Kruszelnicka O, Chmura K, Chyrchel B, Surdacki A, Nowakowski M. How does preclinical laboratory training impact physical examination skills during the first clinical year? A retrospective analysis of routinely collected objective structured clinical examination scores among the first two matriculating classes of a reformed curriculum in one Polish medical school. BMJ Open. 2017 Sep 1;7(8):e017748. doi: 10.1136/bmjopen-2017-017748. PMID: 28864488; PMCID: PMC5588968.

English in biomedical research B2
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Mandatory
obligatory

Disciplines
Medical science, Pharmaceutical science, Health science

ISCED classification
0231 Language acquisition

Didactic cycle
2025/26

Realization year
2025/26

Lecture languages
english

Block
obligatory for passing a year

Examination
- graded credit

Period	Examination	Number of ECTS points
Semester 1	- **Activities and hours** foreign language course: 7 e-learning foreign language course: 8	0.0

Period	Examination	Number of ECTS points
Semester 2	graded credit **Activities and hours** foreign language course: 8 e-learning foreign language course: 7	2.0

Goals

C1	The aim of the course is to develop the ability to present English-language articles thematically related with a given discipline and the individual research plan of the student.
C2	The aim of the course is to develop the ability to understand discussions about English-language articles thematically related to a given discipline, and the individual research plan of the student.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The doctoral student knows and understands the world's achievements, including theoretical foundations, general issues and selected detailed issues relevant to the discipline in which the doctoral dissertation is prepared.	SD_W08	classroom observation
Skills – PhD student can:			
U1	The doctoral student is able to use a modern foreign language to the extent that enables them participation in an international scientific and professional environment, in particular in connection with participation in conferences, seminars, workshops, etc. in the country and abroad - establish contacts for the exchange of experiences and communicate on specialist topics on level B2 of the Common European Framework of Reference for Languages, with specialists in their scientific and professional discipline, as well as with people representing other scientific environments.	SD_U04, SD_U17	oral answer
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to critically evaluate the scientific achievements and expert activity within the scientific discipline in which the doctoral dissertation is prepared.	SD_K01	oral answer

Calculation of ECTS points

Semester 1

Activity form	Activity hours*
foreign language course	7
e-learning foreign language course	8
preparation for classes	5
preparation of multimedia presentation	5
independent education	5
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 2

Activity form	Activity hours*

foreign language course	8
e-learning foreign language course	7
preparation of multimedia presentation	5
independent education	5
preparation for classes	5

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	First term · Linguistic resources needed to present a summary of an article. · Basic academic vocabulary. · Topics of abstracts selected by students of doctoral school.	W1, U1, K1	foreign language course, e-learning foreign language course
2.	Second term · Vocabulary needed for participation in conferences · Topics of abstracts selected by students of the doctoral school.	W1, U1, K1	foreign language course, e-learning foreign language course

Course advanced

Semester 1

Teaching methods :

e-learning, foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, oral answer	Graded credit. 1. 2. Assessment of activity during classes made by the instructor. 3. Delivering presentation related to the topic of a doctoral thesis. 4. Attendance at classes. Any absence must be justified and made up in the prescribed manner by the lecturer. The grading scale applies: 0-59 % – fail 60-70 % – sufficient 71-75% - sufficientplus 76-85% – good 86-90 % – good plus 91-100 % –very good Doctoral students with a certificate confirming their knowledge of English at the B2 level may apply for exemption from taking classes. The list of accepted certificates is announced in the form of a statement from the director of the Doctoral School of Medical and Health Sciences and published on the website of the Doctoral School - before the start of classes. Doctoral students have the opportunity to take a B2 level language exam organized by the UJCM Language Center and obtain a certificate.

Activities	Examination methods	Credit conditions
e-learning foreign language course	classroom observation, oral answer	Graded credit. 1. 2. Assessment of activity during classes made by the instructor. 3. Delivering presentation related to the topic of a doctoral thesis. 4. Attendance at classes. Any absence must be justified and made up in the prescribed manner by the lecturer. The grading scale applies: 0-59 % – fail 60-70 % – sufficient 71-75% - sufficientplus 76-85% – good 86-90 % – good plus 91-100 % –very good Doctoral students with a certificate confirming their knowledge of English at the B2 level may apply for exemption from taking classes. The list of accepted certificates is announced in the form of a statement from the director of the Doctoral School of Medical and Health Sciences and published on the website of the Doctoral School - before the start of classes. Doctoral students have the opportunity to take a B2 level language exam organized by the UJCM Language Center and obtain a certificate.

Semester 2

Teaching methods :

e-learning, foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, oral answer	Graded credit. 1. 2. Assessment of activity during classes made by the instructor. 3. Delivering presentation related to the topic of a doctoral thesis. 4. Attendance at classes. Any absence must be justified and made up in the prescribed manner by the lecturer. The grading scale applies: 0-59 % – fail 60-70 % – sufficient 71-75% - sufficientplus 76-85% – good 86-90 % – good plus 91-100 % –very good Doctoral students with a certificate confirming their knowledge of English at the B2 level may apply for exemption from taking classes. The list of accepted certificates is announced in the form of a statement from the director of the Doctoral School of Medical and Health Sciences and published on the website of the Doctoral School - before the start of classes. Doctoral students have the opportunity to take a B2 level language exam organized by the UJCM Language Center and obtain a certificate.
e-learning foreign language course	classroom observation, oral answer	Graded credit. 1. 2. Assessment of activity during classes made by the instructor. 3. Delivering presentation related to the topic of a doctoral thesis. 4. Attendance at classes. Any absence must be justified and made up in the prescribed manner by the lecturer. The grading scale applies: 0-59 % – fail 60-70 % – sufficient 71-75% - sufficientplus 76-85% – good 86-90 % – good plus 91-100 % –very good Doctoral students with a certificate confirming their knowledge of English at the B2 level may apply for exemption from taking classes. The list of accepted certificates is announced in the form of a statement from the director of the Doctoral School of Medical and Health Sciences and published on the website of the Doctoral School - before the start of classes. Doctoral students have the opportunity to take a B2 level language exam organized by the UJCM Language Center and obtain a certificate.

Entry requirements

No requirements

Linking with research conducted at the university

Not applicable

Individual workshops with the Promotor
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Mandatory
obligatory

Disciplines
Medical science, Pharmaceutical science, Health science

ISCED classification
0917 Traditional and complementary medicine and therapy

Didactic cycle
2025/26

Realization year
2025/26

Lecture languages
polish, english

Block
obligatory for passing a year

Examination
- credit

Period	Examination	Number of ECTS points
Semester 1	- **Activities and hours** seminar: 15	0.0

Period	Examination	Number of ECTS points
Semester 2	credit **Activities and hours** seminar: 15	2.0

Goals

C1	The aim of the course is to individually prepare the doctoral student to conduct scientific work, specifically related to the research topic being implemented, which is the basis for the development of the doctoral dissertation.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The doctoral student knows and understands the methodology of scientific research, including theoretical foundations and general issues necessary to implement the research project.	SD_W01	assignment report, oral credit
W2	The doctoral student knows and understands the economic, legal and ethical conditions of research activity and its aspects - to the extent necessary to implement the research project	SD_W03	assignment report, oral credit
Skills – PhD student can:			
U1	The doctoral student is able to define the purpose and subject of research, formulate a research hypothesis, develop methods, techniques and research tools and creatively apply them and draw conclusions based on research results, to the extent necessary to implement the research project in which he or she participates.	SD_U11	assignment report, oral credit
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to critically evaluate the scientific achievements and expert activity in the area of issues in which the doctoral dissertation is prepared.	SD_K01	assignment report, oral credit

Calculation of ECTS points

Semester 1

Activity form	Activity hours*
seminar	15
information collection	5
preparation for classes	10
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 2

Activity form	Activity hours*
seminar	15
preparation for classes	10
preparation of a report	5

PhD student workload	Hours 30
Workload involving teacher	Hours 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Preparation of an application to the ethics committee.	W1, W2, U1, K1	seminar
2.	Preparing an application for financing a research project or training or internship abroad.	W2, U1	seminar
3.	Preparing a presentation of the assumptions of the doctoral thesis.	W1, W2, U1, K1	seminar
4.	Preparation of a publication or literature review.	W1, U1, K1	seminar
5.	Preparation of research project reports.	W1, W2, U1, K1	seminar

Course advanced

Semester 1

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 2

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Entry requirements

No entry requirements – implemented from the first semester.

Linking with research conducted at the university

The subject is directly related to scientific research conducted by the doctoral student under the supervision of the supervisor and in close cooperation with him.

Training in health and safety education
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory obligatory	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 1022 Occupational health and safety	**Examination** credit

Period Semester 1	Examination credit Activities and hours lecture: 6	Number of ECTS points 0.0

Goals

C1	1. Familiarizing doctoral students starting their education at the Doctoral School with the regulations and principles of health and safety of education on the basis of selected legal provisions.
C2	2. Familiarization with the threats to life and health occurring during classes, ways of protection against hazards and what to do when these threats occur
C3	3. Informing PhD students starting their education at the Doctoral School about the principles of fire protection, in particular about fire prevention methods, fire detection systems, portable fire-fighting equipment and evacuation in the event of fire and other local hazards.
C4	4. Familiarization with the general principles of first aid.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The PhD student knows and understands the basic rights and obligations in the field of health and safety of education as well as the rules applicable during classes	SD_W11	credit
W2	The PhD student knows and understands the rules of safe conduct at the scene of an incident, including the basic activities of cardiopulmonary resuscitation and dealing with an unconscious person	SD_W12	credit
Skills – PhD student can:			
U1	A PhD student is able to identify potential threats to life and health during classes and outside of them and behave adequately to the threat	SD_U15	credit
U2	A PhD student is able to avoid endangering their own health and assess their own abilities when providing first aid	SD_U16	credit
Social competences – PhD student is ready to:			
K1	The PhD student is ready to comply with the legal regulations in the field of health and safety of education and the need to update them due to the changing legal status	SD_K10	credit
K2	A PhD student is ready to comply with the rules of health and safety of education during classes and outside of them, to help other people and to be responsible for their own life and health and that of others	SD_K11	credit

Calculation of ECTS points

Activity form	Activity hours*
lecture	6
independent education	2
PhD student workload	**Hours** 8

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Module I 1. Selected legal regulations in the field of health and safety of education at the university: · Rights and obligations of PhD students and the Rector in the field of health and safety · Basic safety rules for PhD students during classes organized by the university.	W1, W2, U1, U2, K1, K2	lecture
2.	2. Conditions of health and safety of education in the premises of HEIs · Roads & Passages · University premises · Lighting · Heating & Ventilation · First Aid Kit · The workstation is equipped with a screen monitor.	W1, W2, U1, U2, K1, K2	lecture
3.	3. Hazards caused by hazardous, harmful and nuisance factors. · Hazardous factors · Harmful factors · Nuisance factors	W1, W2, U1, U2, K1, K2	lecture
4.	4. Accidents that may be suffered by students during classes organized by the University. · Rules of conduct in the event of accidents and in situations of hazards and breakdowns.	W1, W2, U1, U2, K1, K2	lecture

No.	Course content	Subject's learning outcomes	Activities
5.	5. Principles of first aid · Emergency Medical Services System in Poland · First aid in legal acts. · The chain of survival. · Lifeguard safety. · Securing the scene. · Assessment of the injured person's condition (ABC) and call for help. · Safe position. · Cardiopulmonary resuscitation (CPR). · CPR using an automated external defibrillator (AED). . Dealing with life-threatening conditions.	W1, W2, U1, U2, K1, K2	lecture
6.	6. Fire protection · Fire protection in legislation · Health and safety obligations · Methods of extinguishing fires · Portable fire extinguishing equipment · Evacuation	W1, W2, U1, U2, K1, K2	lecture
7.	Module II · Threats of biological agents in the educational environment · Personal Protective Equipment (PPE) against biological hazards · Environmental issues.	W1, W2, U1, U2, K1, K2	lecture
8.	Module III · Chemical Hazards in the Educational Environment · Personal Protective Equipment (PPE) against chemical hazards · Environmental Issues	W1, W2, U1, U2, K1, K2	lecture

Course advanced

Teaching methods :

e-learning, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
lecture	credit	Watching and listening to the presentation is the basis for recognition of participation in the mandatory training

Entry requirements

attendance at the training is mandatory

Linking with research conducted at the university

Not applicable

Introduction to R-programming
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** - graded credit

Period Semester 1	**Examination** - **Activities and hours** classes: 15	**Number of ECTS points** 0.0

Period Semester 2	**Examination** graded credit **Activities and hours** classes: 15	**Number of ECTS points** 2.0

Goals

C1	The purpose of the course is to introduce the R programming language, which in the future is to be used for processing and analyzing, as well as visualization of scientific data.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	The PhD student understands for what purpose you can use the R program for analysis and visualization of collected biomedical data.	SD_W06	practical test, Project presentation and developing one practical task using R, for other students, based on knowledge of the issue presented by the student.
Skills – PhD student can:			
U1	The PhD student can develop workflow the analytical procedure using the R Program.	SD_U06, SD_U09	practical test, Project presentation and developing one practical task using R, for other students, based on knowledge of the issue presented by the student.
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to apply practical skills in the field of bioinformatics to the field he represents.	SD_K08	practical test, Project presentation and developing one practical task using R, for other students, based on knowledge of the issue presented by the student.

Calculation of ECTS points

Semester 1

Activity form	Activity hours*
classes	15
PhD student workload	**Hours** 15

* hour means 45 minutes

Semester 2

Activity form	Activity hours*
classes	15
independent education	20
PhD student workload	**Hours** 35
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Introduction to programming in R, Program and libraries installation in R. R syntax -logical expression, variables, functions, mathematical operators, data types, comments, help.	W1, U1, K1	classes
2.	R syntax - vectors, barpots from data vectors, lack of data, factors, matrices, data storage, loading and saving data i.e. CSV, TXT, XLSX, descriptive statistics, manipulation of data sets.	W1, U1, K1	classes
3.	R syntax - basics of graphic presentation (bar plots, histograms, pie charts, linear charts), many graphics on one chart, GGPLOT library with examples of use.	W1, U1, K1	classes
4.	R syntax based on the use of statistical procedures, i.e. linear (and non-linear) correlation, linear regression.	W1, U1, K1	classes
5.	R syntax based on the use of statistical procedures, i.e. t-studenttest i ANOVA.	W1, U1, K1	classes
6.	R syntax based on the use of statistical procedures, i.e. chi-square and Z-association coefficient.	W1, U1, K1	classes
7.	Project prepared by a student - Part 1	W1, U1, K1	classes
8.	Project prepared by a student - Part 2	W1, U1, K1	classes
9.	Presentation of projects with demonstration tasks part 1	W1, U1, K1	classes
10.	Presentation of projects with demonstration tasks part 2	W1, U1, K1	classes

Course advanced

Semester 1

Teaching methods :

computer classes, demonstration, e-learning, workshop, practical classes

Activities	Examination methods	Credit conditions
classes	practical test	A student after another batch of material will have the task of performing a practical task aimed at verifying his knowledge and practical skills. There will be five "check points". Three tasks for 5 points and two for 10 points (a total of 35 points). .

Semester 2

Teaching methods :

computer classes, e-learning, workshop

Activities	Examination methods	Credit conditions
classes	practical test, Project presentation and developing one practical task using R, for other students, based on knowledge of the issue presented by the student.	1. A student after another batch of material will have the task of performing a practical task aimed at verifying his knowledge and practical skills. It will be a continuation of the material from the previous semester. It will be one practical test for which 10 points can be obtained. 2. The student will have to prepare a project on a given topic and a task for the others. For preparation of the project, student will receive max. 20 points. For each correctly completed task developed by other students, student can get 5 points for each task (maximum 35 points). In total (throughout the course), a student can get 100 points. The requirement to be credited is to obtain 60 points.

Additional info

Due to the use of computers and open source software, classes may be held online.

Entry requirements

no requirements

Linking with research conducted at the university

The R program is a tool used for processing statistical and bioinformatic data to analyze and present the results of scientific research. Below examples of three publications are presented with results based on the R Program.

Applying for funding for a research project
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory obligatory	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 2	Examination graded credit Activities and hours seminar: 24 workshop: 6	Number of ECTS points 3.0

Goals

C1	Teaching doctoral students to independently search for information about sources of financing for scientific research.
C2	Teaching doctoral students how to independently develop a scientific research project.
C3	Teaching doctoral students about the basics of project management.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	Rules for obtaining funds to finance research project	SD_W03	oral answer, project

Code	Outcomes in terms of	Effects	Examination methods
W2	selected Polish and international sources for financing research projects and applicable procedures (e.g. grant applications, evaluation of applications by experts)	SD_W03	oral answer, project
Skills – PhD student can:			
U1	plan individual and team research projects	SD_U03	classroom observation, oral answer, essay, project
U2	act independently for your own scientific and professional development	SD_U08	classroom observation, oral answer, essay, project
U3	precisely define the purpose of research, formulate research hypotheses, and plan the use of appropriate methods and professional research tools	SD_U01	classroom observation, oral answer, essay, project
U4	prepare a grant proposal	SD_U03	oral answer, essay
Social competences – PhD student is ready to:			
K1	critical assessment of scientific achievements and expert activity within the scientific discipline in which the doctoral dissertation is prepared	SD_K01, SD_K02	classroom observation, oral answer, project
K2	critical assessment of one's own contribution to the development of the scientific discipline in which the doctoral dissertation is prepared	SD_K02	classroom observation, oral answer
K3	maintaining and developing the ethos of research and creative communities, including conducting research independently, taking into account existing limitations resulting from e.g. financial or infrastructural reasons, respecting the principle of public ownership of scientific research results, taking into account the principles of intellectual property protection	SD_K05, SD_K07	classroom observation, oral answer
K4	taking into account solutions proposed by other disciplines and fields of knowledge in their research	SD_K09	oral answer

Calculation of ECTS points

Activity form	Activity hours*
seminar	24
workshop	6
preparation for classes	60

	Hours
PhD student workload	90
Workload involving teacher	30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Institutions financing scientific research. Types of grants available to young researchers.	W1, W2	seminar
2.	Methods of submitting scientific projects.	W1, W2	seminar
3.	Project preparation: how to develop research ideas, research plan, achievements of the project manager, budget, importance of the project results and how to select collaborators.	W1, W2, U1, U2, U3, U4, K1, K2, K3, K4	seminar, workshop
4.	Project evaluation from the reviewer's perspective. The importance of carefully developing all parts of the project.	W1, W2, U1, K3	seminar, workshop

Course advanced

Teaching methods :

discussion, seminar, workshop, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
seminar	classroom observation, oral answer, essay, project	Students must prepare selected parts of their own research project and actively participate in classes, presentations and discussions. The final grade is the average obtained from the grade for the presentation and the grade for the written work.
workshop	classroom observation, oral answer, essay, project	Students must prepare selected parts of their own research project and actively participate in classes, presentations and discussions. The final grade is the average obtained from the grade for the presentation and the grade for the written work.

Entry requirements

Linking with research conducted at the university

1. Żelaszczyk D, Jakubczyk M, Pytka K, Rapacz A, Walczak M, Janiszewska P, Pańczyk K, Żmudzki P, Słoczyńska K, Marona H, Waszkielewicz AM. Design, synthesis and evaluation of activity and pharmacokinetic profile of new derivatives of xanthone and piperazine in the central nervous system. Bioorg Med Chem Lett. 2019 Nov 1;29(21):126679. doi: 10.1016/j.bmcl.2019.126679. Epub 2019 Sep 9.
2. Czesnikiewicz-Guzik M, Osmenda G, Siedlinski M, Nosalski R, Pelka P, Nowakowski D, Wilk G, Mikolajczyk TP, Schramm-Luc A, Furtak A, Matusik P, Koziol J, Drozdz M, Munoz-Aguilera E, Tomaszewski M, Evangelou E, Caulfield M, Grodzicki T, D'Aiuto F, Guzik TJ. Causal association between periodontitis and hypertension: evidence from Mendelian randomization and a randomized controlled trial of non-surgical periodontal therapy. Eur Heart J. 2019 Nov 1;40(42):3459-3470. doi: 10.1093/eurheartj/ehz646

Biostatistics
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Mandatory
obligatory

Disciplines
Medical science, Pharmaceutical science, Health science

ISCED classification
0917 Traditional and complementary medicine and therapy

Didactic cycle
2025/26

Realization year
2025/26

Lecture languages
polish, english

Block
obligatory for passing a year

Examination
graded credit

Period	Examination	Number of ECTS points
Semester 2	graded credit **Activities and hours** classes: 25	3.0

Goals

C1	The aim of teaching of Biostatistics is the knowledge and skills to perform the statistical analysis of existing research data.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	the rules of statistical reasoning;	SD_W01	assignment report
W2	statistical tests used to between groups comparisons, the assumptions and possibility to use these tests;	SD_W01	assignment report

Code	Outcomes in terms of	Effects	Examination methods
W3	the ruls of presentation of the results in reports, manuscripts, etc.;	SD_W01, SD_W06	assignment report
W4	the rules of the choice of proper statistical methods to solve the research problem;	SD_W01	assignment report
Skills – PhD student can:			
U1	to prepare the database, to verify the quality of database, to make the transformations of variables;	SD_U01, SD_U06	classroom observation, assignment report
U2	to prepare description of the study population usiong the correct statistical measures;	SD_U01, SD_U06	classroom observation, assignment report
U3	to chose the proper statistical methods to solve the research problem;	SD_U01, SD_U06	classroom observation, assignment report
U4	to perform statistical analysis to find out if there are any statistical differences between the study groups;	SD_U01, SD_U06	classroom observation, assignment report
U5	to make conclusions based on the statistical analysis performed;	SD_U01, SD_U06	classroom observation, assignment report
U6	to prepare the presentation of the results of the statistical analysis (description of the sample, results of the statistical reasoning) with the use of proper tables or graphs suitable for specific purposes (including the audience, the type of presentation, and the Journal requirements, etc.);	SD_U06	classroom observation, assignment report
U7	to make a critical apprisal of the results of the statistical analysis published in research manuscripts.	SD_U01	classroom observation, assignment report
Social competences – PhD student is ready to:			
K1	a critical approach to the results presented in scientific manuscripts, reports	SD_K01, SD_K02	classroom observation, assignment report
K2	use in his/her own work the achievements of other research disciplines (Biostatistics).	SD_K08, SD_K09	classroom observation, assignment report

Calculation of ECTS points

Activity form	Activity hours*
classes	25
analysis of the research material	50
preparation for classes	15
PhD student workload	**Hours** 90
Workload involving teacher	**Hours** 25

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Concepts of statistical thinking. The rules of statistical reasoning.	W1	classes
2.	The database - the project and data cleaning procedures.	U1	classes
3.	The description of the population - statistical measures and rules hoe\w to chose the proper ones. The presentation of the data - tables and graphs.	W3, U1, U2, U6	classes
4.	Checking the assumption for the distribution of variable.	W1, W2, W3, W4, U1, U3, U4, U5, U6	classes
5.	The association between two nominal variables.	W1, W2, W3, W4, U1, U3, U4, U5, U6, U7, K1, K2	classes
6.	The comparison between two groups - ordered or interval variables, independent samples.	W1, W2, W3, W4, U1, U3, U4, U5, U6, U7, K1, K2	classes
7.	The comparison between two dependent samples (repeated measures) - ordinal or interbval variables.	W1, W2, W3, W4, U1, U3, U4, U5, U6, U7, K1, K2	classes
8.	The analysis of variance - univariable model.	W1, W2, W3, W4, U1, U3, U4, U5, U6, U7, K1, K2	classes
9.	The linear regression model - the possibility to use and t\interpretation of the results.	W1, W2, W3, W4, U1, U3, U4, U5, U6, U7, K1, K2	classes

Course advanced

Teaching methods :

computer classes, discussion, problem solving method, computer room

Activities	Examination methods	Credit conditions
classes	classroom observation, assignment report	The student is obliged to prepare all required practical tasks. Each individual task should be graded at least 50%. To receive the fainal credit student should achieve the average (aritmetic mean) of minimum 60% from all tasks.

Additional info

The grade is based on the following grading system (the aritmetic mean of all required tasks).
   92,0-100,0   - very good (5.0)   84,0 - 91,9   - good plus (4.5)   76,0 – 83,9   - good (4.0)   68,0 – 75,9   - satisfactory plus (3.5)   60,0 – 67,9   - satisfactory (3.0)   <60,0   - unsatisfactory (failed) (2.0)
Zaliczenie w drugim terminie odbywa się według tych samych zasad.

Entry requirements

The knowledge of research methods and the theoty of the probability.

Linking with research conducted at the university

In the Chair of Epidemiology and Preventive Medicine different research projects are ongoing, including:

- Environmental Health Research in Poland: Preventing Risk to Children From Environmental Exposures and Air Pollution - the project with Columbia University, New York; principal investigator for the Polish part dr hab. Agnieszka Pac (2021)
- EXPANSE: EXposome Powered tools for healthy living in urbAN Settings - Horizon2020; partner from JU" dr hab. Agnieszka Pac (2020-2024)

A critical review of the literature
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory elective	**Lecture languages** polish
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 2	Examination graded credit Activities and hours seminar: 15	Number of ECTS points 1.0

Goals

C1	The aim of teaching is to acquire proficiency in assessing the credibility and significance of published scientific research results at an advanced level.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	research methods used in the discipline in which the doctoral project is being carried out	SD_W02	classroom observation, essay
Skills – PhD student can:			

Code	Outcomes in terms of	Effects	Examination methods
U1	to critically analyse and evaluate published scientific research articles, assess their credibility in proving causal relationships	SD_U01, SD_U12, SD_U14	classroom observation
U2	to suggest alternative methodological solutions that could improve the credibility of scientific evidence published in the field of medical and health sciences	SD_U12, SD_U13, SD_U14	classroom observation
U3	initiate, lead and participate responsibly in discussions regarding scientific issues	SD_U07, SD_U14	classroom observation
Social competences – PhD student is ready to:			
K1	scientific skepticism and critical assessment of scientific achievements in the field of medical and health sciences	SD_K01, SD_K02	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
seminar	15
preparation of a report	4
preparation for classes	11

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Each class is conducted in the form of a separate moderated discussion regarding one original scientific work. Each student has the task of planning and leading a team's work on assessing the credibility and significance of the research results of a scientific article of his or her choice during one class. The remaining PhD students actively participate in the discussion.	W1, U1, U2, U3, K1	seminar

Course advanced

Teaching methods :

textual analysis, discussion, group work, Tutoring

Activities	Examination methods	Credit conditions
seminar	classroom observation, essay	Assessment of the preparation and conduct of the discussion and participation in the discussion at the seminar, according to the following scale: Assessment 2: cannot prepare or carry out and summarize the discussion Grade 3: prepares, conducts and summarizes the discussion satisfactorily Grade 4: prepares, conducts and summarizes the discussion well Grade 5: prepares, conducts and summarizes discussions to an outstanding degree In case of difficulties in qualifying for the above-mentioned categories, it is permissible to use ratings of 3.5 and 4.5

Entry requirements

1. Advanced knowledge in the field of a chosen problem in the field of health sciences.
2. Knowledge of quantitative research designs and the interpretation of their results.
3. Ability to develop own knowledge

Linking with research conducted at the university

1. The level of knowledge of diabetic prevention in Poland – is there a phenomenon of pluralistic ignorance? By: Katarzyna Pawlak-Sobczak; Wojciech Drygas; Magdalena Kwaśniewska; Elżbieta Dziankowska-Zaborszczyk; Andrzej Pająk; Krystyna Kozakiewicz; Tomasz Zdrojewski; Marcin Rutkowski; Andrzej Tykarski; Wojciech Bielecki. In: International Journal of Occupational Medicine and Environmental Health, Vol 34, Iss 5, Pp 667-678 (2021); Nofer Institute of Occupational Medicine, 2021. Language: English, Baza danych: Directory of Open Access Journals
2. Social networks and cognitive function in older adults: findings from the HAPIEE study. By: Yifan Nie; Marcus Richards; Ruzena Kubinova; Anastasiya Titarenko; Sofia Malyutina; Magdalena Kozela; Andrzej Pajak; Martin Bobak; Milagros Ruiz. In: BMC Geriatrics, Vol 21, Iss 1, Pp 1-14 (2021); BMC, 2021. Language: English, Baza danych: Directory of Open Access Journals
3. Congruent relations between perceived neighbourhood social cohesion and depressive symptoms among older European adults: An East-West analysis. By Ruiz, Milagros; Malyutina, Sofia; Pajak, Andrzej; Kozela, Magdalena; Kubinova, Ruzena; Bobak, Martin. In Social Science & Medicine. September 2019 237 Language: English. DOI: 10.1016/j.socscimed.2019.112454, Baza danych: ScienceDirect.

Activities of university and non-university research centres
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 2	**Examination** graded credit **Activities and hours** lecture: 6 seminar: 24	**Number of ECTS points** 1.0

Goals

C1	The aim of the course is to present the principles of operation, scope of research, methodology, apparatus and the method of financing the most modern research centers, among others Jagiellonian Centre for Experimental Therapeutics (JCET), Małopolska Centre of Biotechnology (MCB), Center for Experimental and Innovative Medicine (OMEI), Center for Medical Genomics OMICRON, Department of Bioinformatics and Telemedicine.
C2	Preparing students for cooperation with the above-mentioned research centers as part of their research work.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	benefits from establishing interdisciplinary research centers in terms of increased possibilities of acquiring scientific projects, expanding the R&D offer and the scope of commercialization of research	SD_W08	group assessment
W2	benefits from establishing interdisciplinary research centers in terms of staff development, optimization of the use of equipment, expansion of research infrastructure and financing possibilities	SD_W03	group assessment
W3	the main development trends of scientific disciplines crucial for education in medical and health sciences	SD_W09	group assessment
Skills – PhD student can:			
U1	using the acquired knowledge, analyze and evaluate the results of scientific research in the area of projects conducted in individual research centers	SD_U12, SD_U13	test
U2	define the subject of research that can be performed in cooperation with individual research centers	SD_U11	test
U3	formulate new solutions to problems and introduce new research methods and tools into their research based on the known possibilities offered by modern research centers	SD_U13	test
Social competences – PhD student is ready to:			
K1	cooperation with researchers from other disciplines and fields of knowledge in solving cognitive and practical problems	SD_K08	group assessment
K2	apply solutions proposed by researchers from interdisciplinary research centers in their research	SD_K09	group assessment

Calculation of ECTS points

Activity form	Activity hours*
lecture	6
seminar	24

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Presentation of the history of research centers among others Jagiellonian Centre for Experimental Therapeutics (JCET), Małopolska Centre of Biotechnology (MCB), Center for Experimental and Innovative Medicine (OMEI), Center for Medical Genomics OMICRON, Department of Bioinformatics and Telemedicine.	W1, W2	lecture
2.	Overview of the principles of operation and financing of the above-mentioned. research centers	W2	lecture
3.	Presentation of the most interesting topics of conducted research, the most important achievements of conducted research (grants / patents / implementations / awards, etc.).	W2, W3	lecture
4.	The most commonly used methods of laboratory research /molecular methods/ analytical research / animal models/ computational techniques in medical research	W3, U1, U2, K1, K2	seminar
5.	Presentation of modern equipment used in individual research centers.	U2, U3, K2	seminar
6.	Presentation of the most important research trends in a individual research center.	W3, U1, K1	seminar
7.	Principles and methods of imaging diagnosis used in laboratory animals for the purposes of scientific research.	W3, U2, U3, K2	seminar

Course advanced

Teaching methods :

discussion, group work, workshop, trip, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
lecture	group assessment	Assessment of the doctoral student's activity in the classroom by the teacher.
seminar	test	positive evaluation of the test (over 50%) satisfactory 51% -65% good 65% -80% very good 80% -100%

Entry requirements

Knowledge of basic biological and chemical issues

Linking with research conducted at the university

Projects:
International projects and consortiums: SEQC2 (Sequencing Quality Control phase 2), MetaSUB (Metagenomics & Metadesign of Subway & Urban Biomes), and MAQC Society (Massive Analysis and Quality Control) Dr hab, P. Łabaj MCB
Weave-UNISONO project "Specific pathomechanisms of aging-related endothelial dysfunction in sepsis: study of mechanisms and experimental therapy" prof. Chłopicki JCET in cooperation with the team of prof. Csaba Szabo from the Swiss University of Freiburg.
mmunicom Europe Sp. z o. o. "Development and implementation of an innovative strategy for the selective, systemic elimination of interleukin 6 (IL-6) from the circulation in oncological patients, along with the definition of plasma and tissue

biomarkers with predictive and prognostic significance"Leader of the scientific task: dr hab. Zbigniew Arent, prof. UR
Articles:

1. Adamczyk A, Matuszyk E, Radwan B, Rocchetti S, Chlopicki S, Baranska M. Toward Raman Subcellular Imaging of Endothelial Dysfunction. J Med Chem. 2021 Apr 22;64(8):4396-4409. doi: 10.1021/acs.jmedchem.1c00051. Epub 2021 Apr 6. PMID: 33821652; PMCID: PMC8154563.

2. Arent Z, Gilmore C, Pardyak L, Dubniewicz K, McInerney B, Ellis W. The serological and genetic diversity of the Leptospira interrogans Icterohaemorrhagiae serogroup circulating in the UK. J Vet Res. 2023 Dec 19;67(4):529-536. doi: 10.2478/jvetres-2023-0063. PMID: 38130449; PMCID: PMC10730551.

3. Ryon KA, Tierney BT, Frolova A, Kahles A, Desnues C, Ouzounis C, Gibas C, Bezdan D, Deng Y, He D, Dias-Neto E, Elhaik E, Afshin E, Grills G, Iraola G, Suzuki H, Werner J, Udekwu K, Schriml L, Bhattacharyya M, Oliveira M, Zambrano MM, Hazrin-Chong NH, Osuolale O, Łabaj PP, Tiasse P, Rapuri S, Borras S, Pozdniakova S, Shi T, Sezerman U, Rodo X, Sezer ZH, Mason CE. A history of the MetaSUB consortium: Tracking urban microbes around the globe. iScience. 2022 Oct 20;25(11):104993. doi: 10.1016/j.isci.2022.104993. PMID: 36299999; PMCID: PMC9589169.

4.Grad P, Przeklasa-Bierowiec AM, Malinowski KP, Witowski J, Proniewska K, Tatoń G. Application of HoloLens-based augmented reality and three-dimensional printed anatomical tooth reference models in dental education. Anat Sci Educ. 2023 Jul-Aug;16(4):743-755. doi: 10.1002/ase.2241. Epub 2022 Dec 28. PMID: 36524288.

5.Ludwig-Słomczyńska AH, Seweryn MT, Kapusta P, Pitera E, Mantaj U, Cyganek K, Gutaj P, Dobrucka Ł, Wender-Ożegowska E, Małecki MT, Wołkow PP. The transcriptome-wide association search for genes and genetic variants which associate with BMI and gestational weight gain in women with type 1 diabetes. Mol Med. 2021 Jan 20;27(1):6. doi: 10.1186/s10020-020-00266-z. PMID: 33472578; PMCID: PMC7818927

Systematic reviews
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 2	Examination graded credit Activities and hours seminar: 6 workshop: 9	Number of ECTS points 2.0

Goals

C1	Practical classes onthe principles of the development of systematic reviews, each of its step and encouraging critical thinking.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	methodology of systematic review and primary studies inderpinning it, with selected detailed topics, specific to the discipline in which dissertation of prepared at the level enabling revision of existing paradygms	SD_W02	oral answer, project

Code	Outcomes in terms of	Effects	Examination methods
Skills – PhD student can:			
U1	Using knowledge regarding developmentt of systematic reviews critically analysing and evaluating the results of research in the domain of represented scientific discipline and their own contribution to the development of this discipline	SD_U01	oral answer, project, assignment report
U2	Define aim of the study 'systematic review", formulating research hypothesis, developing methods, techniques, research tols and creatively applying them, concluding on the basis of study results	SD_U01	oral answer, project, assignment report
Social competences – PhD student is ready to:			
K1	critical evaluation of its own contribution to the development of science discipline in which diisseration is prepared	SD_K02	oral answer, assignment report

Calculation of ECTS points

Activity form	Activity hours*
seminar	6
workshop	9
preparation for classes	10
preparation of a project	25
PhD student workload	**Hours** 50
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Systematic reviews - introduction and definitions, basic principles of developing protocol of a systematic review. Formulating research problem - workshops.	W1, U2	seminar, workshop
2.	Ppreparing protocol of a systematic review cont. Principles of study identification and formulating search strategy - worshops.	W1, U2	seminar, workshop
3.	Risk of bias assessment of studies in systematic review - workshops. Interpretation of metaanalysis - workshops.	W1, U1, K1	seminar, workshop

No.	Course content	Subject's learning outcomes	Activities
4.	Collecting, analysis and interpretation of the data from studies. Peparing metaanalysis - workshops..	W1, U1, K1	seminar, workshop
5.	Assessment of the quality of systematic review - workshops. Evaluation of the certaintyee body of evidnce in systematic rreview - GRADE methodology.	W1, U1, K1	seminar, workshop

Course advanced

Teaching methods :

textual analysis, brainstorm, computer classes, demonstration, discussion, project method, group work, workshop, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
seminar	oral answer, project, assignment report	Evaluation of knowledge and skills on the basis of the following criteria: 1. Active participation in the class assessed by the teacher (0-20 p.). 2. Submitting tasks assigned during classes (0-30 p.) 3. Evaluation of the quality of the project prepared in a small group (0-50 p.). 4. Final grade is calculated on the basis of the sum of the points collected from active participation, tasks assigned and project in a small group. 5. Criteria for final grade: 60.0% - 67.9% = pass (3.0); 68.0% - 75.9% = pass plus (3.5); 76.0% - 83.9% = good (4.0); 84.0% - 91.9% = good plus (4.5); 92.0% - 100% = very good (5.0).
workshop	oral answer, project, assignment report	Evaluation of knowledge and skills on the basis of the following criteria: 1. Active participation in the class assessed by the teacher (0-20 p.). 2. Submitting tasks assigned during classes (0-30 p.) 3. Evaluation of the quality of the project prepared in a small group (0-50 p.). 4. Final grade is calculated on the basis of the sum of the points collected from active participation, tasks assigned and project in a small group. 5. Criteria for final grade: 60.0% - 67.9% = pass (3.0); 68.0% - 75.9% = pass plus (3.5); 76.0% - 83.9% = good (4.0); 84.0% - 91.9% = good plus (4.5); 92.0% - 100% = very good (5.0).

Additional info

Credit can be received only if 1 and 2 below is completed:
1) All individual and group tasks are delivered (active participation or in case of justified non-attendance - task assigned by the teacher)
2) Student actively participate in preparation of the presentation from the project in a small group. Detailed assessment criteria will be provided during class.
Student is obliged to punctually attend the classes.

Entry requirements

English language
Knowledge regarding researrch methods

Linking with research conducted at the university

EVBRES
Puljak L, Bala MM, Zając J, Meštrović T, Buttiġieġ S, Yanakoulia M, Briel M, Lunny C, Lesniak W, Poklepović Peričić T, Alonso-Coello P, Clarke M, Djulbegovic B, Gartlehner G, Giannakou K, Glenny AM, Glenton C, Guyatt G, Hemkens LG, Ioannidis JPA, Jaeschke R, Juhl Jørgensen K, Martins-Pfeifer CC, Marušić A, Mbuagbaw L, Meneses Echavez JF, Moher D, Nussbaumer-Streit B, Page MJ, Pérez-Gaxiola G, Robinson KA, Salanti G, Saldanha IJ, Savović J, Thomas J, Tricco AC, Tugwell P, van Hoof J, Pieper D. Methods proposed for monitoring the implementation of evidence-based research: a cross-sectional study. J Clin Epidemiol. 2024 Jan 5:111247. doi: 10.1016/j.jclinepi.2024.111247. Epub ahead of print.

Puljak L, Bala MM, Mathes T, Poklepovic Pericic T, Wegewitz U, Faggion CM Jr, Matthias K, Storman D, Zajac J, Rombey T, Bruschettini M, Pieper D. AMSTAR 2 is only partially applicable to systematic reviews of non-intervention studies: a meta-research study. J Clin Epidemiol. 2023 Nov;163:11-20. doi: 10.1016/j.jclinepi.2023.08.021. Epub 2023 Sep 1.
Nørgaard B, Briel M, Chrysostomou S, Ristic Medic D, Buttigieg SC, Kiisk E, Puljak L, Bala M, Pericic TP, Lesniak W, Zając J, Lund H, Pieper D. A systematic review of meta-research studies finds substantial methodological heterogeneity in citation analyses to monitor evidence-based research. J Clin Epidemiol. 2022 Oct;150:126-141. doi: 10.1016/j.jclinepi.2022.06.021.
Lund H, Bała M, Blaine C, Brunnhuber K, Robinson KA. How to improve the study design of clinical trials in internal medicine : recent advances in the evidence-based methodology. Polskie Archiwum Medycyny Wewnętrznej 2021 : Vol. 131, nr 9, s. 848-853, str. 4 z 26 10.20452/pamw.16076
Bala MM, Poklepović Peričić T, Zajac J, Rohwer A, Klugarova J, Välimäki M, Lantta T, Pingani L, Klugar M, Clarke M, Young T. What are the effects of teaching Evidence-Based Health Care (EBHC) at different levels of health professions education? An updated overview of systematic reviews. PLoS One. 2021 Jul 22;16(7):e0254191. doi: 10.1371/journal.pone.0254191
Cochrane
Bała MM, Celińska-Lowenhoff M, Szot W, Padjas A, Kaczmarczyk M, Świerz MJ, Undas A. Antiplatelet and anticoagulant agents for secondary prevention of stroke and other thromboembolic events in people with antiphospholipid syndrome. Cochrane Database of Systematic Reviews 2020, nr 10; doi: CD012169
Bala MM, Strzeszynski L, Topor-Madry R. Mass media interventions for smoking cessation in adults. Cochrane Database Syst Rev. 2017 Nov 21;11:CD004704. doi: 10.1002/14651858.CD004704.pub4. Review.
Bała MM, Malecka-Massalska TJ, Koperny M, Zając J, Jarczewski JD, Szczeklik W. Anti-cytokine targeted therapies for ANCA-associated vasculitis. Cochrane Database of Systematic Reviews 2020, nr 9, CD008333
Bala MM, Paszek E, Lesniak W, Wloch-Kopec D, Jasinska K, Undas A. Antiplatelet and anticoagulant agents for primary prevention of thrombosis in individuals with antiphospholipid antibodies. Cochrane Database Syst Rev. 2018 Jul 13;7:CD012534. doi: 10.1002/14651858.CD012534.pub2.
Sliwka A, Jankowski M, Gross-Sondej I, Storman M, Nowobilski R, Bala MM. Once-daily long-acting beta$_2$-agonists/inhaled corticosteroids combined inhalers versus inhaled long-acting muscarinic antagonists for people with chronic obstructive pulmonary disease. Cochrane Database Syst Rev. 2018 Aug 24;8:CD012355. doi: 10.1002/14651858.CD012355.pub2. Review.
NutriRECS
Valli C, Maraj M, Prokop-Dorner A, Kaloteraki C, Steiner C, Rabassa M, Solà I, Zajac J, Johnston BC, Guyatt GH, Bala MM, Alonso-Coello P. People's Values and Preferences about Meat Consumption in View of the Potential Environmental Impacts of Meat: A Mixed-methods Systematic Review. Int J Environ Res Public Health. 2022 Dec 24;20(1):286. doi: 10.3390/ijerph20010286.
Vernooij R, Guyatt GH, Zeraatkar D, Han MA, Valli C, El Dib R, Alonso-Coello P, Bala MM, Johnston BC. Reconciling contrasting guideline recommendations on red and processed meat for health outcomes. J Clin Epidemiol. 2021 Oct;138:215-218. doi: 10.1016/j.jclinepi.2021.07.008
Valli C, Santero M, Prokop-Dorner A, Howatt V, Johnston BC, Zajac J, Han MA, Pereira A, Kenji Nampo F, Guyatt GH, Bala MM, Alonso-Coello P, Rabassa M. Health Related Values and Preferences Regarding Meat Intake: A Cross-Sectional Mixed-Methods Study. Int J Environ Res Public Health. 2021 Nov 4;18(21):11585. doi: 10.3390/ijerph182111585
Howatt V, Prokop-Dorner A, Valli C, Zajac J, Bala MM, Alonso-Coello P, Guyatt GH, Johnston BC. Values and Preferences Related to Cancer Risk among Red and Processed Meat Eaters: A Pilot Cross-Sectional Study with Semi-Structured Interviews. Foods. 2021 Sep 14;10(9):2182. doi: 10.3390/foods1009218
Johnston BC, Zeraatkar D, Vernooij RWM, Rabassa M, El Dib R, Valli C, Han MA, Alonso-Coello P, Bala MM, Guyatt GH.

Unprocessed red meat and processed meat consumption. Ann Intern Med. 2020;172(9):639-640. doi: 10.7326/L20-0126.

Valli C, Howatt V, Prokop-Dorner A, Rabassa M, Johnston BC, Zajac J, Han MA, Kenji Nampo F, Guyatt GH, Bala MM, Alonso-Coello P. Evaluating adults' health-related values and preferences about unprocessed red meat and processed meat consumption: protocol for a cross-sectional mixed-methods study. F1000Res. 2020 May 11;9:346. doi: 10.12688/f1000research.23593.2.

Zeraatkar D, Johnston BC, Bartoszko J, Cheung K, Bala MM, Valli C, Rabassa M, Sit D, Milio K, Sadeghirad B, Agarwal A, Zea AM, Lee Y, Han MA, Vernooij RWM, Alonso-Coello P, Guyatt GH, El Dib R. Effect of lower versus higher red meat intake on cardiometabolic and cancer outcomes: asystematic review of randomized trials. Ann Intern Med. 2019;171(10):721-731.

Johnston BC, Zeraatkar D, Han MA, Vernooij RWM, Valli C, El Dib R, Marshall C, Stover PJ, Fairweather-Taitt S, Wójcik G, Bhatia F, de Souza R, Brotons C, Meerpohl JJ, Patel CJ, Djulbegovic B, Alonso-Coello P, Bala MM, Guyatt GH. Unprocessed red meat and processed meat consumption: dietary guideline recommendations from the nutritional recommendations (NutriRECS) Consortium. Ann Intern Med. 2019;171(10):756-764;

Valli C, Rabassa M, Johnston BC, Kuijpers R, Prokop-Dorner A, Zajac J, Storman D, Storman M, Bala MM, Solà I, Zeraatkar D, Han MA, Vernooij RWM, Guyatt GH, Alonso-Coello P; NutriRECS Working Group. Health-related values and preferences regarding meat consumption: amixed-methods systematic review; Ann Intern Med. 2019;171(10):742-755.

Vernooij RWM, Zeraatkar D, Han MA, El Dib R, Zworth M, Milio K, Sit D, Lee Y, Gomaa H, Valli C, Swierz MJ, Chang Y, Hanna SE, Brauer PM, Sievenpiper J, de Souza R, Alonso-Coello P, Bala MM, Guyatt GH, Johnston BC. Patterns of red and processed meat consumption and risk for cardiometabolic and cancer outcomes: asystematic review and meta-analysis of cohort studies. Ann Intern Med. 2019;171(10):732-741.

Han MA, Zeraatkar D, Guyatt GH, Vernooij RWM, El Dib R, Zhang Y, Algarni A, Leung G, Storman D, Valli C, Rabassa M, Rehman N, Parvizian MK, Zworth M, Bartoszko JJ, Lopes LC, Sit D, Bala MM, Alonso-Coello P, Johnston BC. Reduction of red and processed meat intake and cancer mortality and incidence: asystematic review and meta-analysis of cohort studies. Ann Intern Med. 2019;171(10):711-720.

Zeraatkar D, Han MA, Guyatt GH, Vernooij RWM, El Dib R, Cheung K, Milio K, Zworth M, Bartoszko JJ, Valli C, Rabassa M, Lee Y, Zajac J, Prokop-Dorner A, Lo C, Bala MM, Alonso-Coello P, Hanna SE, Johnston BC. Red and processed meat consumption and risk for all-cause mortality and cardiometabolic outcomes: systematic review and meta-analysis of cohort studies. Ann Intern Med. 2019;171(10):703-710.

Zeraatkar D, Guyatt GH, Alonso-Coello P, Bala MM, Rabassa M, Han MA, Vernooij RWM, Valli C, El Dib R, Johnston BC.Red and processed meat consumption and risk for all-cause mortality and cardiometabolic outcomes. Ann Intern Med. 2020;172(7):511-512. doi: 10.7326/L20-0070.

GRADE

Meneses-Echavez JF, Bidonde J, Yepes-Nuñez JJ, Poklepović Peričić T, Puljak L, Bala MM, Storman D, Swierz MJ, Zając J, Montesinos-Guevara C, Zhang Y, Chavez Guapo N, Schünemann H, Flottorp S, Alonso-Coello P. Evidence to decision frameworks enabled structured and explicit development of healthcare recommendations. J Clin Epidemiol. 2022 Oct;150:51-62. doi: 10.1016/j.jclinepi.2022.06.004.

Publikacje (project NCN)

Zajac JF., Storman D, Swierz MJ, Koperny M, Weglarz P, Staskiewicz W, Gorecka M, Skuza A, Wach A, Kaluzinska K, Bochenek-Cibor J, Johnston BC, Bala MM. Are systematic reviews addressing nutrition for cancer prevention trustworthy? A systematic survey of quality and risk of bias. Nutrition Reviews 2021 : Dec 17;nuab093. doi: 10.1093/nutrit/nuab093. Online ahead of print

Swierz MJ, Storman D, Zajac J, Koperny M, Weglarz P, Staskiewicz W, Gorecka M, Skuza A, Wach A, Kaluzinska K, Bochenek-Cibor J, Johnston BC, Bala MM. Similarities, reliability and gaps in assessing the quality of conduct of systematic reviews using AMSTAR-2 and ROBIS: systematic survey of nutrition reviews. BMC Med Res Methodol. 2021 Nov 27;21(1):261. doi: 10.1186/s12874-021-01457

Storman D, Koperny M, Zając J, Polak M, Weglarz P, Bochenek-Cibor J, Swierz MJ, Staskiewicz W, Gorecka M, Skuza A, Wach AA, Kaluzinska K, Bała MM. Predictors of Higher Quality of Systematic Reviews Addressing Nutrition and Cancer Prevention. Int J Environ Res Public Health. 2022 Jan 3;19(1):506. doi: 10.3390/ijerph19010506.

NZN 2.0/3.0

Storman M, Storman D, Jasinska KW, Swierz MJ, Bala MM. The quality of systematic reviews/meta-analyses published in the field of bariatrics: a cross-sectional systematic survey using AMSTAR 2 and ROBIS. Obes Rev. 2020 May;21(5):e12994. doi: 10.1111/obr.12994

Swierz MJ, Storman D,Staskiewicz W, Gorecka M, , Jasinska KW, Swierz AM, Tobola P, Skuza A, Bala MM. The efficacy of probiotics in patients with morbid obesity undergoing bariatric surgery – systematic review and meta-analysis.Surg Obes Rel Dis 2020. doi: 10.1016/j.soard.2020.08.038

Swierz MJ, Storman D, Jasinska KW, Storman M, Staskiewicz W, Gorecka M, Skuza A, Tobola P, Bala MM. A systematic review and meta-analysis of perioperative behavioral lifestyle and nutritional interventions in bariatric surgery – a call for better research and reporting. Surg Obes Rel Dis 2020. doi: 10.1016/j.soard.2020.08.008;

Methods and ethics of research in humans
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Mandatory
elective

Disciplines
Medical science, Pharmaceutical science, Health science

ISCED classification
0917 Traditional and complementary medicine and therapy

Didactic cycle
2025/26

Realization year
2025/26

Lecture languages
polish, english

Block
obligatory for passing a year

Examination
graded credit

Period	Examination	Number of
Semester 2	graded credit	**ECTS points**
		2.0
	Activities and hours	
	seminar: 18	

Goals

C1	To familiarize PhD students with the most important elements of the methodology of research conducted in human populations.
C2	Knowledge of the principles of critical analysis - in relation to the study design and interpretation of the results.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	the rules of the study plan preparation - the essential parts of the study plan, methods of the data collection	SD_W01, SD_W02	assignment report

Code	Outcomes in terms of	Effects	Examination methods
W2	the rules of conducting the observational study - descriptive and analitical ones	SD_W01, SD_W02	assignment report
W3	the rules of conducting the interventional study, in particular randomized controlled trial	SD_W01, SD_W02	assignment report
W4	the rules for the critical apprisal of the study	SD_W01, SD_W02	assignment report
W5	error and bias - error types and classification	SD_W01, SD_W02	assignment report
W6	ethical conditions of research activities involving people in biomedicine	SD_W01, SD_W02	assignment report
Skills – PhD student can:			
U1	to formulate the research problem, define the aims that will be achieved in the research	SD_U01, SD_U11	assignment report
U2	to select the type of the study appropriate to achieve the objectives with justification for the choice	SD_U01, SD_U11	assignment report
U3	to plan the course of the observational and interventional study	SD_U01, SD_U11	assignment report
U4	to indicate potential strengths and weaknesses of the study plan, to determine how the existence of systematic errors can be excluded	SD_U01, SD_U11	assignment report
U5	to perform the critical apprisal of the study plan	SD_U01, SD_U05, SD_U11	assignment report
U6	to perform risk-benefit analysis of research involving humans in biomedicine	SD_U01, SD_U11	assignment report
Social competences – PhD student is ready to:			
K1	using the achievements of other disciplines to develop one's competences as a researcher	SD_K08	assignment report

Calculation of ECTS points

Activity form	Activity hours*
seminar	18
preparation of a project	30
preparation for classes	12
PhD student workload	**Hours** 60
Workload involving teacher	**Hours** 18

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	From idea to research plan - aims and hypotheses, the study sample.	W1, U1	seminar
2.	The choice of the study plan - the observatinal study - adventages and disadvantages of different types of observational study. The potencial errors in observational study.	W1, W2, W5, U1, U2, U3, U4, K1	seminar
3.	The interventional study - the ruls of study conducting and interpretation of the results. The potencial errors in interventional study.	W1, W3, W5, U1, U2, U3, U4, K1	seminar
4.	The critical apprisal of the study.	W4, W5, U4, U5	seminar
5.	The etical considerations about the research.	W6, U6	seminar

Course advanced

Teaching methods :

textual analysis, discussion, problem solving method, group work

Activities	Examination methods	Credit conditions
seminar	assignment report	The credit will be given to PhD students who receive minimum 50% (of the maximum number of points) of each task.

Additional info

The final grade is based on the average from two tasks - the research plan and critical apprisal.

   90,0-100,0   - very good (5.0)   80,0-89,9   - good plus (4.5)   70,0 – 89,9 - good (4.0)   60,0 – 79,9 - satisfactory plus (3,5)   50,0 – 69,9 - satisfactory (3,0)   <50,0   - unsatisfactory (2,0)

The rules for retake are exactly the same as for the first term.

Entry requirements

W Katedrze Epidemiologii i Medycyny Zapobiegawczej UJCM prowadzone są między innymi następujące badania międzynarodowe:
"Badania nad wpływem zanieczyszczenia powietrza na zdrowie oraz korzyściami płynącymi z polityki poprawy jakości powietrza atmosferycznego w Krakowie" - the project with Columbia University, New York; principal investigator for the Polish part dr hab. Agnieszka Pac (2015-2021)
EXPANSE: EXposome Powered tools for healthy living in urbAN Settings - Horizon2020; partner from JU" dr hab. Agnieszka Pac (2020-2024)

Wybrane publikacje:
1. Vernooij RWM, Zeraatkar D, Han MA, El Dib R, Zworth M, Milio K, Sit D, Lee Y, Gomaa H, Valli C, Swierz MJ, Chang Y, Hanna SE, Brauer PM, Sievenpiper J, de Souza R, Alonso-Coello P, Bala MM, Guyatt GH, Johnston BC. Patterns of Red and Processed Meat Consumption and Risk for Cardiometabolic and Cancer Outcomes: A Systematic Review and Meta-analysis of Cohort Studies. Ann Intern Med. 2019 Nov 19;171(10):732-741. doi: 10.7326/M19-1583. Epub 2019 Oct 1.
2. Pac A, Tobiasz-Adamczyk B, Błędowski P, Skalska A, Szybalska A, Zdrojewski T, Więcek A, Chudek J, Michel JP, Grodzicki T. Influence of Sociodemographic, Behavioral and Other Health-Related Factors on Healthy Ageing Based on Three Operative Definitions. J Nutr Health Aging. 2019;23(9):862-869. doi: 10.1007/s12603-019-1243-5.
3. Strzebonska K, Blukacz M, Wasylewski MT, Polak M, Gyawali B, Waligora M. Risk and benefit for umbrella trials in oncology: a systematic review and meta-analysis. BMC Med. 2022; 20:219.

Linking with research conducted at the university

W Katedrze Epidemiologii i Medycyny Zapobiegawczej UJCM prowadzone są między innymi następujące badania międzynarodowe:

"Badania nad wpływem zanieczyszczenia powietrza na zdrowie oraz korzyściami płynącymi z polityki poprawy jakości powietrza atmosferycznego w Krakowie" - the project with Columbia University, New York; principal investigator for the Polish part dr hab. Agnieszka Pac (2015-2021)

EXPANSE: EXposome Powered tools for healthy living in urbAN Settings - Horizon2020; partner from JU" dr hab. Agnieszka Pac (2020-2024)

Wybrane publikacje:

1. Vernooij RWM, Zeraatkar D, Han MA, El Dib R, Zworth M, Milio K, Sit D, Lee Y, Gomaa H, Valli C, Swierz MJ, Chang Y, Hanna SE, Brauer PM, Sievenpiper J, de Souza R, Alonso-Coello P, Bala MM, Guyatt GH, Johnston BC. Patterns of Red and Processed Meat Consumption and Risk for Cardiometabolic and Cancer Outcomes: A Systematic Review and Meta-analysis of Cohort Studies. Ann Intern Med. 2019 Nov 19;171(10):732-741. doi: 10.7326/M19-1583. Epub 2019 Oct 1.
2. Pac A, Tobiasz-Adamczyk B, Błędowski P, Skalska A, Szybalska A, Zdrojewski T, Więcek A, Chudek J, Michel JP, Grodzicki T. Influence of Sociodemographic, Behavioral and Other Health-Related Factors on Healthy Ageing Based on Three Operative Definitions. J Nutr Health Aging. 2019;23(9):862-869. doi: 10.1007/s12603-019-1243-5.
3. Strzebonska K, Blukacz M, Wasylewski MT, Polak M, Gyawali B, Waligora M. Risk and benefit for umbrella trials in oncology: a systematic review and meta-analysis. BMC Med. 2022; 20:219.

Methods and ethics of research in animals
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 2	Examination graded credit Activities and hours seminar: 18	Number of ECTS points 2.0

Goals

C1	Familiarisation with the legal and ethical conditions for conducting research on animals.
C2	The ability to use acquired knowledge to critically analyse and evaluate the results of scientific research involving laboratory animals.
C3	Ability to prepare an application for consent to conduct an experiment on animals.
C4	Acquiring social competence to initiate activities to protect laboratory animals and apply the 3Rs in research involving them.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	Legal and ethical aspects of conducting experiments on animals	SD_W03	essay
Skills – PhD student can:			
U1	present the methodological and ethical issues of animal research in a way that is understandable to nonspecialists	SD_U02	essay
U2	write an application for consent to conduct experiments on animals	SD_U09	essay
U3	to perform the critical apprisal of the study plan	SD_U05	essay
Social competences – PhD student is ready to:			
K1	fulfilling the social obligations of researchers and creators, as well as initiating activities in the public interest, including: by providing the public with appropriate information and opinions regarding the use of laboratory animals in science	SD_K04	essay

Calculation of ECTS points

Activity form	Activity hours*
seminar	18
preparation for classes	10
independent education	10
preparation of a project	20
PhD student workload	**Hours** 58
Workload involving teacher	**Hours** 18

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Ethical and legal issues of conducting research on animals.	W1, U1, K1	seminar
2.	Methods of conducting research on animals based on the 3R principle (replacements, reductions, and refinements).	W1, U1, U3	seminar
3.	Rules for writing an application for the use of animals in experiments to the ethics committee.	W1, U2	seminar
4.	Alternative methods in animal research.	U2, K1	seminar

No.	Course content	Subject's learning outcomes	Activities
5.	Methods for reducing distress in animals participating in research.	W1, U2	seminar
6.	Laboratory animal adoptions.	W1, U1, K1	seminar

Course advanced

Teaching methods :

group work, seminar

Activities	Examination methods	Credit conditions
seminar	essay	Attendance at classes, completion of the exercise application form for LKE (Local Ethics committee) DST - attendance at classes and correct completion of the exercise application form for LKE 51 - 64% +DST - attendance at classes and correct completion of the exercise application form for LKE 65 - 69% DB - attendance at classes and correct completion of the exercise application form for LKE 70 - 84% +DB - attendance at classes and correct completion of the exercise application form for LKE 85 - 89% BDB - attendance at classes and correct completion of the exercise application form for LKE 90 - 100%

Additional info

During the seminar, Students will create a trial version of an application for permission to conduct animal research to the Local Ethics Committee. Each Student is required to send their own completed application to the tutor.

Entry requirements

1. The student knows the basics of conducting scientific research.

Linking with research conducted at the university

1. Jastrzębska-Więsek M, Wesołowska A, Kołaczkowski M, Varney M A, Newman-Tancredi A, Depoortere R Y. The selective 5-HT1A receptor agonist, NLX-112, overcomes tetrabenazine-induced catalepsy and depression-like behavior in the rat. Behav Pharm, 2022: 35, 5: 333-341, doi: 10.1097/FBP.0000000000000681
2. Jastrzębska-Więsek M, Kotańska M, Grzeszczak A, Jaromir A, Walczak M, Partyka A, Gdula-Argasińska J, Smolik M, Zagórska A. The antidepressant-like activity, effects on recognition memory deficits, bioavailability, and safety after chronic administration of new dual-acting small compounds targeting neuropsychiatric symptoms in dementia. Int J Mol Sci, 2022: 23, 19, id. art. 11452, doi: 10.3390/ijms231911452
3. Bilski J, Wojcik D, Danielak A, Mazur-Bialy A, Magierowski M, Tonnesen K, Brzozowski B, Surmiak M, Magierowska K, Pajdo R, Ptak-Belowska A, Brzozowski T. Alternative therapy in prevention of experimental and clinical inflammatory bowel disease. Impact of regular physical activity, intestinal alkaline phosphatase and herbal products. Current Pharmaceutical Design 2020 : Vol. 26, nr 25, s. 2936-2950.

Methods and ethics of health care system research
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2025/26
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 2	Examination graded credit Activities and hours seminar: 18	Number of ECTS points 2.0

Goals

C1	Presentation of key ethical issues in research on the health care system.
C2	Presentation of possibilities and training in the use of various scientific methods in research on the health care system.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	ethical and legal issues related to research on the health care system	SD_W03	classroom observation

Code	Outcomes in terms of	Effects	Examination methods
W2	quantitative descriptive, ecological and cross-sectional research and understands the need for their use in research on the health care system	SD_W01	classroom observation
W3	qualitative research methods used in research on the health care system	SD_W01	classroom observation
W4	principles of monetary data analysis	SD_W03	classroom observation
Skills – PhD student can:			
U1	to perform an analysis of the demographic and epidemiological determinants of the selected area of interest in health care system	SD_U01, SD_U05, SD_U11	essay
U2	to perform an analysis of political, social, economic and technological conditions (PEST) and policy analysis using Deliberative Policy Analysis tools	SD_U01, SD_U05, SD_U11, SD_U12	essay
U3	to perform an analysis of the inflation effect in the assessment of the dynamics of health expenditure.	SD_U01, SD_U05, SD_U11	essay
U4	to criticaly analyse the research results of the health care system.	SD_U14	classroom observation
Social competences – PhD student is ready to:			
K1	for critical assessment and recognition of the need to verify research paradigms in the field	SD_K03, SD_K04	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
seminar	18
preparation of a project	12
preparation of multimedia presentation	12
preparation for classes	12

PhD student workload	**Hours** 54
Workload involving teacher	**Hours** 18

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Ethical aspects of conducting scientific research in the field of public health and health care systems. (2h)	W1, U4, K1	seminar

No.	Course content	Subject's learning outcomes	Activities
2.	Quantitative research useful in research on health care systems. The an analysis of the demographic and epidemiological determinants of a selected area of activities in the health care system. (6h)	W2, U1, K1	seminar
3.	Qualitative research used to study health care systems. PEST analytical tool - characteristic features, rules of conducting the study. Policy analysis using Deliberative Policy Analysis. Tools supporting the analysis of qualitative research. (8h)	W3, U2, K1	seminar
4.	Analysis and interpretation of economic and financial data. (2h)	W4, U3, K1	seminar

Course advanced

Teaching methods :

case study, classes / practicals, problem solving method, seminar

Activities	Examination methods	Credit conditions
seminar	classroom observation, essay	Zaliczenie na ocenę na podstawie obecności oraz oceny przygotowania i aktywności na zajęciach dokonywanej przez wszystkich prowadzących(50%) a także oceny przygotowanych projektów (50%).

Entry requirements

English at a level enabling reading scientific articles.
Knowledge of basic concepts related to quantitative and qualitative research.

Linking with research conducted at the university

Piasecki J, Dranseika V, Waligora M. Should Epidemiological Studies Be Subject to Ethics Review?, Public Health Ethics. 2018;11(2): 213–220.
Zabdyr-Jamróz, M., 'All they want is money!' The deliberative theory approach to the inclusion of nurses self-interests in the 2016 strike in the Childrens Memorial Health Institute in Warsaw, Social Theory & Health, 2021 : Vol. 19, s. 68-91,
Olszowski R, Zabdyr-Jamróz M, Baran S, Pięta P, Ahmed W. A Social Network Analysis of Tweets Related to Mandatory COVID-19 Vaccination in Poland. Vaccines (Basel). 2022;10(5):750.
Gałązka-Sobotka, M., red., Kowalska-Bobko, I., red., Frączkiewicz-Wronka, A., Więckowska, B., Skrzekowska-Baran, I., Gierczyński, J., Mela, A., Łach, K., Dłutek, A., Furman, M., Raport z badań „Analiza PEST dla wdrożenia HB-HTA w Polsce", maszynopis.
Kowalska-Bobko, I., Sowada, C., Badora-Musiał, K., Kozela, M. i wsp. Diagnoza Ochrony Zdrowia W Krakowie. Miejski Program Ochrony Zdrowia „Zdrowy Kraków 2022-2024" Stan Ochrony Zdrowia W Krakowie, Kraków 2021, maszynopis,

Individual workshops with the Promotor in medical sciences
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Doctoral programme
Medical sciences

Mandatory
obligatory

Disciplines
Medical science

ISCED classification
0912 Medicine

Didactic cycle
2025/26

Realization year
2026/27, 2027/28, 2028/29

Lecture languages
polish, english

Block
obligatory for passing a year

Examination
- credit - credit - credit

Period	Examination	Number of ECTS points
Semester 3	- **Activities and hours** seminar: 15	0.0

Period	Examination	Number of ECTS points
Semester 4	credit **Activities and hours** seminar: 15	2.0

Period	Examination	Number of ECTS points
Semester 5	- **Activities and hours** seminar: 15	0.0

Period	Examination	Number of ECTS points
Semester 6	credit **Activities and hours** seminar: 15	2.0

Period Semester 7	**Examination** - **Activities and hours** seminar: 15	**Number of ECTS points** 0.0

Period Semester 8	**Examination** credit **Activities and hours** seminar: 15	**Number of ECTS points** 2.0

Goals

C1	The aim of the course is to individually prepare a doctoral student to conduct scientific work, specifically related to the research topic being implemented, which is the basis for developing a doctoral dissertation in the discipline of medical sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	scientific research methodology covering theoretical foundations and general issues related to the represented field of medical and health sciences in which education at the doctoral school takes place, and in particular the discipline of medical sciences.	SD_W01	assignment report, oral credit
W2	scientific research methodology covering selected detailed issues specific to the discipline of medical science in which the doctoral dissertation is prepared to the extent that it allows for the revision of existing paradigms	SD_W02	assignment report, oral credit
W3	economic, legal and ethical conditions of research activity and its aspects in the discipline of medical sciences	SD_W03	assignment report, oral credit
W4	issues related to obtaining research projects: sources of their financing and applicable grant application procedures, specific to the discipline of medical sciences	SD_W05	assignment report, oral credit
Skills – PhD student can:			
U1	using the acquired knowledge, critically analyze and evaluate the results of scientific research in the field of medical sciences and their own contribution to the development of this discipline, formulate new solutions to problems within existing and modified methodological paradigms; - creatively apply and develop methods, techniques and research tools appropriate for the research being conducted, - draw conclusions based on the results of scientific research	SD_U01	assignment report, oral credit

Code	Outcomes in terms of	Effects	Examination methods
U2	document and present the results of research work, and prepare scientific publications - in accordance with the rules for creating this type of studies and respecting the principles of intellectual property protection, taking into account the specificity of the medical sciences discipline.	SD_U06	assignment report, oral credit
U3	define the purpose and subject of research, formulate a research hypothesis, develop methods, techniques and research tools and creatively apply them and draw conclusions based on the results of own research	SD_U11	assignment report, oral credit
U4	use knowledge in the field of medical and health sciences to creatively identify, formulate and innovatively solve complex problems or perform research tasks	SD_U13	assignment report, oral credit
U5	comment critically on the current state of research in the field of medical sciences in which he is carrying out his doctoral project	SD_U14	assignment report, oral credit
Social competences – PhD student is ready to:			
K1	critical assessment of scientific achievements and expert activity within the discipline of medical sciences in which the doctoral dissertation is being prepared	SD_K01	oral credit
K2	critical assessment of one's own contribution to the development of the medical science discipline in which the doctoral dissertation is prepared	SD_K02	oral credit
K3	thinking and acting in an entrepreneurial way, creating new ideas and searching - in cooperation with people representing other disciplines in the field of medical and health sciences - for innovative solutions, taking up challenges/intellectual risks in the scientific/professional and public spheres and taking responsibility for the consequences of their own decision	SD_K06	oral credit

Calculation of ECTS points

Semester 3

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 4

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Semester 5

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 6

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Semester 7

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 8

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	Hours 30
Workload involving teacher	Hours 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Preparation of reports to the ethics committee.	W1, W3, U1, U3, K1, K2	seminar
2.	Preparing an application for financing a research project or a foreign internship or a trip to a scientific conference or an open access publication.	W1, W4, U1, U3, K1, K2	seminar
3.	Preparation of presentation of research results.	W1, W2, U1, U2, U3, U4, U5, K2, K3	seminar
4.	Preparation of publication.	U2, U5, K1, K2, K3	seminar
5.	Preparation of research project reports.	W1, U1, U2, K2	seminar

Course advanced

Semester 3

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 4

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 5

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 6

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 7

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 8

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Entry requirements

No entry requirements.

Linking with research conducted at the university

The subject is directly related to scientific research conducted by the doctoral student under the supervision of the supervisor and in close cooperation with him, as part of the preparation of a doctoral dissertation in the discipline of medical sciences.

Individual workshops with the Promotor in pharmaceutical sciences
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Doctoral programme
Pharmaceutical sciences

Mandatory
obligatory

Disciplines
Pharmaceutical science

ISCED classification
0916 Pharmacy

Didactic cycle
2025/26

Realization year
2026/27, 2027/28, 2028/29

Lecture languages
polish, english

Block
obligatory for passing a year

Examination
- credit - credit - credit

Period	Examination	Number of ECTS points
Semester 3	- **Activities and hours** seminar: 15	0.0

Period	Examination	Number of ECTS points
Semester 4	credit **Activities and hours** seminar: 15	2.0

Period	Examination	Number of ECTS points
Semester 5	- **Activities and hours** seminar: 15	0.0

Period	Examination	Number of ECTS points
Semester 6	credit **Activities and hours** seminar: 15	2.0

Period Semester 7	**Examination** - **Activities and hours** seminar: 15	**Number of ECTS points** 0.0
Period Semester 8	**Examination** credit **Activities and hours** seminar: 15	**Number of ECTS points** 2.0

Goals

C1	The aim of the course is to individually prepare a doctoral student to conduct scientific work, specifically related to the research topic being implemented, which is the basis for developing a doctoral dissertation in the discipline of pharmaceutical sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	scientific research methodology covering theoretical foundations and general issues related to the represented field of medical and health sciences in which education at the doctoral school takes place, and in particular the discipline of pharmaceutical sciences.	SD_W01	assignment report, oral credit
W2	scientific research methodology covering selected detailed issues specific to the discipline of pharmaceutical science in which the doctoral dissertation is prepared to the extent that it allows for the revision of existing paradigms	SD_W02	assignment report, oral credit
W3	economic, legal and ethical conditions of research activity and its aspects in the discipline of pharmaceutical sciences	SD_W03	assignment report, oral credit
W4	issues related to obtaining research projects: sources of their financing and applicable grant application procedures, specific to the discipline of pharmaceutical sciences	SD_W05	assignment report, oral credit
Skills – PhD student can:			
U1	using the acquired knowledge, critically analyze and evaluate the results of scientific research in the field of pharmaceutical sciences and their own contribution to the development of this discipline, formulate new solutions to problems within existing and modified methodological paradigms; - creatively apply and develop methods, techniques and research tools appropriate for the research being conducted, - draw conclusions based on the results of scientific research	SD_U01	assignment report, oral credit

Code	Outcomes in terms of	Effects	Examination methods
U2	document and present the results of research work, and prepare scientific publications - in accordance with the rules for creating this type of studies and respecting the principles of intellectual property protection, taking into account the specificity of the pharmaceutical sciences discipline.	SD_U06	assignment report, oral credit
U3	define the purpose and subject of research, formulate a research hypothesis, develop methods, techniques and research tools and creatively apply them and draw conclusions based on the results of own research	SD_U11	assignment report, oral credit
U4	use knowledge in the field of medical and health sciences to creatively identify, formulate and innovatively solve complex problems or perform research tasks	SD_U13	assignment report, oral credit
U5	comment critically on the current state of research in the field of pharmaceutical sciences in which he is carrying out his doctoral project	SD_U14	assignment report, oral credit
Social competences – PhD student is ready to:			
K1	critical assessment of scientific achievements and expert activity within the discipline of pharmaceutical sciences in which the doctoral dissertation is being prepared	SD_K01	oral credit
K2	critical assessment of one's own contribution to the development of the pharmaceutical science discipline in which the doctoral dissertation is prepared	SD_K02	oral credit
K3	thinking and acting in an entrepreneurial way, creating new ideas and searching - in cooperation with people representing other disciplines in the field of medical and health sciences - for innovative solutions, taking up challenges/intellectual risks in the scientific/professional and public spheres and taking responsibility for the consequences of their own decision	SD_K06	oral credit

Calculation of ECTS points

Semester 3

Activity form	Activity hours*
seminar	15
preparation for classes	15
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 4

Activity form	Activity hours*
seminar	15
preparation for classes	15
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Semester 5

Activity form	Activity hours*
seminar	15
preparation for classes	15
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 6

Activity form	Activity hours*
seminar	15
preparation for classes	15
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Semester 7

Activity form	Activity hours*
seminar	15
preparation for classes	15
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 8

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	Hours 30
Workload involving teacher	Hours 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Preparation of reports to the ethics committee.	W1, W3, U1, U3, K1, K2	seminar
2.	Preparing an application for financing a research project or a foreign internship or a trip to a scientific conference or an open access publication.	W1, W4, U1, U3, K1, K2	seminar
3.	Preparation of presentation of research results.	W1, W2, U1, U2, U3, U4, U5, K2, K3	seminar
4.	Preparation of publication.	U2, U5, K1, K2, K3	seminar
5.	Preparation of research project reports.	W1, U1, U2, K2	seminar

Course advanced

Semester 3

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 4

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 5

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 6

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 7

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 8

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Entry requirements

No entry requirements.

Linking with research conducted at the university

The subject is directly related to scientific research conducted by the doctoral student under the supervision of the supervisor and in close cooperation with him, as part of the preparation of a doctoral dissertation in the discipline of pharmaceutical sciences.

Individual workshops with the Promotor in health sciences
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Doctoral programme
Health sciences

Mandatory
obligatory

Disciplines
Health science

ISCED classification
0915 Therapy and rehabilitation

Didactic cycle
2025/26

Realization year
2026/27, 2027/28, 2028/29

Lecture languages
polish, english

Block
obligatory for passing a year

Examination
- credit - credit - credit

Period	Examination	Number of ECTS points
Semester 3	- **Activities and hours** seminar: 15	0.0

Period	Examination	Number of ECTS points
Semester 4	credit **Activities and hours** seminar: 15	2.0

Period	Examination	Number of ECTS points
Semester 5	- **Activities and hours** seminar: 15	0.0

Period	Examination	Number of ECTS points
Semester 6	credit **Activities and hours** seminar: 15	2.0

Period Semester 7	**Examination** - **Activities and hours** seminar: 15	**Number of ECTS points** 0.0
Period Semester 8	**Examination** credit **Activities and hours** seminar: 15	**Number of ECTS points** 2.0

Goals

C1	The aim of the course is to individually prepare a doctoral student to conduct scientific work, specifically related to the research topic being implemented, which is the basis for developing a doctoral dissertation in the discipline of health sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	scientific research methodology covering theoretical foundations and general issues related to the represented field of medical and health sciences in which education at the doctoral school takes place, and in particular the discipline of health sciences.	SD_W01	assignment report, oral credit
W2	scientific research methodology covering selected detailed issues specific to the discipline of health science in which the doctoral dissertation is prepared to the extent that it allows for the revision of existing paradigms	SD_W02	assignment report, oral credit
W3	economic, legal and ethical conditions of research activity and its aspects in the discipline of health sciences	SD_W03	assignment report, oral credit
W4	issues related to obtaining research projects: sources of their financing and applicable grant application procedures, specific to the discipline of health sciences	SD_W05	assignment report, oral credit
Skills – PhD student can:			
U1	using the acquired knowledge, critically analyze and evaluate the results of scientific research in the field of health sciences and their own contribution to the development of this discipline, formulate new solutions to problems within existing and modified methodological paradigms; - creatively apply and develop methods, techniques and research tools appropriate for the research being conducted, - draw conclusions based on the results of scientific research	SD_U01	assignment report, oral credit

Code	Outcomes in terms of	Effects	Examination methods
U2	document and present the results of research work, and prepare scientific publications - in accordance with the rules for creating this type of studies and respecting the principles of intellectual property protection, taking into account the specificity of the health sciences discipline.	SD_U06	assignment report, oral credit
U3	define the purpose and subject of research, formulate a research hypothesis, develop methods, techniques and research tools and creatively apply them and draw conclusions based on the results of own research	SD_U11	assignment report, oral credit
U4	use knowledge in the field of medical and health sciences to creatively identify, formulate and innovatively solve complex problems or perform research tasks	SD_U13	assignment report, oral credit
U5	comment critically on the current state of research in the field of health sciences in which he is carrying out his doctoral project	SD_U14	assignment report, oral credit
Social competences – PhD student is ready to:			
K1	critical assessment of scientific achievements and expert activity within the discipline of health sciences in which the doctoral dissertation is being prepared	SD_K01	oral credit
K2	critical assessment of one's own contribution to the development of the health science discipline in which the doctoral dissertation is prepared	SD_K02	oral credit
K3	thinking and acting in an entrepreneurial way, creating new ideas and searching - in cooperation with people representing other disciplines in the field of medical and health sciences - for innovative solutions, taking up challenges/intellectual risks in the scientific/professional and public spheres and taking responsibility for the consequences of their own decision	SD_K06	oral credit

Calculation of ECTS points

Semester 3

Activity form	Activity hours*
seminar	15
preparation for classes	15
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 4

Activity form	Activity hours*

seminar	15
preparation for classes	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Semester 5

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 6

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Semester 7

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 8

Activity form	Activity hours*
seminar	15
preparation for classes	15

PhD student workload	Hours 30
Workload involving teacher	Hours 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Preparation of reports to the ethics committee.	W1, W3, U1, U3, K1, K2	seminar
2.	Preparing an application for financing a research project or a foreign internship or a trip to a scientific conference or an open access publication.	W1, W4, U1, U3, K1, K2	seminar
3.	Preparation of presentation of research results.	W1, W2, U1, U2, U3, U4, U5, K2, K3	seminar
4.	Preparation of publication.	U2, U5, K1, K2, K3	seminar
5.	Preparation of research project reports.	W1, U1, U2, K2	seminar

Course advanced

Semester 3

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 4

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 5

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 6

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 7

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Semester 8

Teaching methods :

textual analysis, discussion, seminar, Tutoring, Mentoring

Activities	Examination methods	Credit conditions
seminar	assignment report, oral credit	Credit on the basis of a written summary of the dates of meetings with the promoter and a report of the content of the meetings and a presentation of the content of the portfolio made at the end of the summer semester. The doctoral student presents to the course coordinator a summary of meeting dates approved by the supervisor and, for review by the course coordinator, the contents of the portfolio documenting the progress of the doctoral student's research work. Oral credit includes the doctoral student's verbal commentary on the progress of the doctoral dissertation.

Entry requirements

No entry requirements.

Linking with research conducted at the university

The subject is directly related to scientific research conducted by the doctoral student under the supervision of the supervisor and in close cooperation with him, as part of the preparation of a doctoral dissertation in the discipline of health sciences.

Presentation of own research results

Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Mandatory obligatory	**Lecture languages** english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 3	Examination graded credit Activities and hours lecture: 5 workshop: 10	Number of ECTS points 1.0

Goals

C1	The aim of the course is to familiarize students of the doctoral school with the principles of preparation and elements of international presentations in English based on their own research results.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	PhD student is familiar with the knowledge transfer and commercialization of research results.	SD_W04	oral answer

Code	Outcomes in terms of	Effects	Examination methods
W2	PhD student knows and understands the rules for scientific results dissemination, also in the open-access mode, and the basic principles for the knowledge transfer to the economic and social sphere, including the basic principles for the commercialization of scientific research activity and know-how related to these results	SD_W06	oral answer
W3	PhD student knows and understands modern concepts, methods and tools for teaching or training activity	SD_W07	oral answer
W4	PhD student knows and understands global achievements, including theoretical foundations, general issues and selected specific issues related to the discipline in which the doctoral dissertation is prepared	SD_W08	oral answer
Skills – PhD student can:			
U1	PhD student using his/her knowledge can critically analyze and evaluate the results of scientific research achievements in the discipline represented and his/her contribution to its development; can formulate new solutions to problems within established and modified methodological paradigms; can creatively apply and develop methods, techniques and research tools appropriate for the conducted research; is able to make conclusions based on scientific research results	SD_U01	oral answer
U2	PhD student can disseminate or transfer the results of scientific activities also in popular forms	SD_U02	oral answer
U3	PhD student can speak a modern foreign language to the degree that enables participation in an international scientific and professional environment, in particular in connection with the involvement in conferences, seminars, workshops, etc., at home and abroad; can establish contacts for the exchange of experience and communicate on specialist topics at the B2 level of the Common European Framework of Reference for Languages, with specialists in his/her scientific and professional discipline, as well as with people from outside these environments	SD_U04	oral answer
U4	PhD student can participate in the scientific discourse and initiate a debate	SD_U07	oral answer
U5	PhD student using his/her knowledge can critically analyze and evaluate research results, expert activities and other creative works and their contribution to the knowledge development	SD_U12	oral answer
Social competences – PhD student is ready to:			
K1	PhD student is ready for a critical assessment of his/her contribution to developing the scientific discipline in which the doctoral dissertation is prepared	SD_K02	oral answer
K2	PhD student can define the role of methodological paradigms of his/her discipline and the disciplines in solving social problems	SD_K03	oral answer

Code	Outcomes in terms of	Effects	Examination methods
K3	PhD student is ready to fulfil social obligations of researchers and creators and initiate public interest activities by properly disseminating information and opinions on scientific achievements to the public, training specialists, and other activities leading to the development of a knowledge-based society	SD_K05	oral answer

Calculation of ECTS points

Activity form	Activity hours*
lecture	5
workshop	10
preparation for classes	15

	Hours
PhD student workload	30
Workload involving teacher	15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	PhD students' own research presentations, assessed by the jury and doctoral students' colleagues. Discussion related to questions from the audience.	W1, W2, W3, W4, U1, U2, U3, U4, U5, K1, K3	workshop
2.	Self promotion, how to protect and commercialize your scientific work	W2	lecture
3.	Modern technologies in application in medicine, pharmacology and health sciences	W3, W4	lecture
4.	Patenting ideas coming from the university and not only from the practical side	U1, K3	workshop
5.	Workshop on preparation of attractive presentation titles and posters	W2, W3, U2	workshop
6.	Artificial intelligence (AI) in modern data analysis and visualization	W3, W4	lecture
7.	Principles of preparing a scientific presentation	W1, W2, W3, U2	lecture
8.	How to effectively participate in research projects and programs, on the example European research funding	U4	lecture
9.	Workshops on the characteristics of scientific events as an element of building scientific networks	W1, W2, U1, U3, K3	workshop
10.	Workshops on preparation for a press interview and promotion of science as part of a scientific event	W1, U2, K2, K3	workshop

No.	Course content	Subject's learning outcomes	Activities
11.	Integrated East-West medicine	W4	lecture

Course advanced

Teaching methods :

workshop, lecture

Activities	Examination methods	Credit conditions
lecture	oral answer	Presentation on own research in English with discussion. In the event of an excused absence from classes, it is permissible to make a presentation to the jury in the next year of PhD study. Note: the consent of the Head of Doctoral School is mandatory,
workshop	oral answer	To pass the course, each doctoral student must present a presentation on his or her own research. The presentation will be assessed by a jury consisting of academic staff of the Jagiellonian University Medical College and fellow doctoral students.

Additional info

Each doctoral student is required to present a 5 min. presentation to colleagues and the jury. After the speech, the audience will ask the speaker a question and a short discussion will follow, as is the case at scientific conferences.
In addition, the presentations will be assessed by both doctoral students and the jury according to the following criteria:
1. Language of the PhD student's speech (0-incomprehensible, 5-fluent);
2. Clarity of presentation (0-bad, 5-excellent);
3. Quality of the presentation slides (0-very bad, 5-very good);
4. Speaking time (each minute over 5 minutes subtracts 1 point from the maximum score of 5);
5. Clarity of answering audience questions (0-very bad, 5-very good).

Entry requirements

Completed first year of the Doctoral School (semester I/II).

Linking with research conducted at the university

1. Piwowar M, Kułaga T. Directional Association Measurement in Contingency Tables: Genomic Case. J Comput Biol. 2019 Mar;26(3):235-240. doi: 10.1089/cmb.2018.0202. Epub 2018 Dec 18.
2. Kwinta BM, Kliś KM, Krzyżewski RM, Wilk A, Dragan M, Grzywna E, Popiela T. Elective Management of Unruptured Intracranial Aneurysms in Elderly Patients in a High-Volume Center. World Neurosurg. 2019 Jun;126:e1343-e1351. doi: 10.1016/j.wneu.2019.03.094. Epub 2019 Mar 18.
3. Polak S, Wiśniowska B, Mendyk A, Pacławski A, Szlęk J. Quantitative Assessment of the Physiological Parameters Influencing QT Interval Response to Medication: Application of Computational Intelligence Tools. Comput Math Methods Med. 2018 Jan 4;2018:3719703. doi: 10.1155/2018/3719703. eCollection 2018.
4. Strus M, Chmielarczyk A, Kochan P, Adamski P, Chełmicki Z, Chełmicki A, Pałucha A, Heczko PB. Studies on the effects of probiotic Lactobacillus mixture given orally on vaginal and rectal colonization and on parameters of vaginal health in women with intermediate vaginal flora. Eur J Obstet Gynecol Reprod Biol. 2012 Aug;163(2):210-5. doi: 10.1016/j.ejogrb.2012.05.001. Epub 2012 Jun 19. PMID: 22721635.
5. The relationship between stereochemical and both, pharmacological and ADME-Tox, properties of the potent hydantoin 5-HT7R antagonist MF-8. Kucwaj-Brysz K, Latacz G, Podlewska S, Żesławska E, Handzlik J, Lubelska A, Satała G, Nitek W, Handzlik J. Bioorg Chem. 2021 Jan;106:104466. doi: 10.1016/j.bioorg.2020.104466. Epub 2020 Nov 10.

Scientific writing
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Mandatory
obligatory

Disciplines
Medical science, Pharmaceutical science, Health science

ISCED classification
0917 Traditional and complementary medicine and therapy

Didactic cycle
2025/26

Realization year
2026/27

Lecture languages
polish

Block
obligatory for passing a year

Examination
graded credit

Period	Examination	Number of ECTS points
Semester 3	graded credit **Activities and hours** seminar: 15	1.0

Goals

C1	Introducing PhD students to writing scientific articles.
C2	Providing knowledge in writing original and review articles
C3	Familiarizing PhD students with programs and tools useful in writing scientific articles

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	knows and understands the rules for scientific results dissemination, also in the open-access mode, and the basic principles for the knowledge transfer to the economic and social sphere, including the basic principles for the commercialization of scientific research activity and know-how related to these results	SD_W06	multiple choice test
W2	knows and understands a scientific research methodology covering theoretical foundations and general issues related to the represented discipline of medical and health sciences taught at the doctoral school	SD_W01	multiple choice test
W3	knows and understands economic, legal and ethical determinants of research activity and its aspects	SD_W03	multiple choice test
W4	has basic knowledge of acquiring research projects: sources of funding and current procedures (application for grants, evaluation of applications	SD_W05	multiple choice test
Skills – PhD student can:			
U1	can document and present research work results and prepare scientific publications, respecting applicable principles and intellectual property protection rules	SD_U06	multiple choice test
U2	using his/her knowledge can critically analyze and evaluate the results of scientific research achievements in the discipline represented and his/her contribution to its development; can formulate new solutions to problems within established and modified methodological paradigms; can creatively apply and develop methods, techniques and research tools appropriate for the conducted research; is able to make conclusions based on scientific research results	SD_U01	multiple choice test
U3	can prepare an application for funding of a research project	SD_U03	multiple choice test
U4	can speak a modern foreign language to the degree that enables participation in an international scientific and professional environment, in particular in connection with the involvement in conferences, seminars, workshops, etc., at home and abroad; can establish contacts for the exchange of experience and communicate on specialist topics at the B2 level of the Common European Framework of Reference for Languages, with specialists in his/her scientific and professional discipline, as well as with people from outside these environments	SD_U04	multiple choice test
U5	can participate in the scientific discourse and initiate a debate	SD_U07	multiple choice test
Social competences – PhD student is ready to:			
K1	can identify the need to formulate new research paradigms within the discipline in which is his/her doctoral project is implemented	SD_K01	multiple choice test
K2	is ready for a critical evaluation of his/her scientific achievements and expert activities within the discipline in which the doctoral dissertation is prepared	SD_K01	multiple choice test

Code	Outcomes in terms of	Effects	Examination methods
K3	is ready to think and act in an enterprising way, creating new ideas and seeking innovative solutions with representatives of other disciplines; is prepared for intellectual challenges in scientific/professional and public sphere and taking responsibility for his/her decisions	SD_K06	multiple choice test
K4	is ready to maintain and develop the ethos of research and creative environments, including independent researching, taking into account i.a. existing financial and infrastructural constraints; is prepared to respect the principle of public ownership of research results together with the principles of intellectual property protection	SD_K07	multiple choice test
K5	identifying the need for formulating new research paradigms within the field of knowledge to which the discipline in which the doctoral project is carried out belongs	SD_K04	multiple choice test

Calculation of ECTS points

Activity form	Activity hours*
seminar	15
preparation for colloquium	3
preparation of a paper	12

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	How to write an introduction: how to start, keep the reader in mind, bridge the knowledge gap, keep the reader motivated, set the reared expectations, draw a conclusion – goal of the study how to write an abstract and discussion: elements of style (passive vs active voice), fluidity of the sentences, scientific discourse, citations	W1, W2, W3, W4, U1, U2, U3, U4, U5, K1, K2, K3, K4, K5	seminar
2.	Response to Reviewers.	W1, W2, W3, W4, U1, U2, U3, U4, U5, K1, K2, K3, K4	seminar

Course advanced

Teaching methods :

seminar

Activities	Examination methods	Credit conditions
seminar	multiple choice test	test passed >50%

Linking with research conducted at the university

Regenerative medicine from the bench to the bedside

Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Medical sciences	**Lecture languages** english
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Medical science	**Examination** graded credit
ISCED classification 0912 Medicine	

Period Semester 3	**Examination** graded credit **Activities and hours** seminar: 18 workshop: 12	**Number of ECTS points** 2.0

Goals

C1	In terms of knowledge, the student: describes the biology and physiological features of different types of stem cells, depicts their standard and experimental applications, explain the benefits and risks related to cell therapies implementation
C2	In terms of skills, the student can: figure out the basic laboratory methods on cell hadling
C3	In terms of social competences, the student is ready to: refer to common expectations and perspectives on experimental therapies in life-threatening diseases, can analyze ethical issues connected to cellular therapies as rescue options in the severest clinical conditions

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	PhD student knows and understands a scientific research methodology covering theoretical foundations and general issues related to the represented discipline of medical and health sciences taught at the doctoral school	SD_W01	classroom observation, test
W2	PhD student knows and understands the main development trends of scientific disciplines crucial for education in medical and health sciences	SD_W09	classroom observation, test
Skills – PhD student can:			
U1	PhD student can use knowledge from a given scientific discipline to creatively identify, formulate and innovatively solve complex problems or perform research tasks	SD_U13	classroom observation, test
Social competences – PhD student is ready to:			
K1	PhD student can recognize the importance of knowledge from other disciplines and domains (other than that the one in which the doctoral programme is implemented) in addressing cognitive and practical problems	SD_K08	classroom observation, test

Calculation of ECTS points

Activity form	Activity hours*
seminar	18
workshop	12
analysis of the research material	20
PhD student workload	**Hours** 50
Workload involving teacher	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Patophysiology of tissue damage and natural regenerative processes	W1, W2, K1	seminar
2.	Stem cell biology	W1, W2, U1	seminar
3.	Practical approach to stem cell handling- laboratory work: sources of stem cells, isolation, preparation and culture (practice in small groups)	W1, U1	workshop

No.	Course content	Subject's learning outcomes	Activities
4.	Pluripotent stem cells: Current possibilities of cell technology. Induced pluripotent cells (practice in small groups)	W1, U1	workshop
5.	Cancer stem cells. The neoplasm as a pathological organism. Animal models of diseases (lecture, demonstration)	W1, U1	seminar, workshop
6.	Hematopoietic stem cells – stem cells in standard therapeutic options (lecture, demonstration)	W1, U1	seminar, workshop
7.	Gene therapy- theory and the practical approach (demonstration and practice in small groups)	W1, U1	seminar, workshop
8.	Experimental gene therapies – regenerative applications in muscle, bone, , skin, heart and brain diseases (lectures, demonstration, practice)	W1, U1, K1	seminar, workshop
9.	Stem cell applications in esthetic medicine (lecture)	W1, U1, K1	seminar

Course advanced

Teaching methods :

brainstorm, classes / practicals, laboratories (labs), demonstration, presentation, seminar, lecture

Activities	Examination methods	Credit conditions
seminar	classroom observation, test	Students are accepted for the test exam based on their attendance to the lectures and an active participation practise classes.
workshop	classroom observation, test	Multiple choice test – performed during the last class meeting. The test is focused on the knowledge presented during the lectures and practice classes. The minimum correct answers for tha pass mark is 51%.

Additional info

The course is dedicated to the post-graduate students (biology or biotechnology faculties graduates, medical doctors and other master degree graduates interested in the subject).

Entry requirements

Attendance is mandatory.
One day of excused absence is allowed.

Linking with research conducted at the university

Subject is related to the following projects:
1. Determination of the mechanisms and possibility of central nervous system regeneration using mesenchymal stem cells and immunomodulation - NCN 2018/31/B/NZ3/01879

2. Significance of transcription factors associated with epithelial-mesenchymal transition and myogenesis in the development of rhabdomyosarcoma - NCN 2018/29/B/NZ5/00915

3. Ocena zastosowania indukowanych komórek pluripotencjalnych w leczeniu choroby Parkinsona przy wykorzystaniu nowego mysiego modelu tej choroby indukowanego syntetyczną neuromelaniną - NCN 2019/03/X/NZ4/00115

4. Dissecting pathomechanisms of idiopathic form of Parkinson's Disease using induced pluripotent stem cells technology - NCN 2015/17/B/NZ5/00294

5. Cardiovascular ischemia injury regeneration using Wharton Jelly as unlimited therapeuic stem cells source - NCBiR STRATEGMED2/265761/10/NCBR/2015

6. Zastosowanie komórek macierzystych mezenchymy w terapii ciężkich postaci choroby przeszczep przeciw biorcy po transplantacji allogenicznych komórek krwiotwórczych. NCN- N407 086939

Selected drug discovery technologies
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Pharmaceutical sciences	**Lecture languages** polish, english
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Pharmaceutical science	**Examination** graded credit
ISCED classification 0916 Pharmacy	

Period Semester 3	**Examination** graded credit **Activities and hours** seminar: 10 classes: 5	**Number of ECTS points** 1.0

Goals

C1	Enrichment of knowledge in the field of new drug designing methods and the latest methods of synthesizing biologically active compounds. The series of classes will also present methods of molecular modeling, sustainable chemistry (green chemistry), organocatalysis, flow-chemistry techniques and aspects related to scaling up the process of synthesis of biologically active compounds at the advanced stages of preclinical development.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	research methodology on molecular modeling, optimization of compound structure using in silico methods, synthesis of biologically active compounds using green chemistry, flow chemistry and scaling up of synthesis processes	SD_W02	classroom observation
W2	main trends in drug discovery methods, including in silico methods used for optimization of compound's biological activity and safety as well as environmentally friendly methods of synthesizing biologically active compounds	SD_W09	classroom observation
Skills – PhD student can:			
U1	using acquired knowledge, critically analyze and evaluate research results published in leading journals in medicinal chemistry, can formulate proposals for application of molecular modeling and the use of sustainable synthesis methods in discovery and development of drug candidates; can creatively apply knowledge and propose new synthesis pathways and scaling-up processes	SD_U01	classroom observation
U2	elaborate and implement practical training on achievements in the field of design and synthesis of biologically activity compounds	SD_U09	classroom observation
U3	using the acquired knowledge, can critically analyze and evaluate research results in the field of design and synthesis of biologically active compounds and assess the contribution to the development of medicinal chemistry	SD_U12	classroom observation
Social competences – PhD student is ready to:			
K1	assessment of the role of medicinal chemistry paradigms in the field of pharmaceutical science in solving social problems	SD_K03	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
seminar	10
classes	5
preparation for classes	10
preparation for classes	5

	Hours
PhD student workload	30
Workload involving teacher	15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Computer modeling methods for drug research	W1, W2, U1, U2, U3, K1	classes, seminar
2.	Classic drug dsing methods - bioisosteric replacement, homology	W1, W2, U1, U2, U3, K1	classes, seminar
3.	Modern synthesis methods - solid-phase synthesis, mechanochemistry, flow chemistry	W1, W2, U1, U2, U3, K1	classes, seminar

Course advanced

Teaching methods :

seminar, workshop

Activities	Examination methods	Credit conditions
seminar	classroom observation	condition to pass the course is 100% attendance at classes/workshops and observation of PhD's work
classes	classroom observation	condition to pass the course is 100% attendance at classes/workshops and observation of PhD's work

Entry requirements

knowledge of organic chemistry, NMR spectroscopy, mass spectrometry

Linking with research conducted at the university

Bucki A. et al. Novel 3-(1,2,3,6-Tetrahydropyridin-4-yl)-1H-indole-Based Multifunctional Ligands with Antipsychotic-Like, Mood-Modulating, and Procognitive Activity. J. Med. Chem 2017, 60, 7483. doi: 10.1021/acs.jmedchem.7b00839
Canale V. et al. Sustainable Synthesis of a Potent and Selective 5-HT 7 Receptor Antagonist Using a Mechanochemical Approach. J Org Chem 2020, 85, 10958. doi: 10.1021/acs.joc.0c01044.
Grychowska K et al. Dual 5-HT 6 and D 3 Receptor Antagonists in a Group of 1 H-Pyrrolo[3,2- c]quinolines with Neuroprotective and Procognitive Activity. ACS Chem Neurosci 2019, 10, 3183. doi: 10.1021/acschemneuro.8b00618.
Kamiński K. Novel Hybrid Anticonvulsants Derived from Pyrrolidine-2,5-dione Scaffold with Broad Spectrum of Activity in the Preclinical Studies. Curr Top Med Chem 2017, 17, 858. doi: 10.2174/1568026616666160927153025.
Zajdel P et al. Structure-Based Design and Optimization of FPPQ, a Dual-Acting 5-HT 3 and 5-HT 6 Receptor Antagonist with Antipsychotic and Procognitive Properties. J Med Chem 2021, 64 13279. doi: 10.1021/acs.jmedchem.1c00224.

Nature therapy
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Pharmaceutical sciences	**Lecture languages** polish
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Pharmaceutical science	**Examination** graded credit
ISCED classification 0916 Pharmacy	

Period Semester 3	Examination graded credit **Activities and hours** seminar: 11 classes: 4	Number of ECTS points 1.0

Goals

C1	Familiarizing doctoral students with natural raw materials and their use in modern medicine.
C2	Providing knowledge on the use of natural raw materials in the treatment of selected diseases.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	main development trends in scientific disciplines important for education in the field of medical and health sciences	SD_W01, SD_W09	test

Code	Outcomes in terms of	Effects	Examination methods
W2	terms related to raw materials of natural origin	SD_W02	test
W3	examples of contemporary natural raw materials derived from traditional medical systems	SD_W02, SD_W08	test
W4	differences related to the use of natural raw materials and isolated compounds	SD_W01, SD_W02	test
W5	examples of natural medicinal raw materials whose use has been verified positively or negatively by clinical trials	SD_W02, SD_W08	test
W6	differences between a medicinal product of natural origin and a dietary supplement	SD_W06, SD_W07	test
Skills – PhD student can:			
U1	using the acquired knowledge, critically analyze and evaluate the results of scientific research on the analysis of natural raw materials and apply and develop methods, techniques and research tools appropriate for the research being conducted	SD_U01, SD_U02	test
U2	name the pharmacological effects of medicinal raw materials of natural origin	SD_U12, SD_U13	test
U3	use scientific literature to expand knowledge about natural medicinal raw materials used in naturopathy	SD_U01, SD_U13	test
U4	present the use of natural medicinal raw materials in the therapy of selected diseases	SD_U14, SD_U15	test
Social competences – PhD student is ready to:			
K1	recognizing the importance of knowledge from other disciplines and fields of knowledge (other than the one in which the doctoral project is being carried out) in solving cognitive and practical problems	SD_K01, SD_K08, SD_K09	test
K2	showing an attitude of interest in naturopathy and its importance in modern medicine	SD_K03, SD_K05	test
K3	demonstrating skills and habits of self-education in the aspect of naturopathy	SD_K08, SD_K09	test
K4	showing interest in raw materials of natural origin and the possibilities of using them for therapeutic purposes	SD_K10	test

Calculation of ECTS points

Activity form	Activity hours*
seminar	11
classes	4
preparation for test	10
PhD student workload	**Hours** 25

Workload involving teacher	Hours 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Introduction to naturotherapy as non-invasive treatment using natural methods. Basics of phytotherapy.	W1, W2, W3, W4, W5, W6, U1, U2, U3, U4, K1, K2, K3, K4	seminar
2.	The role of natural raw materials in dietary supplements.	W1, W2, W3, U2, K1, K2, K3, K4	seminar
3.	Algae as a medicinal and cosmetological raw material used in naturopathy.	W1, W2, W3, W4, W5, W6, U1, U2, U4, K1, K2, K3, K4	seminar
4.	Mycotherapy – the use of the properties of medicinal mushrooms.	W1, W2, W3, W4, W5, W6, U1, U2, K1, K2, K3, K4	seminar
5.	Lichen as a medicinal raw material.	W1, W2, W3, W4, W5, W6, U1, U2, U4, K1	seminar
6.	Balneology as a tool used in naturotherapy.	W1, W2, W3, W4, W5, W6, U1, U2, K1, K2, K3, K4	seminar
7.	Medicinal raw materials of animal origin.	W1, W2, W3, W4, W5, W6, U1, U2, K1, K2, K3, K4	seminar
8.	The use of biotechnological methods to obtain natural raw materials.	W1, U1, K1, K2, K3, K4	classes

Course advanced

Teaching methods :

classes / practicals, educational film, seminar

Activities	Examination methods	Credit conditions
seminar	test	mandatory attendance at classes and passing the test
classes	test	mandatory attendance at classes and passing the test

Additional info

Percentage thresholds for individual grades obtained from the test verifying and assessing the effects of learning outcomes: 100% (10) correct answers grade – very good 90%80% (8–9) correct answers – good 70% 60% (7–6) correct answers – satisfactory below 50% (5 and below) correct answers grade insufficient – no credit

Entry requirements

Basic information on botany, zoology, algology at secondary school level

Linking with research conducted at the university

Subject related to scientific research

Król K., Pudełek M., Krzysiek-Mączka G., Wierdak M., Muszyńska B.,Sułkowska-Ziaja K., Krakowska A., Ryszawy D., Czyż J. (2021). Bioactive compounds from Lactarius deterrimus interfere with the invasive potential of gastric cancer cells: Lactarius deterrimus and gastric cancer. Acta biochimica Polonica, DOI: 10.18388/abp.2020_5915

Fijałkowska A., Krakowska A., Lazur J., Włodarczyk A., Zięba P., Suchanek M., Sułkowska-Ziaja K., Muszyńska B. (2021). Fortified mycelium of Fomitopsis officinalis (agaricomycetes) as a source of biologically active substances effective in the prevention of civilization diseases. International Journal of Medicinal Mushrooms, DOI:10.1615/IntJMedMushrooms.2021039778

Zagrodzki P., Paśko P., Galanty A., Tyszka-Czochara M., Wietecha-Posłuszny R., Salvans Rubiód P., Bartoń H., Prochownika E., Muszyńska B., Sułkowska-Ziaja K, Bierła K., Łobiński R., Szpunar J., Gorinstein S. (2020). Does selenium fortification of kale and kohlrabi sprouts change significantly their biochemical and cytotoxic properties? Journal of Trace Elements in Medicine and Biology, 59, 126466; https://doi.org/10.1016/j.jtemb.2020.126466

Wróbel-Biedrawa Dagmara, Grabowska Karolina, Galanty Agnieszka, Sobolewska Danuta, Żmudzki Paweł, Podolak Irma. (2020). Anti-melanoma potential of two benzoquinone homologues embelin and rapanone - a comparative in vitro study. Toxicology in Vitro DOI: 10.1016/j.tiv.2020.104826

Methods of epidemiological studies
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Health sciences	**Lecture languages** polish
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Health science	**Examination** graded credit
ISCED classification 0915 Therapy and rehabilitation	

Period Semester 3	**Examination** graded credit **Activities and hours** seminar: 15	**Number of ECTS points** 1.0

Goals

C1	The aim of the course is to familiarize students with the concepts and methods of epidemiological studiesto enable them to design, conduct, analyze and interpret epidemiological studies.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	concepts describing the health status of the population and methods of its measurement	SD_W01, SD_W02	test
W2	principles of defining the population, methods and consequences of sample selection in population studies	SD_W01, SD_W02	test

Code	Outcomes in terms of	Effects	Examination methods
W3	types of epidemiological studies and their reliability in assessing causality	SD_W01, SD_W02	test
Skills – PhD student can:			
U1	develop a strategy for assessment relationships in epidemiological studies; calculate and interpret measures of the associations between risk factors (exposures) and health outcomes	SD_U05, SD_U11	classroom observation
Social competences – PhD student is ready to:			
K1	critically assess scientific evidence from quantitative research in medical and health sciences	SD_K03	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
seminar	15
independent education	5
preparation for examination	10

	Hours
PhD student workload	30
Workload involving teacher	15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Definition of disease in epidemiological studies. Interview in quantitative research. Diagnostic tests.	W1	seminar
2.	Defining population in epidemiological studies. Selection, size and representativeness of the study samples. Response rate.	W2, K1	seminar
3.	Assessment of relationships in quantitative population studies.	W3, U1, K1	seminar
4.	Quantitative observational studies (types, data analysis startegies, measures of relationships, strengths and limitations in the interpretation of results)	W3, U1, K1	seminar
5.	Quantitative experimental studies(types, data analysis strategies, measures of relationships, strengths and limitations in the interpretation of results). Summary of quantitative research results.	W3, U1, K1	seminar

No.	Course content	Subject's learning outcomes	Activities
6.	Causality assessment - Hill's criteria. Reliability of research results.	W3, K1	seminar

Course advanced

Teaching methods :

seminar

Activities	Examination methods	Credit conditions
seminar	classroom observation, test	To pass the course, attendance and active participation in seminars and passing the final test are required. A test that may consist of single-choice questions or short answer tasks. One point is given for a correct answer to each question. In the case of passing the test on the second date or in special cases, an oral form of assessment is allowed. In such a case, a to pass, PhD Student haas to give the correct answers to three questions regarding basic concepts. The grade is based on all answers provided to all questions asked, the number of which is not limited To pass the test, it is necessary to obtain at least 61% of the possible points; grade 3: 61-65%; grade 3,5: 66-70%; grade 4: 71-75%; grade: 4,5 76-80%; grade5: very good: 81-100%.

Linking with research conducted at the university

Professional training in medical Didactics

Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27, 2027/28
Mandatory obligatory	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0114 Teacher training with subject specialisation	**Examination** - credit - credit

Period	Examination	Number of ECTS points
Period Semester 3	**Examination** - **Activities and hours** professional practice: 15	**Number of ECTS points** 0.0
Period Semester 4	**Examination** credit **Activities and hours** professional practice: 15	**Number of ECTS points** 1.0
Period Semester 5	**Examination** - **Activities and hours** professional practice: 15	**Number of ECTS points** 0.0
Period Semester 6	**Examination** credit **Activities and hours** professional practice: 15	**Number of ECTS points** 1.0

Goals

C1	preparation for professional practice in the field of medical education at the academic level.
C2	Acquiring skills to inspire and organize the development of doctoral students
C3	Acquiring competences in engaging in the education of specialists.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	modern concepts, methods and tools for conducting teaching or training activities	SD_W07	credit
Skills – PhD student can:			
U1	independently plan and act for scientific and professional development, as well as inspire and organize the development of other people	SD_U08	credit
U2	develop and carry out classes in the area of scientific activity using modern methods and tools	SD_U09	credit
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to fulfill the social obligations of researchers and creators, as well as to initiate activities for the public interest, including: by providing society in an appropriate manner with information and opinions regarding scientific achievements, engaging in the education of specialists and other activities leading to the development of a knowledge-based civil society	SD_K05	credit

Calculation of ECTS points

Semester 3

Activity form	Activity hours*
professional practice	15

PhD student workload	Hours 15

* hour means 45 minutes

Semester 4

Activity form	Activity hours*
professional practice	15

PhD student workload	Hours 15
Workload involving teacher	Hours 15

* hour means 45 minutes

Semester 5

Activity form	Activity hours*
professional practice	15

PhD student workload	Hours 15

* hour means 45 minutes

Semester 6

Activity form	Activity hours*
professional practice	15

PhD student workload	Hours 15
Workload involving teacher	Hours 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Conducting and co-conducting teaching classes with medical students	W1, U1, U2, K1	professional practice

Course advanced

Semester 3

Teaching methods :

case study, textual analysis, brainstorm, classes / practicals, clinical classes, computer classes, laboratories (labs), preclinical classes, classes in clinical skills room, classes in simulated conditions, demonstration, discussion, e-learning, educational film, educational game, staging, language conversation classes, foreign language course, metaplan, problem solving method, project method, case study method, situation method, presentation, group work, computer room, professional practice, assignments solving, seminar, simulation, low fidelity simulation, simulation in interprofessional groups, high fidelity simulation, simulated patient, participation in research, workshop, virtual patient, trip, lecture, lecture with multimedia presentation, PBL Problem Based Learning, practical classes, practical classes in simulated conditions, Tutoring, Mentoring, ćwiczenia w ambulatorium przyklinicznym,, Zajęcia demonstracyjno-ćwiczeniowe dotyczące rzadkich

zespołów chorobowych.

Activities	Examination methods	Credit conditions
professional practice	credit	observation of the doctoral student's work, report on the tasks performed.

Semester 4

Teaching methods :

case study, textual analysis, brainstorm, classes / practicals, clinical classes, computer classes, laboratories (labs), preclinical classes, classes in clinical skills room, classes in simulated conditions, demonstration, discussion, e-learning, educational film, educational game, staging, language conversation classes, foreign language course, metaplan, problem solving method, project method, case study method, situation method, presentation, group work, computer room, professional practice, assignments solving, seminar, simulation, low fidelity simulation, simulation in interprofessional groups, high fidelity simulation, simulated patient, participation in research, workshop, virtual patient, trip, lecture, lecture with multimedia presentation, PBL Problem Based Learning, practical classes, practical classes in simulated conditions, Tutoring, Mentoring, ćwiczenia w ambulatorium przyklinicznym,, Zajęcia demonstracyjno-ćwiczeniowe dotyczące rzadkich zespołów chorobowych.

Activities	Examination methods	Credit conditions
professional practice	credit	observation of the doctoral student's work, report on the tasks performed.

Semester 5

Teaching methods :

case study, textual analysis, brainstorm, classes / practicals, clinical classes, computer classes, laboratories (labs), preclinical classes, classes in clinical skills room, classes in simulated conditions, demonstration, discussion, e-learning, educational film, educational game, staging, language conversation classes, foreign language course, metaplan, problem solving method, project method, case study method, situation method, presentation, group work, computer room, professional practice, assignments solving, seminar, simulation, low fidelity simulation, simulation in interprofessional groups, high fidelity simulation, simulated patient, participation in research, workshop, virtual patient, trip, lecture, lecture with multimedia presentation, PBL Problem Based Learning, practical classes, practical classes in simulated conditions, Tutoring, Mentoring, ćwiczenia w ambulatorium przyklinicznym,, Zajęcia demonstracyjno-ćwiczeniowe dotyczące rzadkich zespołów chorobowych.

Activities	Examination methods	Credit conditions
professional practice	credit	observation of the doctoral student's work, report on the tasks performed.

Semester 6

Teaching methods :

case study, textual analysis, brainstorm, classes / practicals, clinical classes, computer classes, laboratories (labs), preclinical classes, classes in clinical skills room, classes in simulated conditions, demonstration, discussion, e-learning, educational film, educational game, staging, language conversation classes, foreign language course, metaplan, problem solving method, project method, case study method, situation method, presentation, group work, computer room, professional practice, assignments solving, seminar, simulation, low fidelity simulation, simulation in interprofessional groups, high fidelity simulation, simulated patient, participation in research, workshop, virtual patient, trip, lecture, lecture with multimedia presentation, PBL Problem Based Learning, practical classes, practical classes in simulated conditions, Tutoring, Mentoring, ćwiczenia w ambulatorium przyklinicznym,, Zajęcia demonstracyjno-ćwiczeniowe dotyczące rzadkich

zespołów chorobowych.

Activities	Examination methods	Credit conditions
professional practice	credit	observation of the doctoral student's work, report on the tasks performed.

Linking with research conducted at the university

1. Gaska, K., Pavlinec, C., Cebula, G., Pisarska-Adamczyk, M., & Szopa, M. (2023). Non-technical Skills in Cardiopulmonary Resuscitation: Improvement and Evaluation of a New Course Introduced to the Curriculum at a Medical School in Poland in 2018 to 2019. SAGE Open, 13(4). https://doi.org/10.1177/21582440231205693
2. Elvén M, Welin E, Wiegleb Edström D, Petreski T, Szopa M, Durning SJ, Edelbring S. Clinical Reasoning Curricula in Health Professions Education: A Scoping Review. J Med Educ Curric Dev. 2023 Oct 25;10:23821205231209093. doi: 10.1177/23821205231209093. PMID: 37900617; PMCID: PMC10605682.
3. Borowczyk M, Stalmach-Przygoda A, Doroszewska A, Libura M, Chojnacka-Kuraś M, Małecki Ł, Kowalski Z, Jankowska AK. Developing an effective and comprehensive communication curriculum for undergraduate medical education in Poland - the review and recommendations. BMC Med Educ. 2023 Sep 7;23(1):645. doi: 10.1186/s12909-023-04533-5. PMID: 37679670; PMCID: PMC10486093.
4. Gorski S, Prokop-Dorner A, Pers M, Stalmach-Przygoda A, Malecki Ł, Cebula G, Bombeke K. The Use of Simulated Patients Is more Effective than Student Role Playing in Fostering Patient-Centred Attitudes during Communication Skills Training: A Mixed Method Study. Biomed Res Int. 2022 Dec 17;2022:1498692. doi: 10.1155/2022/1498692. PMID: 36573197; PMCID: PMC9789908.
5. Parodis I, Andersson L, Durning SJ, Hege I, Knez J, Kononowicz AA, Lidskog M, Petreski T, Szopa M, Edelbring S. Clinical Reasoning Needs to Be Explicitly Addressed in Health Professions Curricula: Recommendations from a European Consortium. Int J Environ Res Public Health. 2021 Oct 25;18(21):11202. doi: 10.3390/ijerph182111202. PMID: 34769721; PMCID: PMC8583438.
6. Stalmach-Przygoda A, Nowakowski M, Kocurek A, Perera I, Skrzypek A, Mirecka J, Świerszcz J, Kowalska B, Górski S, Pers M, Cebula G, Szopa M. Perceptions of clinical teachers acting as examiners regarding the value of Objective Structured Clinical Examinations. Folia Med Cracov. 2020 Sep 28;60(2):109-121. doi: 10.24425/fmc.2020.135017. PMID: 33252599.
7. Pers M, Górski S, Stalmach-Przygoda A, Balcerzak Ł, Szopa M, Karabinowska A, Świerszcz J, Perera I, Cebula G. Clinical communication course and other factors affecting patient-centered attitudes among medical students. Folia Med Cracov. 2019;59(2):81-92. PMID: 31659352.
8. Świerszcz J, Stalmach-Przygoda A, Kuźma M, Jabłoński K, Cegielny T, Skrzypek A, Wieczorek-Surdacka E, Kruszelnicka O, Chmura K, Chyrchel B, Surdacki A, Nowakowski M. How does preclinical laboratory training impact physical examination skills during the first clinical year? A retrospective analysis of routinely collected objective structured clinical examination scores among the first two matriculating classes of a reformed curriculum in one Polish medical school. BMJ Open. 2017 Sep 1;7(8):e017748. doi: 10.1136/bmjopen-2017-017748. PMID: 28864488; PMCID: PMC5588968.

Current achievements in medical and health sciences
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Mandatory obligatory	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** - graded credit

Period Semester 3	Examination - **Activities and hours** e-learning lecture: 3 e-learning seminar: 7	Number of ECTS points 0.0

Period Semester 4	Examination graded credit **Activities and hours** e-learning lecture: 3 e-learning seminar: 7	Number of ECTS points 2.0

Goals

C1	The acquisition by PhD students of extended knowledge and the ability to understand and distinguish crosssectional research areas that make up the field of medical, pharmaceutical and health sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	PhD student knows and understands global achievements, including theoretical foundations, general issues and selected specific issues related to the discipline in which the doctoral dissertation is prepared	SD_W08	test
W2	PhD student knows and understands selected paradigms in the field of science in which the doctoral programme is carried out	SD_W10	test
W3	PhD student knows and understands the main development trends of scientific disciplines crucial for education in medical and health sciences	SD_W09	test
Skills – PhD student can:			
U1	PhD student using his/her knowledge can critically analyze and evaluate the results of scientific research achievements in the discipline represented and his/her contribution to its development; can formulate new solutions to problems within established and modified methodological paradigms; can creatively apply and develop methods, techniques and research tools appropriate for the conducted research; is able to make conclusions based on scientific research results	SD_U01	test
Social competences – PhD student is ready to:			
K1	PhD student can recognize the importance of knowledge from other disciplines and domains (other than that the one in which the doctoral programme is implemented) in addressing cognitive and practical problems	SD_K08	test

Calculation of ECTS points

Semester 3

Activity form	Activity hours*
e-learning lecture	3
e-learning seminar	7
preparation for examination	10
preparation of multimedia presentation	10
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 4

Activity form	Activity hours*
e-learning lecture	3
e-learning seminar	7
preparation for examination	10
preparation of multimedia presentation	10

PhD student workload	Hours 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Introduction to the subject and the schedule. Assignment or dates of the presentation, entitled "Worldwide achievements of recent years in research areas related to mine PhD-thesis"	W1, W2, W3, U1, K1	e-learning seminar
2.	Significant achievements of medicine in recent years - lecture excellent scientists representing the Faculty of Medicine	W1, W2, W3, U1, K1	e-learning lecture
3.	Significant achievements of pharmacy in recent years - lecture excellent scientists representing the Faculty of Pharmacy	W1, W2, W3, U1, K1	e-learning lecture
4.	Significant achievements of health sciences in recent years - lecture of excellent scientists representing the Faculty of Health Sciences	W1, W2, W3, U1, K1	e-learning lecture
5.	Seminar classes .Presentations of PhD students, entitled "Worldwide achievements of recent years in research areas related to mine PhD thesis", including multimedial presentation of PhD-students, discussion and completing the evaluation questionnaire by the teacher and students.	W1, W2, W3, U1, K1	e-learning seminar

Course advanced

Semester 3

Teaching methods :

discussion, e-learning, presentation, group work, seminar, lecture

Activities	Examination methods	Credit conditions
e-learning lecture	test	presence >50%, test passed (>50%)
e-learning seminar	test	presence >50%, test passed (>50%)

Semester 4

Teaching methods :

discussion, e-learning, seminar, simulation, lecture

Activities	Examination methods	Credit conditions
e-learning lecture	test	presence >50%, test passed (>50%)
e-learning seminar	test	presence >50%, test passed (>50%)

Entry requirements

Lack

Linking with research conducted at the university

Yes
List of publications of Teachers (2016-2021)
Prof. dr hab. Jadwiga Handzlik:
IDT: 0000110844.
Autorzy: Godyń Justyna, Zaręba Paula, Stary Dorota, Kaleta Maria, Kuder Kamil J., Latacz Gniewomir, Mogilski Szczepan, Reiner-Link David, Frank Annika, Doroz-Płonka Agata, Olejarz-Maciej Agnieszka, Sudoł-Tałaj Sylwia, Nolte Tobias, Handzlik Jadwiga, Stark Holger, Więckowska Anna, Malawska Barbara, Kieć-Kononowicz Katarzyna, Łażewska Dorota, Bajda Marek.
Tytuł oryginału: Benzophenone derivatives with histamine H3 receptor affinity and cholinesterase inhibitory potency as multitarget-directed ligands for possible therapy of Alzheimers disease
Czasopismo: Molecules
Szczegóły: 2023 : Vol. 28, nr 1, id. art. 238, il., bibliogr., abstr.
Uwagi: Autor korespondencyjny: Marek Bajda
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e-ISSN: 1420-3049
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Charakt. merytoryczna: praca oryginalna
Impact Factor: 4.600
Punktacja MeiN: 140.000
DOI: 10.3390/molecules28010238   Pobierz rekord
BibTeX
Excel/Calc   2
IDT: 0000113983.
Autorzy: Witek Karolina, Kaczor Aneta, Żesławska Ewa, Podlewska Sabina, Marć Małgorzata Anna, Czarnota-Łydka Kinga, Nitek Wojciech, Latacz Gniewomir, Tejchman Waldemar, Bischoff Markus, Claus Jacob, Handzlik Jadwiga.
Tytuł oryginału: Chalcogen-varied imidazolone derivatives as antibiotic resistance breakers in Staphylococcus aureus Strains
Czasopismo: Antibiotics
Szczegóły: 2023 : Vol. 12, nr 11, id. art. 1618, il., bibliogr. 57 poz., abstr.
Uwagi: Autor korespondencyjny: Jadwiga Handzlik
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p-ISSN: 2079-6382
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 4.800
Punktacja MeiN: 70.000
DOI: 10.3390/antibiotics12111618   Pobierz rekord
BibTeX
Excel/Calc   3
IDT: 0000112163.
Autorzy: Stępnicki Piotr, Targowska-Duda Katarzyna M., Martinez Anton L., Zięba Agata, Wronikowska-Denysiuk Olga, Wróbel Martyna Z., Bartyzel Agata, Trzpil Alicja, Wróbel Tomasz M., Chodkowski Andrzej, Mirecka Karolina, Karcz Tadeusz, Szczepańska Katarzyna, Loza Maria I., Budzyńska Barbara, Turło Jadwiga, Handzlik Jadwiga, Fornal Emilia, Poleszak Ewa,

Castro Marian, Kaczor Agnieszka A..

Tytuł oryginału: Discovery of novel arylpiperazine-based DA/5-HT modulators as potential antipsychotic agents - design, synthesis, structural studies and pharmacological profiling

Czasopismo: European Journal of Medicinal Chemistry

Szczegóły: 2023 : Vol. 252, id. art. 115285, il., bibliogr. 68 poz., abstr.

Uwagi: Autor korespondencyjny: Piotr Stępnicki, Agnieszka A. Kaczor

Charakt. formalna: artykuł zagraniczny

Charakt. merytoryczna: praca oryginalna

Impact Factor: 6.700

Punktacja MeiN: 200.000

BibTeX

Excel/Calc   4

IDT: 0000113433.

Autorzy: Sudoł-Tałaj Sylwia, Kucwaj-Brysz Katarzyna, Podlewska Sabina, Kurczab Rafał, Satała Grzegorz, Mordyl Barbara, Głuch-Lutwin Monika, Wilczyńska-Zawal Natalia, Jastrzębska-Więsek Magdalena, Czarnota-Łydka Kinga, Kurowska Kinga, Kubacka Monika, Żesławska Ewa, Nitek Wojciech, Olejarz-Maciej Agnieszka, Doroz-Płonka Agata, Partyka Anna, Latacz Gniewomir, Wesołowska Anna, Handzlik Jadwiga.

Tytuł oryginału: Hydrophobicity modulation via the substituents at positions 2 and 4 of 1,3,5-triazine to enhance therapeutic ability against Alzheimer's disease for potent serotonin 5-HT6R agents

Czasopismo: European Journal of Medicinal Chemistry

Szczegóły: 2023 : Vol. 260, id. art. 115756, il., bibliogr. 63 poz., abstr.

Uwagi: Autor korespondencyjny: Jadwiga Handzlik

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Charakt. formalna: artykuł zagraniczny

Charakt. merytoryczna: praca oryginalna

Impact Factor: 6.700

Punktacja MeiN: 200.000

BibTeX

Excel/Calc   5

IDT: 0000111336.

Autorzy: Łażewska Dorota, Więcek Małgorzata, Satała Grzegorz, Chałupnik Paulina, Żesławska Ewa, Honkisz-Orzechowska Ewelina, Tarasek Monika, Latacz Gniewomir, Nitek Wojciech, Szymańska Ewa, Handzlik Jadwiga.

Tytuł oryginału: New triazine derivatives as serotonin 5-HT6 receptor ligands

Czasopismo: Molecules

Szczegóły: 2023 : Vol. 28, nr 3, id. art. 1108, il., bibliogr., abstr.

Uwagi: Autor korespondencyjny: Dorota Łażewska, Jadwiga Handzlik

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Charakt. merytoryczna: praca oryginalna

Impact Factor: 4.600

Punktacja MeiN: 140.000

BibTeX

Excel/Calc   6

IDT: 0000111306.

Autorzy: Zagrodzki Paweł, Wiesner Agnieszka, Marcinkowska Monika, Jamrozik Marek, Domínguez-Alvarez Enrique, Bierła Katarzyna, Łobiński Ryszard, Szpunar Joanna, Handzlik Jadwiga, Galanty Agnieszka, Gorinstein Shela, Paśko Paweł.

Tytuł oryginału: Relationships between molecular characteristics of novel organic selenium compounds and the formation of sulfur compounds in selenium biofortified kale sprouts

Czasopismo: Molecules

Szczegóły: 2023 : Vol. 28, nr 5, id. art. 2062, il., bibliogr., abstr.

Uwagi: Autor korespondencyjny: Paweł Paśko

IDT: 0000113307.
Autorzy: Czarnota-Łydka Kinga, Sudoł-Tałaj Sylwia, Kucwaj-Brysz Katarzyna, Kurczab Rafał, Satała Grzegorz, de Candia Modesto, Samarelli Francesco, Altomare Cosimo Damiano, Carocci Alessia, Barbarossa Alexia, Żesławska Ewa, Głuch-Lutwin Monika, Mordyl Barbara, Kubacka Monika, Wilczyńska-Zawal Natalia, Jastrzębska-Więsek Magdalena, Partyka Anna, Khan Nadia, Więcek Małgorzata, Nitek Wojciech, Honkisz-Orzechowska Ewelina, Latacz Gniewomir, Wesołowska Anna, Carrieri Antonio, Handzlik Jadwiga.
Tytuł oryginału: Synthesis, computational and experimental pharmacological studies for (thio)ether-triazine 5-HT6R ligands with noticeable action on AChE/BChE and chalcogen-dependent intrinsic activity in search for new class of drugs against Alzheimer's disease
Czasopismo: European Journal of Medicinal Chemistry
Szczegóły: 2023 : Vol. 259, id. art. 115695, il., bibliogr. 111 poz., abstr.
IDT: 0000113838.
Autorzy: Kaczor Aneta, Knutelska Joanna, Kucwaj-Brysz Katarzyna, Zygmunt Małgorzata, Żesławska Ewa, Siwek Agata, Bednarski Marek, Podlewska Sabina, Jastrzębska-Więsek Magdalena, Nitek Wojciech, Sapa Jacek, Handzlik Jadwiga.
Tytuł oryginału: The subtype selectivity in search of potent hypotensive agents among 5,5-dimethylhydantoin derived α1-adrenoceptors antagonists
Czasopismo: International Journal of Molecular Sciences
Szczegóły: 2023 : Vol. 24, nr 23, id. art. 16609, il., bibliogr. 68 poz., abstr.
IDT: 0000111368.
Autorzy: Sarfraz Muhammad, Nasim Muhammad Jawad, Gruhlke Martin C.H., Handzlik Jadwiga, Jacob Claus.
Tytuł oryginału: To cut the mustard : antimicrobial activity of selenocyanates on the plate and in the gas phase
Czasopismo: Antibiotics
Szczegóły: 2023 : Vol. 12, nr 2, id. art. 290, il., bibliogr. 46 poz., abstr.

DOI: 10.3390/antibiotics12020290   Pobierz rekord
BibTeX
Excel/Calc   10
IDT: 0000108448.
Autorzy: Buzun Kamila, Gornowicz Agnieszka, Lesyk Roman, Kryshchyshyn-Dylevych Anna, Gzella Andrzej, Czarnomysy Robert, Latacz Gniewomir, Olejarz-Maciej Agnieszka, Handzlik Jadwiga, Bielawski Krzysztof, Bielawska Anna.
Tytuł oryginału: 2-{5-[(Z,2Z)-2-Chloro-3-(4-nitrophenyl)-2-propenylidene]-4-oxo-2-thioxothiazolidin-3-yl -3-methylbutanoic acid as a potential anti-breast cancer molecule.
Czasopismo: International Journal of Molecular Sciences
Szczegóły: 2022 : Vol. 23, nr 8, id. art. 4091, il., bibliogr. 53 poz., abstr.
Uwagi: Autor korespondencyjny: Agnieszka Gornowicz.
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e-ISSN: 1422-0067
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Impact Factor: 5.600
Punktacja MeiN: 140.000
DOI: 10.3390/ijms23084091   Pobierz rekord
BibTeX
Excel/Calc   11
IDT: 0000107716.
Autorzy: Kucwaj-Brysz Katarzyna, Ali Wesam, Kurczab Rafał, Sudoł-Tałaj Sylwia, Wilczyńska-Zawal Natalia, Jastrzębska-Więsek Magdalena, Satała Grzegorz, Mordyl Barbara, Żesławska Ewa, Olejarz-Maciej Agnieszka, Czarnota Kinga, Latacz Gniewomir, Partyka Anna, Wesołowska Anna, Nitek Wojciech, Handzlik Jadwiga.
Tytuł oryginału: An exit beyond the pharmacophore model for 5-HT6R agents - a new strategy to gain dual 5-HT6/5-HT2A action for triazine derivatives with procognitive potential.
Czasopismo: Bioorganic Chemistry
Szczegóły: 2022 : Vol. 121, id. art. 105695, il., bibliogr. 51 poz., abstr.
Uwagi: Autor korespondencyjny: Jadwiga Handzlik.
p-ISSN: 0045-2068
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 5.100
Punktacja MeiN: 100.000
DOI: 10.1016/j.bioorg.2022.105695   Pobierz rekord
BibTeX
Excel/Calc   12
IDT: 0000110805.
Autorzy: Bartuzi Damian, Kedzierska Ewa, Targowska-Duda Katarzyna M., Koszła Oliwia, Wróbel Tomasz M., Jademyr Simon, Karcz Tadeusz, Szczepańska Katarzyna, Stępniak Piotr, Wronikowska-Denysiuk Olga, Biała Grażyna, Handzlik Jadwiga, Kristensen Jesper L., Poso Antti, Kaczor Agnieszka A..
Tytuł oryginału: Funnel metadynamics and behavioral studies reveal complex effect of D2AAK1 ligand on anxiety-like processes
Czasopismo: Scientific Reports
Szczegóły: 2022 : Vol. 12, nr 1, id. art. 21192, il., bibliogr. 52 poz.
Uwagi: Autor korespondencyjny: Agnieszka A. Kaczor
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e-ISSN: 2045-2322
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 4.600
Punktacja MeiN: 140.000
DOI: 10.1038/s41598-022-25478-7   Pobierz rekord
BibTeX
Excel/Calc   13
IDT: 0000109289.
Autorzy: Czarnota-Łydka Kinga, Kucwaj-Brysz Katarzyna, Pyka Patryk, Haberek Wawrzyniec, Podlewska Sabina, Handzlik Jadwiga.
Tytuł oryginału: Multitargeting the action of 5-HT6 serotonin receptor ligands by additional modulation of kinases in the

search for a new therapy for Alzheimer's Disease : can it work from a molecular point of vew?
Czasopismo: International Journal of Molecular Sciences
Szczegóły: 2022 : Vol. 23, nr 15, id. art. 8768, il., bibliogr., abstr.
Uwagi: Autor korespondencyjny: Sabina Podlewska, Jadwiga Handzlik
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e-ISSN: 1422-0067
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca poglądowa
Impact Factor: 5.600
Punktacja MeiN: 140.000
DOI: 10.3390/ijms23158768   Pobierz rekord
BibTeX
Excel/Calc   14
IDT: 0000107527.
Autorzy: Marć Małgorzata Anna, Dominguez-Alvarez Enrique, Latacz Gniewomir, Doroz-Płonka Agata, Sanmartin Carmen, Spengler Gabriella, Handzlik Jadwiga.
Tytuł oryginału: Pharmaceutical and safety profile evaluation of novel selenocompounds with noteworthy anticancer activity.
Czasopismo: Pharmaceutics
Szczegóły: 2022 : Vol. 14, nr 2, id. art. 367, il., bibliogr. 82 poz., abstr.
Uwagi: Autor korespondencyjny: Małgorzata Anna Marć, Enrique Dominguez-Alvarez, Jadwiga Handzlik.
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e-ISSN: 1999-4923
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Charakt. merytoryczna: praca oryginalna
Impact Factor: 5.400
Punktacja MeiN: 100.000
DOI: 10.3390/pharmaceutics14020367   Pobierz rekord
BibTeX
Excel/Calc   15
IDT: 0000110273.
Autorzy: Ali Wesam, Garbo Sabrina, Kincses Annamária, Nové Márta, Spengler Gabriella, Di Bello Elisabetta, Honkisz-Orzechowska Ewelina, Karcz Tadeusz, Szymańska Ewa, Żesławska Ewa, Starek Małgorzata, Dąbrowska Monika, Nitek Wojciech, Kucwaj-Brysz Katarzyna, Pyka Patryk, Fioravanti Rossella, Jacob Claus, Battistelli Cecilia, Zwergel Clemens, Handzlik Jadwiga.
Tytuł oryginału: Seleno-vs. thioether triazine derivatives in search for new anticancer agents overcoming multidrug resistance in lymphoma
Czasopismo: European Journal of Medicinal Chemistry
Szczegóły: 2022 : Vol. 243, id. art. 114761, il., bibliogr. 46 poz., abstr.
Uwagi: Autor korespondencyjny: Cecilia Battistelli, Clemens Zwergel, Jadwiga Handzlik
p-ISSN: 0223-5234
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Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 6.700
Punktacja MeiN: 140.000
DOI: 10.1016/j.ejmech.2022.114761   Pobierz rekord
BibTeX
Excel/Calc   16
IDT: 0000108869.
Autorzy: Michalik Ilona, Kuder Kamil J., Kiec-Kononowicz Katarzyna, Handzlik Jadwiga.
Tytuł oryginału: Structure prediction, evaluation, and validation of GPR18 lipid receptor using free programs
Czasopismo: International Journal of Molecular Sciences
Szczegóły: 2022 : Vol. 23, nr 14, id. art. 7917, il., bibliogr., abstr.
Uwagi: Autor korespondencyjny: Kamil J. Kuder
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e-ISSN: 1422-0067
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Charakt. merytoryczna: praca poglądowa
Impact Factor: 5.600

Autorzy: Zagrodzki Paweł, Paśko Paweł, Dominguez-Alvarez Enrique, Salardon-Jimenez Noemi, Sevilla-Hernandez Clotilde, Sanmartin Carmen, Bierła Katarzyna, Łobiński Ryszard, Szpunar Joanna, Handzlik Jadwiga, Jacob Claus, Bieniek Urszula, Galanty Agnieszka, Gorinstein Shela.
Tytuł oryginału: Synthesis of novel organic selenium compounds and speciation of their metabolites in biofortified kale sprouts
Czasopismo: Microchemical Journal
Szczegóły: 2022 : Vol. 172, Part A, id. art. 106962, il., bibliogr. 23 poz., abstr.
Uwagi: Autor korespondencyjny: Paweł Zagrodzki
Autorzy: Paśko Paweł, Galanty Agnieszka, Zagrodzki Paweł, Żmudzki Paweł, Bieniek Urszula, Prochownik Ewelina, Domínguez-Alvarez Enrique, Bierła Katarzyna, Łobiński Ryszard, Szpunar Joanna, Handzlik Jadwiga, Marcinkowska Monika, Gorinstein Shela.
Tytuł oryginału: Varied effect of fortification of kale sprouts with novel organic selenium compounds on the synthesis of sulphur and phenolic compounds in relation to cytotoxic, antioxidant and anti-inflammatory activity
Czasopismo: Microchemical Journal
Szczegóły: 2022 : Vol. 179, id. art. 107509, il., bibliogr. 55 poz., abstr.
Uwagi: Autor korespondencyjny: Paweł Paśko
Uwagi: Open Access Creative Commons Attribution License CC-BY-NC-ND 4.0
Autorzy: Żesławska Ewa, Kucwaj-Brysz Katarzyna, Kincses Annamária, Spengler Gabriella, Szymańska Ewa, Czopek Anna, Marć Małgorzata Anna, Kaczor Aneta, Nitek Wojciech, Domínguez-Álvarez Enrique, Latacz Gniewomir, Kieć-Kononowicz Katarzyna, Handzlik Jadwiga.
Tytuł oryginału: An insight into the structure of 5-spiro aromatic derivatives of imidazolidine-2,4-dione, a new group of very potent inhibitors of tumor multidrug resistance in T-lymphoma cells.
Czasopismo: Bioorganic Chemistry
Szczegóły: 2021 : Vol. 109, id. art. 104735, il., bibliogr. 49 poz., abstr.
Uwagi: Autor korespondencyjny: Jadwiga Handzlik.

Autorzy: Kucwaj-Brysz Katarzyna, Baltrukevich Hanna, Czarnota Kinga, Handzlik Jadwiga.
Tytuł oryginału: Chemical update on the potential for serotonin 5-HT6 and 5-HT7 receptor agents in the treatment of Alzheimers disease.
Czasopismo: Bioorganic & Medicinal Chemistry Letters
Szczegóły: 2021 : Vol. 49, id. art. 128275, il., bibliogr. 99 poz., abstr.
Uwagi: Autor korespondencyjny: Jadwiga Handzlik.
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Charakt. merytoryczna: praca poglądowa
Impact Factor: 2.940
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DOI: 10.1016/j.bmcl.2021.128275   Pobierz rekord
BibTeX
Excel/Calc   21
IDT: 0000104331.
Autorzy: Kaczor Aneta, Szemerédi Nikoletta, Kucwaj-Brysz Katarzyna, Dąbrowska Monika, Starek Małgorzata, Latacz Gniewomir, Spengler Gabriella, Handzlik Jadwiga.
Tytuł oryginału: Computer-Aided Search for 5-Arylideneimidazolone Anticancer Agents Able To Overcome ABCB1-Based Multidrug Resistance.
Czasopismo: ChemMedChem
Szczegóły: 2021 : Vol. 16, nr 15, s. 2386-2401, il., bibliogr. 40 poz., abstr.
Uwagi: Autor korespondencyjny: Jadwiga Handzlik.
p-ISSN: 1860-7179
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Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 3.540
Punktacja MeiN: 100.000
DOI: 10.1002/cmdc.202100252   Pobierz rekord
BibTeX
Excel/Calc   22
IDT: 0000105387.
Autorzy: Żesławska Ewa, Szymańska Ewa, Nitek Wojciech, Handzlik Jadwiga.
Tytuł oryginału: Crystallographic studies of piperazine derivatives of 3-methyl-5-spirofluorenehydantoin in search of structural features of P-gp inhibitors.
Czasopismo: Acta Crystallographica. Section C, Structural Chemistry
Szczegóły: 2021 : Vol. 77, s. 467-478, il., bibliogr.
Uwagi: Autor korespondencyjny: Ewa Żesławska
e-ISSN: 2053-2296
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 1.184
Punktacja MeiN: 140.000
DOI: 10.1107/S2053229621006756   Pobierz rekord
BibTeX
Excel/Calc   23
IDT: 0000105071.
Autorzy: Godyń Justyna, Zaręba Paula, Łażewska Dorota, Stary Dorota, Reiner-Link David, Frank Annika, Latacz Gniewomir, Mogilski Szczepan, Kaleta Maria, Doroz-Płonka Agata, Lubelska Annamaria, Honkisz-Orzechowska Ewelina, Olejarz-Maciej Agnieszka, Handzlik Jadwiga, Stark Holger, Kieć-Kononowicz Katarzyna, Malawska Barbara, Bajda Marek.
Tytuł oryginału: Cyanobiphenyls : Novel H3 receptor ligands with cholinesterase and MAO B inhibitory activity as multitarget compounds for potential treatment of Alzheimer's disease.
Czasopismo: Bioorganic Chemistry
Szczegóły: 2021 : Vol. 114, id. art. 105129, il., bibliogr. 61 poz., abstr.
Uwagi: Autor korespondencyjny: Marek Bajda.
Uwagi: Open Access Creative Commons Attribution License CC-BY 4.0.
Uwagi: These authors contributed equally: Justyna Godyń, Paula Zaręba.

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Charakt. merytoryczna: praca oryginalna
Impact Factor: 5.307
Punktacja MeiN: 100.000
DOI: 10.1016/j.bioorg.2021.105129   Pobierz rekord
BibTeX
Excel/Calc   24
IDT: 0000106431.
Autorzy: Mika Kamil, Szafarz Małgorzata, Bednarski Marek, Latacz Gniewomir, Sudoł Sylwia, Handzlik Jadwiga, Pociecha Krzysztof, Knutelska Joanna, Nicosia Noemi, Szczepańska Katarzyna, Kuder Kamil J., Kieć-Kononowicz Katarzyna, Kotańska Magdalena.
Tytuł oryginału: Histamine H3 receptor ligands - KSK-59 and KSK-73 - reduce body weight gain in a rat model of excessive eating.
Czasopismo: Pharmaceuticals
Szczegóły: 2021 : Vol. 14, nr 11, id. art. 1080, il., bibliogr. 48 poz., abstr.
Uwagi: Autor korespondencyjny: Magdalena Kotańska.
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Punktacja MeiN: 100.000
DOI: 10.3390/ph14111080   Pobierz rekord
BibTeX
Excel/Calc   25
IDT: 0000105403.
Autorzy: Hogendorf Agata, Hogendorf Adam S., Kurczab Rafał, Sałata Grzegorz, Szewczyk Bernadeta, Cieślik Paulina, Latacz Gniewomir, Handzlik Jadwiga, Lenda Tomasz, Kaczorowska Katarzyna, Staroń Jakub, Bugno Ryszard, Duszyńska Beata, Bojarski Andrzej J..
Tytuł oryginału: N-skatyltryptamines - dual 5-HT6R/D2R ligands with antipsychotic and procognitive potential.
Czasopismo: Molecules
Szczegóły: 2021 : Vol. 26, nr 15, id. art. 4605, il., bibliogr. 47 poz., abstr.
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DOI: 10.3390/molecules26154605   Pobierz rekord
BibTeX
Excel/Calc   26
IDT: 0000103228.
Autorzy: Podlewska Sabina, Bugno Ryszard, Lacivita Enza, Leopoldo Marcello, Bojarski Andrzej J., Handzlik Jadwiga.
Tytuł oryginału: Low Basicity as a Characteristic for Atypical Ligands of Serotonin Receptor 5-HT2.
Czasopismo: International Journal of Molecular Sciences
Szczegóły: 2021 : Vol. 22, nr 3, id. art. 1035, il., bibliogr. 83 poz., abstr.
Uwagi: Autor korespondencyjny: Sabina Podlewska, Jadwiga Handzlik.
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DOI: 10.3390/ijms22031035   Pobierz rekord
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Excel/Calc   27
IDT: 0000103062.

Autorzy: Kaczor Aneta, Witek Karolina, Podlewska Sabina, Veronique Sinou Veronique, Czekajewska Joanna, Żesławska Ewa, Doroz-Płonka Agata, Lubelska Annamaria, Latacz Gniewomir, Nitek Wojciech, Bischoff Markus, Alibert Sandrine, Pages Jean-Marie, Jacob Claus, Karczewska Elżbieta, Bolla Jean-Michel, Handzlik Jadwiga.
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Autorzy: Głowacka Iwona E., Grabkowska-Drużyc Magdalena, Andrei Graciela, Schols Dominique, Snoeck Robert, Witek Karolina, Podlewska Sabina, Handzlik Jadwiga, Piotrowska Dorota G..
Tytuł oryginału: Novel N-substituted 3-aryl-4-(diethoxyphosphoryl)azetidin-2-ones as antibiotic enhancers and antiviral agents in search for a successful treatment of complex infections.
Czasopismo: International Journal of Molecular Sciences
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Punktacja MeiN: 140.000
DOI: 10.3390/ijms22158032   Pobierz rekord
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Excel/Calc   29
IDT: 0000102242.
Autorzy: Ali Wesam, Benedetti Rosaria, Handzlik Jadwiga, Zwergel Clemens, Battistelli Cecilia.
Tytuł oryginału: The innovative potential of selenium-containing agents for fighting cancer and viral infections
Czasopismo: Drug Discovery Today
Szczegóły: 2021 : Vol. 26, nr 1, s. 256-263, il., bibliogr. 64 poz., abstr.
Uwagi: Autor korespondencyjny: Clemens Zwergel, Cecilia Battistelli.
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IDT: 0000106334.
Autorzy: Sudoł Sylwia, Cios Agnieszka, Jastrzębska-Więsek Magdalena, Honkisz-Orzechowska Ewelina, Mordyl Barbara, Wilczyńska-Zawal Natalia, Sałata Grzegorz, Kucwaj-Brysz Katarzyna, Partyka Anna, Latacz Gniewomir, Olejarz-Maciej Agnieszka, Wesołowska Anna, Handzlik Jadwiga.
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Charakt. formalna: artykuł zagraniczny
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Autorzy: Kucwaj-Brysz Katarzyna, Latacz Gniewomir, Podlewska Sabina, Żesławska Ewa, Handzlik Jarosław, Lubelska Annamaria, Satala Grzegorz, Nitek Wojciech, Handzlik Jadwiga.
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Czasopismo: Bioorganic Chemistry
Szczegóły: 2021 : Vol. 106, id. art. 104466, il., bibliogr., abstr.
Uwagi: Autor korespondencyjny: Jadwiga Handzlik.
Charakt. formalna: artykuł zagraniczny
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IDT: 0000106730.
Autorzy: Kucwaj-Brysz Katarzyna, Dela Anna, Podlewska Sabina, Bednarski Marek, Siwek Agata, Sałata Grzegorz, Czarnota Kinga, Handzlik Jadwiga, Kieć-Kononowicz Katarzyna.
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Czasopismo: Molecules
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Uwagi: Autor korespondencyjny: Katarzyna Kucwaj-Brysz, Katarzyna Kieć-Kononowicz.
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IDT: 0000099969.
Autorzy: Nizi Maria Giulia, Desantis Jenny, Nakatani Yoshio, Massari Serena, Mazzarella Maria Angela, Shetye Gauri, Sabatini Stefano, Barreca Maria Letizia, Manfroni Giuseppe, Felicetti Tommaso, Rushton-Green Rowena, Hards Kiel, Latacz Gniewomir, Satała Grzegorz, Bojarski Andrzej J., Cecchetti Violetta, Kolar Michal H., Handzlik Jadwiga, Cook Gregory M., Franzblau Scott G., Tabarrini Oriana.
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Uwagi: Autor korespondencyjny: Oriana Tabarrini.
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IDT: 0000100533.

Autorzy: Sudoł Sylwia, Kucwaj-Brysz Katarzyna, Kurczab Rafał, Wilczyńska Natalia, Jastrzębska-Więsek Magdalena, Satała Grzegorz, Latacz Gniewomir, Głuch-Lutwin Monika, Mordyl Barbara, Żesławska Ewa, Nitek Wojciech, Partyka Anna, Buzun Kamila, Doroz-Płonka Agata, Wesołowska Anna, Bielawska Anna, Handzlik Jadwiga.

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IDT: 0000099851.

Autorzy: Ali Wesam, Spengler Gabriella, Kincses Annamaria, Nove Marta, Battistelli Cecilia, Latacz Gniewomir, Starek Małgorzata, Dąbrowska Monika, Honkisz-Orzechowska Ewelina, Romanelli Annalisa, Rasile Manuela Monica, Szymańska Ewa, Jacob Claus, Zwergel Clemens, Handzlik Jadwiga.

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Czasopismo: European Journal of Medicinal Chemistry

Szczegóły: 2020 : Vol. 200, id. art. 112435, il., bibliogr. 49 poz., abstr.

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Charakt. merytoryczna: praca oryginalna

Impact Factor: 6.514

Punktacja MeiN: 140.000

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Excel/Calc   36

IDT: 0000099501.

Autorzy: Podlewska Sabina, Latacz Gniewomir, Łażewska Dorota, Kieć-Kononowicz Katarzyna, Handzlik Jadwiga.

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Czasopismo: Bioorganic & Medicinal Chemistry Letters

Szczegóły: 2020 : Vol. 30, nr 11, id. art. 127147, il., bibliogr. 41 poz., abstr.

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Impact Factor: 2.823

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Excel/Calc   37

IDT: 0000100862.

Autorzy: Szczepańska Katarzyna, Kincses Annamária, Vincze Klaudia, Szymańska Ewa, Latacz Gniewomir, Kuder Kamil J., Stark Holger, Spengler Gabriella, Handzlik Jadwiga, Kieć-Kononowicz Katarzyna.

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Szczegóły: 2020 : Vol. 30, nr 22, id. art. 127522

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DOI: 10.1016/j.bmcl.2020.127522   Pobierz rekord
BibTeX
Excel/Calc   38
IDT: 0000100768.
Autorzy: Witek Karolina, Latacz Gniewomir, Kaczor Aneta, Czekajewska Joanna, Żesławska Ewa, Chudzik Anna, Karczewska Elżbieta, Nitek Wojciech, Kieć-Kononowicz Katarzyna, Handzlik Jadwiga.
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Czasopismo: Molecules
Szczegóły: 2020 : Vol. 25, nr 17, id. art. 3788, il., bibliogr. 30 poz., abstr.
Uwagi: Autor korespondencyjny: Jadwiga Handzlik.
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Punktacja MeiN: 140.000
DOI: 10.3390/molecules25173788   Pobierz rekord
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IDT: 0000100766.
Autorzy: Łażewska Dorota, Bajda Marek, Kaleta Maria, Zaręba Paula, Doroz-Płonka Agata, Siwek Agata, Alachkar Alaa, Mogilski Szczepan, Saad Ali, Kuder Kamil, Olejarz-Maciej Agnieszka, Godyń Justyna, Stary Dorota, Sudoł Sylwia, Więcek Małgorzata, Latacz Gniewomir, Walczak Maria, Handzlik Jadwiga, Sadek Bassem, Malawska Barbara, Kieć-Kononowicz Katarzyna.
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Szczegóły: 2020 : Vol. 207, id. art. 112743, il., bibliogr. 75 poz., abstr.
Uwagi: Autor korespondencyjny: Dorota Łażewska.
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Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 6.514
Punktacja MeiN: 140.000
DOI: 10.1016/j.ejmech.2020.112743   Pobierz rekord
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IDT: 0000100428.
Autorzy: Kaczor Aneta, Nove Marta, Kincses Annamaria, Spengler Gabriella, Szymańska Ewa, Latacz Gniewomir, Handzlik Jadwiga.
Tytuł oryginału: Search for ABCB1 Modulators Among 2-Amine-5-Arylideneimidazolones as a New Perspective to Overcome Cancer Multidrug Resistance.
Czasopismo: Molecules
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42
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43
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44
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Excel/Calc   45

IDT: 0000092496.

Autorzy: Żesławska Ewa, Kincses Annamária, Spengler Gabriella, Nitek Wojciech, Tejchman Waldemar, Handzlik Jadwiga.

Tytuł oryginału: Pharmacophoric features for a very potent 5-spirofluorenehydantoin inhibitor of cancer efflux pump ABCB1, based on X-ray analysis.

Excel/Calc   46

IDT: 0000094579.

Autorzy: Nasim Muhammad Jawad, Witek Karolina, Kincses Annamaria, Abdin Ahmad Yaman, Żesławska Ewa, Marc Małgorzata Anna, Gajdacs Mario, Spengler Gabriella, Nitek Wojciech, Latacz Gniewomir, Karczewska Elżbieta, Kiec-Kononowicz Katarzyna, Handzlik Jadwiga, Jacob Claus.

Tytuł oryginału: Pronounced activity of aromatic selenocyanates against multidrug resistant ESKAPE bacteria.

Excel/Calc   47

IDT: 0000094285.

Autorzy: Mosolygo Timea, Kincses Annamaria, Csonka Andrea, Tonki Adam Szabo, Witek Karolina, Sanmartin Carmen, Marć Małgorzata Anna, Handzlik Jadwiga, Kieć-Kononowicz Katarzyna, Dominguez-Alvarez Enrique, Spengler Gabriella.

Tytuł oryginału: Selenocompounds as Novel Antibacterial Agents and Bacterial Efflux Pump Inhibitors.

Excel/Calc 48
IDT: 0000092290.
Autorzy: Łażewska Dorota, Kurczab Rafał, Więcek Małgorzata, Satała Grzegorz, Kieć-Kononowicz Katarzyna, Handzlik Jadwiga.
Tytuł oryginału: Synthesis and computer-aided analysis of the role of linker for novel ligands of the 5-HT6 serotonin receptor among substituted 1,3,5-triazinylpiperazines.
Czasopismo: Bioorganic Chemistry
Szczegóły: 2019 : Vol. 84, s. 319-325, il., bibiliogr. 23 poz., abstr.
Uwagi: Autor korespondencyjny: Dorota Łażewska, Jadwiga Handzlik.
p-ISSN: 0045-2068
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 4.831
Punktacja MeiN: 100.000
DOI: 10.1016/j.bioorg.2018.11.046   Pobierz rekord
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Excel/Calc 49
IDT: 0000095064.
Autorzy: Ali Wesam, Więcek Małgorzata, Łażewska Dorota, Kurczab Rafał, Jastrzębska-Więsek Magdalena, Satała Grzegorz, Kucwaj-Brysz Katarzyna, Lubelska Annamaria, Głuch-Lutwin Monika, Mordyl Barbara, Siwek Agata, Nasim Muhammad Jawad, Partyka Anna, Sudoł Sylwia, Latacz Gniewomir, Wesołowska Anna, Kieć-Kononowicz Katarzyna, Handzlik Jadwiga.
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DOI: 10.1016/j.ejmech.2019.06.022   Pobierz rekord
BibTeX
Excel/Calc 50
IDT: 0000095692.
Autorzy: Latacz Gniewomir, Lubelska Annamaria, Jastrzębska-Więsek Magdalena, Partyka Anna, Marć Małgorzata Anna, Satała Grzegorz, Wilczyńska Daria, Kotańska Magdalena, Więcek Małgorzata, Kamińska Katarzyna, Wesołowska Anna, Kieć-Kononowicz Katarzyna, Handzlik Jadwiga.
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Szczegóły: 2019 : Vol. 20, nr 14, 3420, il., bibliogr. 47 poz., abstr.
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Uwagi: Autor korespondencyjny: Jadwiga Handzlik.
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Charakt. merytoryczna: praca oryginalna
Impact Factor: 4.556
Punktacja MeiN: 140.000
DOI: 10.3390/ijms20143420   Pobierz rekord
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Excel/Calc 51
IDT: 0000096303.
Autorzy: Dominguez-Alvarez Enrique, Łażewska Dorota, Szabo Zsanett, Hagenow Stefanie, Reiner David, Gajdacs Mario, Spengler Gabriella, Stark Holger, Handzlik Jadwiga, Kieć-Kononowicz Katarzyna.
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Szczegóły: 2019 : Vol. 4, nr 36, s. 10943-10952, il., bibliogr., abstr.
Uwagi: Autor korespondencyjny: E. Dominguez-Alvarez.

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DOI: 10.1002/slct.201902747

List of publications of Teacher dr hab.Mariusz Duplaga, prof. UJ:
IDT: 0000113975.
Autorzy: Kobryn Mateusz, Duplaga Mariusz.
Tytuł oryginału: Does health literacy protect against cyberchondria : : a cross-sectional study?
Czasopismo: Telemedicine Jurnal and e-Health
Szczegóły: 2023
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BibTeX
Excel/Calc   2
IDT: 0000110115.
Autorzy: Turcza Pawel, Duplaga Mariusz.
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Czasopismo: Circuits, Systems, and Signal Processing
Szczegóły: 2023 : Vol. 42, nr 2, s. 683-704, il., bibliogr 52 poz., abstr.
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DOI: 10.1007/s00034-022-02149-6   Pobierz rekord
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IDT: 0000114009.
Autorzy: Młoźniak Iwona, Zwierczyk Urszula, Rzepecka Elżbieta, Kobryn Mateusz, Wilk Marta, Duplaga Mariusz.
Tytuł oryginału: Manifestation of health denialism in attitudes toward COVID-19 vaccination : a qualitative study
Czasopismo: Vaccines
Szczegóły: 2023 : Vol. 11, nr 12, id. art. 1822, bibliogr. 50 poz., abstr.
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DOI: 10.3390/vaccines11121822   Pobierz rekord
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Excel/Calc   4
IDT: 0000112645.
Autorzy: Dopelt Keren, Shevach Itamar, Vardimon Ofek Eliad, Czabanowska Katarzyna, de Nooijer Jascha, Otok Robert, Leighton Lore, Bashkin Osnat, Duplaga Mariusz, Levine Hagai, MacLeod Fiona, Malowany Maureen, Okenwa-Emegwa Leah,

Zelber-Sagi Shira, Davidovitch Nadav, Barach Paul.
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Czasopismo: Frontiers in Public Health
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DOI: 10.3389/fpubh.2023.1202598   Pobierz rekord
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IDT: 0000111721.
Autorzy: Kowalska-Duplaga Kinga, Duplaga Mariusz.
Tytuł oryginału: The association of conspiracy beliefs and the uptake of COVID-19 vaccination : a cross-sectional study
Czasopismo: BMC Public Health
Szczegóły: 2023 : Vol. 23, nr 1, id. art. 672, il., bibliogr., abstr.
Uwagi: Autor korespondencyjny: Mariusz Duplaga
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DOI: 10.1186/s12889-023-15603-0   Pobierz rekord
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Excel/Calc   6
IDT: 0000113764.
Autorzy: Zwierczyk Urszula, Kobryn Mateusz, Duplaga Mariusz.
Tytuł oryginału: The awareness of the role of commercial determinants of health and the readiness to accept restrictions on unhealthy food advertising in Polish society
Czasopismo: Nutrients
Szczegóły: 2023 : Vol. 15, nr 22, id. art. 4743, bibliogr. 63 poz., abstr.
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IDT: 0000108757.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: A nationwide natural experiment of e-Health implementation during the COVID-19 pandemic in Poland : user satisfaction and the ease-of-use of remote physician's visits
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2022 : Vol. 19, nr 14, id. art. 8338, il., bibliogr., abstr.
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DOI: 10.3390/ijerph19148338   Pobierz rekord

BibTeX
Excel/Calc   8
IDT: 0000109950.
Autorzy: Zwierczyk Urszula, Sowada Christoph, Duplaga Mariusz.
Tytuł oryginału: Eating choices - the roles of motivation and health literacy : a cross-sectional study
Czasopismo: Nutrients
Szczegóły: 2022 : Vol. 14, nr 19, id. art. 4026, il., bibliogr., abstr.
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DOI: 10.3390/nu14194026   Pobierz rekord
BibTeX
Excel/Calc   9
IDT: 0000109960.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: Edukacja zdrowotna. [W: Promocja zdrowia i oświata zdrowotna].
Tytuł całości: W: Zdrowie publiczne : wymiar społeczny i ekologiczny
Odpowiedzialni: redakcja, tłum.: redakcja naukowa Stanisława Golinowska, Jacek Czepiel, Alicja Domagała, Mariusz Duplaga, Tomasz Grodzicki, Janusz Hałuszka, Grażyna Jasieńska, Justyna Klingemann, Iwona Kowalska-Bobko, Andrzej Ryś, Monika Ścibor, Marzena Tambor, Beata Tobiasz-Adamczyk, Piotr Tyszko
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p-ISBN: 978-83-66849-18-1
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Punktacja MeiN: 20.000   Pobierz rekord
BibTeX
Excel/Calc   10
IDT: 0000109911.
Autorzy: Bashkin Osnat, Otok Robert, Leighton Lore, Czabanowska Kasia, Barach Paul, Davidovitch Nadav, Dopelt Keren, Duplaga Mariusz, Okenwa Emegwa Leah, MacLeod Fiona, Neumark Yehuda, Raz Maya Peled, Tulchinsky Theodore, Mor Zohar.
Tytuł oryginału: Emerging lessons from the COVID-19 pandemic about the decisive competencies needed for the public health workforce : A qualitative study
Czasopismo: Frontiers in Public Health
Szczegóły: 2022 : Vol. 10, id. art. 990353, il., bibliogr. 39 poz.
Uwagi: Open Access Creative Commons Attribution License CC-BY 4.0
Uwagi: Autor korespondencyjny: Osnat Bashkin
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DOI: 10.3389/fpubh.2022.990353   Pobierz rekord
BibTeX
Excel/Calc   11
IDT: 0000107143.
Autorzy: Wasilewska Agata, Ponanta-Gawron Katarzyna, Burtan Beata, Stephen Chandra Sagaran Charissa, Duplaga Mariusz, Kowalska-Duplaga Kinga.
Tytuł oryginału: Exclusive enteral nutrition remission induction treatment influence on transient hypertransaminasemia in children with newly onset Crohn's disease.
Czasopismo: Journal of Medicinal Food
Szczegóły: 2022 : Vol. 25, nr 4, s. 402-407, bibliogr. 27 poz., abstr.
Uwagi: Autor korespondencyjny: Agata Wasilewska.
p-ISSN: 1096-620X

BibTeX
Excel/Calc   12
IDT: 0000110914.
Autorzy: Bashkin Osnat, Otok Robert, Kapra Ori, Czabanowska Kasia, Barach Paul, Baron-Epel Orna, Dopelt Keren, Duplaga Mariusz, Leighton Lore, Levine Hagai, MacLeod Fiona, Neumark Yehuda, Pillard-Borg Stephanie, Tulchinsky Theodore, Mor Zohar.
Tytuł oryginału: Identifying the gaps between public health training and practice : a workforce competencies comparative analysis
Czasopismo: International Journal of Public Health
Szczegóły: 2022 : Vol. 67, id. art. 1605303, il., bibliogr. 21 poz.
Uwagi: Open Access Creative Commons Attribution License CC-BY 4.0
Uwagi: Autor korespondencyjny: Osnat Bashkin
BibTeX
Excel/Calc   13
IDT: 0000109958.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: Interwencje promocji zdrowia. [W: Promocja zdrowia i oświata zdrowotna].
Tytuł całości: W: Zdrowie publiczne : wymiar społeczny i ekologiczny
Odpowiedzialni: redakcja, tłum.: redakcja naukowa Stanisława Golinowska, Jacek Czepiel, Alicja Domagała, Mariusz Duplaga, Tomasz Grodzicki, Janusz Hałuszka, Grażyna Jasieńska, Justyna Klingemann, Iwona Kowalska-Bobko, Andrzej Ryś, Monika Ścibor, Marzena Tambor, Beata Tobiasz-Adamczyk, Piotr Tyszko
Adres wydawniczy: Warszawa : Wydawnictwo Naukowe Scholar, 2022
Opis fizyczny: s. 792-806 : bibliogr.
Uwagi: Rozdział 47
BibTeX
Excel/Calc   14
IDT: 0000109959.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: Komunikacja zdrowotna. [W: Promocja zdrowia i oświata zdrowotna].
Tytuł całości: W: Zdrowie publiczne : wymiar społeczny i ekologiczny
Odpowiedzialni: redakcja, tłum.: redakcja naukowa Stanisława Golinowska, Jacek Czepiel, Alicja Domagała, Mariusz Duplaga, Tomasz Grodzicki, Janusz Hałuszka, Grażyna Jasieńska, Justyna Klingemann, Iwona Kowalska-Bobko, Andrzej Ryś, Monika Ścibor, Marzena Tambor, Beata Tobiasz-Adamczyk, Piotr Tyszko
Adres wydawniczy: Warszawa : Wydawnictwo Naukowe Scholar, 2022
Opis fizyczny: s. 807-820 : bibliogr.
Uwagi: Rozdział 48
BibTeX
Excel/Calc   15
IDT: 0000109961.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: Kształtowanie zdrowego stylu życia. [W: Promocja zdrowia i oświata zdrowotna].

Tytuł całości: W: Zdrowie publiczne : wymiar społeczny i ekologiczny

Odpowiedzialni: redakcja, tłum.: redakcja naukowa Stanisława Golinowska, Jacek Czepiel, Alicja Domagała, Mariusz Duplaga, Tomasz Grodzicki, Janusz Hałuszka, Grażyna Jasieńska, Justyna Klingemann, Iwona Kowalska-Bobko, Andrzej Ryś, Monika Ścibor, Marzena Tambor, Beata Tobiasz-Adamczyk, Piotr Tyszko

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IDT: 0000109962.

Autorzy: Duplaga Mariusz, Kowalska-Duplaga Kinga.

Tytuł oryginału: Promocja szczepień ochronnych. [W: Promocja zdrowia i oświata zdrowotna].

Tytuł całości: W: Zdrowie publiczne : wymiar społeczny i ekologiczny

Odpowiedzialni: redakcja, tłum.: redakcja naukowa Stanisława Golinowska, Jacek Czepiel, Alicja Domagała, Mariusz Duplaga, Tomasz Grodzicki, Janusz Hałuszka, Grażyna Jasieńska, Justyna Klingemann, Iwona Kowalska-Bobko, Andrzej Ryś, Monika Ścibor, Marzena Tambor, Beata Tobiasz-Adamczyk, Piotr Tyszko

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IDT: 0000109957.

Autorzy: Duplaga Mariusz.

Tytuł oryginału: Promocja zdrowia. Geneza, koncepcja i definicje. [W: Promocja zdrowia i oświata zdrowotna].

Tytuł całości: W: Zdrowie publiczne : wymiar społeczny i ekologiczny

Odpowiedzialni: redakcja, tłum.: redakcja naukowa Stanisława Golinowska, Jacek Czepiel, Alicja Domagała, Mariusz Duplaga, Tomasz Grodzicki, Janusz Hałuszka, Grażyna Jasieńska, Justyna Klingemann, Iwona Kowalska-Bobko, Andrzej Ryś, Monika Ścibor, Marzena Tambor, Beata Tobiasz-Adamczyk, Piotr Tyszko

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IDT: 0000110327.

Autorzy: Duplaga Mariusz, Zwierczyk Urszula, Kowalska-Duplaga Kinga.

Tytuł oryginału: The Assessment of the reliability and validity of the Polish version of the Adult Vaccine Hesitancy Scale (PL-aVHS) in the context of attitudes toward COVID-19 vaccination.

Czasopismo: Vaccines

Szczegóły: 2022 : Vol. 10, nr 10, id. art. 1666, il., bibliogr. 41 poz., abstr.

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Punktacja MeiN: 140.000

DOI: 10.3390/vaccines10101666   Pobierz rekord

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Excel/Calc   19

IDT: 0000108758.

Autorzy: Duplaga Mariusz.
Tytuł oryginału: The roles of health and e-Health literacy, conspiracy beliefs and political sympathy in the adherence to preventive measures recommended during the pandemic
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2022 : Vol. 19, nr 14, id. art. 8346, il., bibliogr., abstr.
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BibTeX
Excel/Calc   20
IDT: 0000107078.
Autorzy: Duplaga Mariusz, Grysztar Marcin.
Tytuł oryginału: The use of e-cigarettes among high school students in Poland is associated with health locus of control but not with health literacy : A cross-sectional study.
Czasopismo: Toxics
Szczegóły: 2022 : Vol. 10, nr 1, id. art. 41, bibliogr., 54 poz., abstr.
Uwagi: Autor korespondencyjny: Mariusz Duplaga.
e-ISSN: 2305-6304
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Punktacja MeiN: 70.000
DOI: 10.3390/toxics10010041   Pobierz rekord
BibTeX
Excel/Calc   21
IDT: 0000110475.
Autorzy: Duplaga Mariusz, Turosz Natalia.
Tytuł oryginału: User satisfaction and the readiness-to-use e-health applications in the future in Polish society in the early phase of the COVID-19 pandemic : a cross-sectional study
Czasopismo: International Journal of Medical Informatics
Szczegóły: 2022 : Vol. 168, 104904, bibliogr. 51 poz., abstr.
Uwagi: Autor korespondencyjny: Mariusz Duplaga, Natalia Turosz
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DOI: 10.1016/j.ijmedinf.2022.104904   Pobierz rekord
BibTeX
Excel/Calc   22
IDT: 0000109330.
Autorzy: Zwierczyk Urszula, Kobryn Mateusz, Duplaga Mariusz.
Tytuł oryginału: Validation of the short food literacy questionnaire in the representative sample of Polish internet users.
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2022 : Vol. 19, nr 15, id. art. 9710, il., bibliogr. 45 poz., abstr.
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Tytuł oryginału: Zdrowie publiczne : wymiar społeczny i ekologiczny

Odpowiedzialni: redakcja, tłum.: redakcja naukowa Stanisława Golinowska, Jacek Czepiel, Alicja Domagała, Mariusz Duplaga, Tomasz Grodzicki, Janusz Hałuszka, Grażyna Jasieńska, Justyna Klingemann, Iwona Kowalska-Bobko, Andrzej Ryś, Monika Ścibor, Marzena Tambor, Beata Tobiasz-Adamczyk, Piotr Tyszko

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Autorzy: Kozioł-Kozakowska Agnieszka, Salamon Dominika, Grzenda-Adamek Zofia, Krawczyk Agnieszka, Duplaga Mariusz, Gosiewski Tomasz, Kowalska-Duplaga Kinga.

Tytuł oryginału: Changes in diet and anthropometric parameters in children and adolescents with celiac disease - one year of follow-up

Czasopismo: Nutrients

Szczegóły: 2021 : Vol. 13, nr 12, id. art. 4306, il., bibliogr. 50 poz., abstr.

Uwagi: Autor korespondencyjny: Kinga Kowalska-Duplaga

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IDT: 0000104947.

Autorzy: Kobryn Mateusz, Duplaga Mariusz.

Tytuł oryginału: Cyberchondria as a by-product of extensive use of health-related information on the internet.

Czasopismo: Zeszyt Naukowy.pl

Szczegóły: 2021, nr 58, s. 26-39, bibliogr. 60 poz., streszcz.

Uwagi: Tyt. poprzedni: Zeszyt Naukowy (Wyższa Szkoła Zarządzania i Bankowości w Krakowie) [ISSN 1897-659X]

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Excel/Calc   26

IDT: 0000104945.

Autorzy: Romaszewski Artur, Kielar Mariusz, Jakubowski Szczepan, Duplaga Mariusz.

Tytuł oryginału: Część II - Dane o stanie zdrowia w świetle nowych wyzwań technicznych, prawnych i organizacyjnych - wybrane zagadnienia.

Czasopismo: Zeszyt Naukowy.pl

Szczegóły: 2021, nr 58, s. 13-25, bibliogr. 17 poz., streszcz.

Uwagi: Tyt. poprzedni: Zeszyt Naukowy (Wyższa Szkoła Zarządzania i Bankowości w Krakowie) [ISSN 1897-659X]

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IDT: 0000104944.
Autorzy: Romaszewski Artur, Duplaga Mariusz, Jakubowski Szczepan.
Tytuł oryginału: Dane o stanie zdrowia w nowych rozwiązaniach prawnych i dokumentach strategicznych Polski I Unii Europejskiej.
Czasopismo: Zeszyt Naukowy.pl
Szczegóły: 2021, nr 58, s. 1-12, bibliogr. 21 poz., streszcz.
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IDT: 0000105412.
Autorzy: Kowalska-Duplaga Kinga, Gawlik-Scislo Anita, Krzesiek Elzbieta, Jarocka-Cyrta Elzbieta, Łazowska-Przeorek Izabella, Duplaga Mariusz, Banaszkiewicz Aleksandra.
Tytuł oryginału: Determinants of disease-specific knowledge among children with inflammatory bowel disease and their parents : A multicentre study.
Czasopismo: World Journal of Gastroenterology
Szczegóły: 2021 : Vol. 27, nr 27, s. 4468-4480, bibliogr. 27 poz., abstr.
Uwagi: Autor korespondencyjny: Aleksandra Banaszkiewicz.
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DOI: 10.3748/wjg.v27.i27.4468   Pobierz rekord
BibTeX
Excel/Calc   29
IDT: 0000107500.
Autorzy: Zwierczyk Urszula, Duplaga Mariusz.
Tytuł oryginału: Nutrition and food literacy - concept, measurement methods, determinants, and meaning
Czasopismo: Problemy Pielęgniarstwa
Szczegóły: 2021 : T. 29, nr 2, s. 79-84, il., bibliogr. 42 poz., abstr.
Uwagi: Autor korespondencyjny: Urszula Zwierczyk
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DOI: 10.5114/ppiel.2021.113788   Pobierz rekord
BibTeX
Excel/Calc   30
IDT: 0000106727.
Autorzy: Duplaga Mariusz, Grysztar Marcin.
Tytuł oryginału: Nutritional behaviors, health literacy, and health locus of control of secondary schoolers in southern Poland : a cross-sectional study
Czasopismo: Nutrients
Szczegóły: 2021 : Vol. 13, nr 12, id. art. 4323, bibliogr. 66 poz., abstr.
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DOI: 10.3390/nu13124323   Pobierz rekord
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Excel/Calc   31
IDT: 0000106400.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: Patient empowerment in Health 4.0
Tytuł całości: W: The digital transformation of healthcare : Health 4.0
Odpowiedzialni: redakcja, tłum.: Edited By Marek Ćwiklicki, Mariusz Duplaga, Jacek Klich
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Uwagi: Chapter 5
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Punktacja MeiN: 50.000   Pobierz rekord
BibTeX
Excel/Calc   32
IDT: 0000106402.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: People with disabilities in the information society
Tytuł całości: W: The digital transformation of healthcare : Health 4.0
Odpowiedzialni: redakcja, tłum.: Edited By Marek Ćwiklicki, Mariusz Duplaga, Jacek Klich
Adres wydawniczy: London : Routledge, 2021
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Punktacja MeiN: 50.000   Pobierz rekord
BibTeX
Excel/Calc   33
IDT: 0000106474.
Autorzy: Duplaga Mariusz, Grysztar Marcin.
Tytuł oryginału: Socio-economic determinants of health literacy in high school students : a cross-sectional study
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2021 : Vol. 18, nr 22, id. art. 12231, il., bibliogr. 46 poz., abstr.
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Autorzy: Duplaga Mariusz, Jakubowski Szczepan.
Tytuł oryginału: Technologies enhancing Health 4.0
Tytuł całości: W: The digital transformation of healthcare : Health 4.0
Odpowiedzialni: redakcja, tłum.: Edited By Marek Ćwiklicki, Mariusz Duplaga, Jacek Klich
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BibTeX
Excel/Calc   35
IDT: 0000103183.
Autorzy: Duplaga Mariusz, Grysztar Marcin.
Tytuł oryginału: The Association between Future Anxiety, Health Literacy and the Perception of the COVID-19 Pandemic : A Cross-Sectional Study.
Czasopismo: Healthcare
Szczegóły: 2021 : Vol. 9, nr 1, id. art. 43, il., bibliogr. 112 poz., abstr.
Uwagi: Autor korespondencyjny: Mariusz Duplaga.
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p-ISSN: 2227-9032
Charakt. formalna: artykuł zagraniczny
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Impact Factor: 3.160
Punktacja MeiN: 40.000
DOI: 10.3390/healthcare9010043   Pobierz rekord
BibTeX
Excel/Calc   36
IDT: 0000104452.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: The association between Internet use and health-related outcomes in older adults and the elderly : a cross-sectional study.
Czasopismo: BMC Medical Informatics and Decision Making
Szczegóły: 2021 : Vol. 21, id. art. 150, bibliogr. 75 poz., abstr.
Uwagi: Autor korespondencyjny: Mariusz Duplaga.
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e-ISSN: 1472-6947
Charakt. formalna: artykuł zagraniczny
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Impact Factor: 3.298
Punktacja MeiN: 70.000
DOI: 10.1186/s12911-021-01500-2   Pobierz rekord
BibTeX
Excel/Calc   37
IDT: 0000106396.
Tytuł oryginału: The digital transformation of healthcare : Health 4.0
Odpowiedzialni: redakcja, tłum.: Edited By Marek Ćwiklicki, Mariusz Duplaga, Jacek Klich
Adres wydawniczy: London : Routledge, 2021
Opis fizyczny: 244 s. : il. - bibliogr.
e-ISBN: 978-1-003-1444-0-3
Charakt. formalna: monografia zagraniczna (red.)
Charakt. merytoryczna: redakcja
Punktacja MeiN: 100.000   Pobierz rekord
BibTeX
Excel/Calc   38
IDT: 0000105875.
Autorzy: Bashkin Osnat, Dopelt Keren, Mor Zohar, Leighton Lore, Otok Robert, Duplaga Mariusz, MacLeod Fiona, de Nooijer Jascha, Neumark Yehuda, Paillard-Borg Stephanie, Tulchinsky Theodore, Zelber-Sagi Shira, Davidovitch Nadav.
Tytuł oryginału: The future public health workforce in a changing world : a conceptual framework for a European-Israeli Knowledge Transfer Project.
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2021 : Vol. 18, nr 17, id. art. 9265, il., bibliogr. 25 poz., abstr.
Uwagi: Autor korespondencyjny: Osnat Bashkin.
Uwagi: Open Access Creative Commons Attribution License CC-BY 4.0.
p-ISSN: 1661-7827

Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 4.614
Punktacja MeiN: 140.000
DOI: 10.3390/ijerph18179265   Pobierz rekord
BibTeX
Excel/Calc   39
IDT: 0000106399.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: The landscape of Health 4.0
Tytuł całości: W: The digital transformation of healthcare : Health 4.0
Odpowiedzialni: redakcja, tłum.: Edited By Marek Ćwiklicki, Mariusz Duplaga, Jacek Klich
Adres wydawniczy: London : Routledge, 2021
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Uwagi: Chapter 4
e-ISBN: 978-1003-1444-0-3
Charakt. formalna: rozdział monografii zagranicznej
Charakt. merytoryczna: praca oryginalna
Punktacja MeiN: 50.000   Pobierz rekord
BibTeX
Excel/Calc   40
IDT: 0000106397.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: The transition from telemedicine and e-health to Health 4.0
Tytuł całości: W: The digital transformation of healthcare : Health 4.0
Odpowiedzialni: redakcja, tłum.: Edited By Marek Ćwiklicki, Mariusz Duplaga, Jacek Klich
Adres wydawniczy: London : Routledge, 2021
Opis fizyczny: [s. 1-14] : bibliogr.
Uwagi: Chapter 2
e-ISBN: 978-1003-1444-0-3
Charakt. formalna: rozdział monografii zagranicznej
Charakt. merytoryczna: praca oryginalna
Punktacja MeiN: 50.000   Pobierz rekord
BibTeX
Excel/Calc   41
IDT: 0000104946.
Autorzy: Sobecka-Wajdzik Agata, Duplaga Mariusz.
Tytuł oryginału: Zastosowanie telemedycyny w stomatologii.
Czasopismo: Zeszyt Naukowy.pl
Szczegóły: 2021, nr 58, s. 40-51, bibliogr. 32 poz., streszcz.
Uwagi: Tyt. poprzedni: Zeszyt Naukowy (Wyższa Szkoła Zarządzania i Bankowości w Krakowie) [ISSN 1897-659X]
Uwagi: Autor korespondencyjny: Agata Sobecka-Wajdzik, Mariusz Duplaga.
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Charakt. formalna: artykuł polski
Charakt. merytoryczna: praca poglądowa
Punktacja MeiN: 5.000   Pobierz rekord
BibTeX
Excel/Calc   42
IDT: 0000098417.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: Determinants and Consequences of Limited Health Literacy in Polish Society.
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2020 : Vol. 17, nr 2, id. art. 642, bibliogr. 43 poz., abstr.
Uwagi: Open Access Creative Commons Attribution License CC-BY 4.0.
Uwagi: Autor korespondencyjny: Mariusz Duplaga.
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Punktacja MeiN: 140.000
DOI: 10.3390/ijerph17020642   Pobierz rekord
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Excel/Calc   43
IDT: 0000099836.
Autorzy: Salamon Dominika, Gosiewski Tomasz, Krawczyk Agnieszka, Sroka-Oleksiak Agnieszka, Duplaga Mariusz, Fyderek Krzysztof, Kowalska-Duplaga Kinga.
Tytuł oryginału: Quantitative changes in selected bacteria in the stool during the treatment of Crohn's disease.
Czasopismo: Advances in Medical Sciences
Szczegóły: 2020 : Vol. 65, nr 2, s. 348-353, bibliogr. 30 poz., abstr.
Uwagi: Autor korespondencyjny: Kinga Kowalska-Duplaga.
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p-ISSN: 1896-1126
Charakt. formalna: artykuł polski
Charakt. merytoryczna: praca oryginalna
Impact Factor: 3.287
Punktacja MeiN: 100.000
DOI: 10.1016/j.advms.2020.06.003   Pobierz rekord
BibTeX
Excel/Calc   44
IDT: 0000100658.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: The Acceptance of Key Public Health Interventions by the Polish Population Is Related to Health Literacy, But Not eHealth Literacy.
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2020 : Vol. 17, nr 15, id. art. 5459, bibliogr. 71 poz., abstr.
Uwagi: Open Access Creative Commons Attribution License CC-BY 4.0.
Uwagi: Autor korespondencyjny: Mariusz Duplaga.
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Impact Factor: 3.390
Punktacja MeiN: 140.000
DOI: 10.3390/ijerph17155459   Pobierz rekord
BibTeX
Excel/Calc   45
IDT: 0000101933.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: The Determinants of Conspiracy Beliefs Related to the COVID-19 Pandemic in a Nationally Representative Sample of Internet Users.
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2020 : Vol. 17, nr 21, id. art. 7818, bibliog. 65 poz., abstr.
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Charakt. merytoryczna: praca oryginalna
Impact Factor: 3.390
Punktacja MeiN: 140.000
DOI: 10.3390/ijerph17217818   Pobierz rekord
BibTeX
Excel/Calc   46
IDT: 0000100897.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: The Use of Fitness Influencers Websites by Young Adult Women : A Cross-Sectional Study.
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2020 : Vol. 17, nr 17, id. art. 6360, bibliogr.78 poz., abstr.

Uwagi: Autor korespondencyjny: Mariusz Duplaga.
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 3.390
Punktacja MeiN: 140.000
Pobierz rekord
BibTeX
Excel/Calc   47
IDT: 0000079982.
Autorzy: Turcza P[aweł], Duplaga M[ariusz].
Tytuł oryginału: Energy-efficient image compression algorithm for high-frame rate multi-view wireless capsule endoscopy.
Czasopismo: Journal of Real-time Image Processing
Szczegóły: 2019 : Vol. 16, nr 5, s. 1425-1437, il., bibliogr. 39 poz., abstr.
Uwagi: Autor korespondencyjny: Paweł Turcza.
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 1.968
Punktacja MeiN: 70.000
Pobierz rekord
BibTeX
Excel/Calc   48
IDT: 0000097870.
Autorzy: Duplaga Mariusz, Szulc Katarzyna.
Tytuł oryginału: Ewolucja zastosowań systemów teleinformatycznych w ochronie zdrowia : od telemedycyny do zdrowia 2.0.
Czasopismo: Zeszyt Naukowy.pl
Szczegóły: 2019, nr 53, s. 14-25, bibliogr. 23 poz., streszcz.
Uwagi: Tyt. poprzedni: Zeszyt Naukowy (Wyższa Szkoła Zarządzania i Bankowości w Krakowie) [ISSN 1897-659X]
Uwagi: Autor korespondencyjny: Mariusz Duplaga, Katarzyna Szulc.
Charakt. formalna: artykuł polski
Charakt. merytoryczna: praca poglądowa
Punktacja MeiN: 5.000   Pobierz rekord
BibTeX
Excel/Calc   49
IDT: 0000093986.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: Perception of the Effectiveness of Health-Related Campaigns among the Adult Population: An Analysis of Determinants.
Czasopismo: International Journal of Environmental Research and Public Health
Szczegóły: 2019 : Vol. 16, nr 5 art. no. 791, s. 1-14, bibliogr. 38 poz., abstr.
Uwagi: Autor korespondencyjny: Mariusz Duplaga.
Charakt. formalna: artykuł zagraniczny
Charakt. merytoryczna: praca oryginalna
Impact Factor: 2.849
Punktacja MeiN: 140.000
Pobierz rekord
BibTeX
Excel/Calc   50
IDT: 0000097591.
Autorzy: Romaszewski Artur, Trąbka Wojciech, Jakubowski Szczepan, Kielar Mariusz, Duplaga Mariusz, Kopański Zbigniew, Machota Małgorzata.
Tytuł oryginału: Processing of medical data in the light of new technological and legal challenges.

BibTeX
Excel/Calc   51
IDT: 0000097869.
Autorzy: Duplaga Mariusz, Szulc Katarzyna.
Tytuł oryginału: Telemonitorowanie w chorobach przewlekłych : dostępne rozwiązania i przegląd badań nad skutecznością.
BibTeX
Excel/Calc   52
IDT: 0000096141.
Autorzy: Duplaga Mariusz, Szulc Katarzyna.
Tytuł oryginału: The Association of Internet Use with Wellbeing, Mental Health and Health Behaviours of Persons with Disabilities.
BibTeX
Excel/Calc   53
IDT: 0000096135.
Autorzy: Duplaga Mariusz, Sobecka Karolina, Wójcik Sylwia.
Tytuł oryginału: The Reliability and Validity of the Telephone-Based and Online Polish eHealth Literacy Scale Based on Two Nationally Representative Samples.
BibTeX
Excel/Calc   54
IDT: 0000098462.
Autorzy: Duplaga Mariusz.
Tytuł oryginału: Wsparcie telemedyczne w chorobach układu oddechowego. [W: Systemy telemedyczne].

Tytuł całości: W: Informatyka w medycynie.

Odpowiedzialni: redakcja, tłum.: redaktorzy tomu Marek Kurzyński, Leon Bobrowski, Antoni Nowakowski, Jacek Rumiński.

Adres wydawniczy: [Warszawa] : Akademicka Oficyna Wydawnicza EXIT, copyright 2019.

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Uwagi: 24 cm.

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Charakt. merytoryczna: praca oryginalna

Punktacja MeiN: 20.000   Pobierz rekord

BibTeX

Excel/Calc   55

IDT: 0000098461.

Autorzy: Duplaga Mariusz.

Tytuł oryginału: Zdrowie publiczne i promocja zdrowia w środowisku e-zdrowia. [W: Informatyka medyczna jako dyscyplina naukowa i sfera usługowa na rzecz ochrony zdrowia i środowiska].

Tytuł całości: W: Informatyka w medycynie.

Odpowiedzialni: redakcja, tłum.: redaktorzy tomu Marek Kurzyński, Leon Bobrowski, Antoni Nowakowski, Jacek Rumiński.

Adres wydawniczy: [Warszawa] : Akademicka Oficyna Wydawnicza EXIT, copyright 2019.

Opis fizyczny: 11-28 : bibliogr. 101 poz.

Uwagi: 24 cm.

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Charakt. formalna: rozdział monografii polskiej

Charakt. merytoryczna: praca oryginalna

Punktacja MeiN: 20.000

JAGIELLONIAN UNIVERSITY
MEDICAL COLLEGE

Regression models in biomedical science
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 3	Examination graded credit Activities and hours classes: 20	Number of ECTS points 2.0

Goals

C1	This course allows students to understand methods of chosing, building, verification and interpretation of regression models the most often used in biomedical sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	rules of the performing of statistical analysis, testing of associations and the choice of the proper statistical method to be used;	SD_W01, SD_W09	assignment report

Code	Outcomes in terms of	Effects	Examination methods
W2	the rules of model building and validation (linear regression, logisc\tic regression, Coc proportional hazards model);	SD_W01, SD_W09	assignment report
W3	the rules of the interpretation of the results from uni- and multivariable statisy\tical analyses;	SD_W01, SD_W09	assignment report
W4	the rules of the results' presentation (both uni- and multivariable models) in scientific papers.	SD_W01, SD_W09	assignment report
Skills – PhD student can:			
U1	chose and perform the proper statistical test to assess between-groups differences, including paired samples and more than two d\study groups comparisons;	SD_U01, SD_U13	classroom observation, assignment report
U2	chose the proper model of regression (type of regression, independent variables)	SD_U01, SD_U13	classroom observation, assignment report
U3	perform the linear regression analysis, and validate the quality of the model	SD_U01, SD_U13	classroom observation, assignment report
U4	perform the logistic regression analysis, and validate the quality of the model	SD_U01, SD_U13	classroom observation, assignment report
U5	perform the survival analysis, and validate the quality of the model	SD_U01, SD_U13	classroom observation, assignment report
U6	interpret and present in the proper way cthe results of statistical analyses.	SD_U01, SD_U06, SD_U11	classroom observation, assignment report
Social competences – PhD student is ready to:			
K1	critical assesment of results of the research effort of his/her own as well as other researchers.	SD_K01	classroom observation, assignment report
K2	recognition and usage of the achievements of other disciplines in his/her research work.	SD_K08, SD_K09	classroom observation, assignment report

Calculation of ECTS points

Activity form	Activity hours*
classes	20
preparation of a project	30
independent education	10

PhD student workload	**Hours** 60
Workload involving teacher	**Hours** 20

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Statistical tests for between-groups comparisons, including repeated measures.	W1, W4, U1, U6, K1, K2	classes
2.	Analysis of variance - uni- and multivariable models;	W1, W3, W4, U1, U6, K1, K2	classes
3.	Linear regression - model building and validation, godness of fit, data presentation and interpretation of the results;	W1, W2, W3, W4, U2, U3, U6, K1, K2	classes
4.	Logistic regression - - model building and validation, godness of fit, data presentation and interpretation of the results;	W1, W2, W3, W4, U2, U4, U6, K1, K2	classes
5.	Survival analysis - model building and validation, godness of fit, data presentation and interpretation of the results;	W1, W2, W3, W4, U2, U5, U6, K1, K2	classes

Course advanced

Teaching methods :

computer classes, discussion, problem solving method, case study method

Activities	Examination methods	Credit conditions
classes	classroom observation, assignment report	practical assignements - each required assignement should be scored minimum 50%. To receive the final credit the average (aritmetic mean) from all assigm\nements should be at least 60%. The active involvement is required during the classess to receive credit.

Additional info

To receive credit student have to achieve the minimum of 60% from the final score (average of all required practical assignements), in addition for each single assignement the minimum of 50% have to be achieved.

The final grade is based on the arithmetic mean of all practical assignements (scored 0-100 each). The scoring system for the final grade:
   92,0-100,0   - Very Good (5.0)   84,0 - 91,9   - Good plus (4.5)   76,0 – 83,9   - Good (4.0)   68,0 – 75,9 - Satisfactory plus (3.5)   60,0 – 67,9 - Satisfactory (3.0)   <60,0   - Unsatisfactory (Failed) (2.0)
The make-up in credit is based on the same rules.

Entry requirements

Knowledge of statistical concepts and classical statistical tests for between-groups comparisons.

Linking with research conducted at the university

Examples of research stuies conducted in Chair of Epidemiology and Preventive Medicine:
"Badania nad wpływem zanieczyszczenia powietrza na zdrowie oraz korzyściami płynącymi z polityki poprawy jakości powietrza atmosferycznego w Krakowie" - the project with Columbia University, New York; principal investigator for the Polish part dr hab. Agnieszka Pac (2015-2021)
Environmental Health Research in Poland: Preventing Risk to Children From Environmental Exposures and Air Pollution - - the project with Columbia University, New York; principal investigator for the Polish part dr hab. Agnieszka Pac (2021)
EXPANSE: EXposome Powered tools for healthy living in urbAN Settings - Horizon2020; partner from JU" dr hab. Agnieszka

Pac (2020-2024)

Chosen publications:

Pac A, Tobiasz-Adamczyk B, Błędowski P, Skalska A, Szybalska A, Zdrojewski T, Więcek A, Chudek J, Michel JP, Grodzicki T. Influence of Sociodemographic, Behavioral and Other Health-Related Factors on Healthy Ageing Based on Three Operative Definitions. J Nutr Health Aging. 2019;23(9):862-869. doi: 10.1007/s12603-019-1243-5.

Multidimensional models in data analysis
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 3	**Examination** graded credit **Activities and hours** classes: 20	**Number of ECTS points** 2.0

Goals

C1	Extending knowledge of statistical methods used in biomedical sciences towards more advanced analytical techniques and mastering the skills of their implementation in a statistical package. The lectures are intended to significantly support the student learning process in the area of data analysis and interpretation of the results for the needs of their scientific research.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	basics of statistical inference and criteria for selecting statistical tests appropriate to the research problems posed	SD_W01	written credit

Code	Outcomes in terms of	Effects	Examination methods
W2	main development trends in scientific disciplines important for education in the field of medical and health sciences	SD_W09	written credit
Skills – PhD student can:			
U1	using the acquired knowledge, critically analyze and evaluate the results of scientific research in the area of the represented scientific discipline and own contribution to the development of this discipline, formulate new solutions to problems within existing and modified methodological paradigms; creatively apply and develop methods, techniques and research tools appropriate for the research being conducted, draw conclusions based on the results of scientific research	SD_U01	classroom observation
U2	document and present the results of research, and prepare scientific publications - in accordance with the rules for creating this type of scientific work and respecting the principles of intellectual property rights	SD_U06	classroom observation, written credit
U3	define the purpose and subject of research, formulate a research hypothesis, develop methods, techniques and research tools and apply them creatively draw conclusions based on research results	SD_U11	classroom observation, written credit
Social competences – PhD student is ready to:			
K1	reliable and precise presentation and justification of reasoning, as well as to distinguish between reporting results and their interpretation	SD_K06	classroom observation
K2	a critical approach to reasoning, recognition of the importance of knowledge from other disciplines and fields of knowledge in solving cognitive and practical problems, and is ready to take into account solutions proposed by other disciplines and fields of knowledge in his research	SD_K08, SD_K09	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
classes	20
preparation for classes	20
preparation for test	18
participation in examination	2
PhD student workload	**Hours** 60
Workload involving teacher	**Hours** 20

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Analysis of variance – models with repeated measures. ROC curve analysis.	W1, U1, U3, K1	classes
2.	Calculation of sample size and test power. Survival analysis - Cox proportional hazards model or meta-analysis (depending on the preferences of the students and the instructor). Selected statistical methods for analyzing data with complex structure (e.g. disturbing variables, interactions, ANCOVA - depending on the preferences of the students and the instructor).	U2, U3, K2	classes
3.	Selected methods of data reduction (cluster analysis, factor analysis, reliability analysis - depending on the preferences of the students and the instructor).	W2, U3	classes

Course advanced

Teaching methods :

computer classes

Activities	Examination methods	Credit conditions
classes	classroom observation, written credit	Attendance at all lessons is required; doctoral students who are unable to attend are obliged to read the materials provided by the lecturer by themselves. Activity is additionally scored up to 10% of total points.

Additional info

Written assessment. The colloquium, in the form of tasks to be solved, is of a practical nature and verifies the understanding of statistical methods used to analyze biomedical problems; it may also contain theoretical questions, as well as questions constructed based on scientific articles in English, previously sent to students. Passing the final test takes place after obtaining at least 60% of the possible points. The final grade additionally takes into account points awarded for activity during classes (up to 10%). Final rating according to the scheme: below 60%: unsatisfactory, 60-69%: dst, 70-74%: plus dst, 75-84%: good, 85-90%: plus good, above 90%: very good

Entry requirements

Elements of probability theory, distribution of random variables, descriptive statistics of quantitative and qualitative variables, testing of simple relationships between two variables (without taking into account confounders/covariates).

Linking with research conducted at the university

Examples of implemented projects/publications:
1)   Micek A.*, Grosso G., Polak M., Kozakiewicz K., Tykarski A., Puch-Walczak A., Drygas W., Kwaśniewska M., Pająk A.: Association between tea and coffee consumption and prevalence of metabolic syndrome in Poland - results from the

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WOBASZ II study (2013-2014), Int J Food Sci Nutr. 2018; 69(3): 358-368. IF: 2,792, Kwartyl wg JCR: Q2, MNiSW = 20.

2)   Micek A., Godos J., Lafranconi A., Marranzano M., Pająk A.: Caffeinated and decaffeinated coffee consumption and melanoma risk: a dose-response metaanalysis of prospective cohort studies, Int J Food Sci Nutr. 2018; 69(4): 417-426. IF: 2,792, Kwartyl wg JCR: Q2, MNiSW = 20.

3)   Micek A.*, Gniadek A., Kawalec P., Brzostek T.: Coffee consumption and colorectal cancer risk: a dose-response meta-analysis on prospective cohort studies, Int J Food Sci Nutr. 2019; 70(8): 986-1006. IF: 3,483, Kwartyl wg JCR: Q2, MNiSW = 70.

4)   Micek A.*, Godos J., Cernigliaro A., Cincione R. I., Buscemi S., Libra M. Galvano F., Grosso G.: Polyphenolrich and alcoholic beverages and metabolic status in adults living in Sicily, Southern Italy, Foods. 2021; 10(2): id. art. 383. IF: 5,561, Kwartyl wg JCR: Q2, MNiSW = 100.

5)   Micek A.*, Godos J., Cernigliaro A., Cincione R. I., Buscemi S., Libra M. Galvano F., Grosso G. Total nut, tree nut, and peanut consumption and metabolic status in Southern Italian adults, Int J Environ Res Public Health. 2021; 18(4): id. art. 1847. IF: 4,614, Kwartyl wg JCR: Q1, MNiSW = 140.

6)   Micek A.*, Godos J., Del Rio D., Galvano F., Grosso G.: Dietary flavonoids and cardiovascular disease: a comprehensive dose-response meta-analysis, Mol Nutr Food Res. 2021; 65(6): id. art. e2001019. IF: 6,575, Kwartyl wg JCR: Q1, MNiSW = 100.

7)   Micek A., Godos J., Brzostek T., Gniadek A., Favari C., Mena P., Del Rio D., Galvano F., Grosso G.: Dietary phytoestrogens and biomarkers of their intake in relation to cancer survival and recurrence: a comprehensive systematic review with meta-analysis, Nutr Rev. 2021; 79(1): 42–65. IF: 6,846, Kwartyl wg JCR: Q1, MNiSW = 140.

8)   Micek A., Raźny U., Kawalec P.: Association between health risk factors and dietary flavonoid intake in cohort studies, International Journal of Food Sciences and Nutrition, 2021: In press, s. 1-16, IF: 4,444, MNiSW: 70.

9)   Micek A., Owczarek M., Jurek J., Guerrera I., Torrisi S. A., Grosso G., Alshatwi Ali A., Godos J. Anthocyanin-rich fruits and mental health outcomes in an Italian cohort, Journal of Berry Research, 2022 : Vol. 12, nr 4, s. 551-564, abstr., IF: 2.156, MNiSW: 70.

10) Micek A., Jurek J., Owczarek M., Guerrera I., Torrisi S., Castellano S., Grosso G., Alshatwi A., Godos J., Polyphenol-rich beverages and mental health outcomes, Antioxidants, 2023 : Vol. 12, nr 2, id. art. 272, il., bibliogr. 78 poz., abstr., IF: 7.675, MNiSW: 100.

11) Micek A., Alshatwi A., Paladino N., Guerrera I., Grosso G., Castellano S., Godos J. Association between alcoholic (poly)phenol-rich beverage consumption and cognitive status in older adults living in a Mediterranean area, Int J Food Sci Nutr. 2023; DOI: 10.1080/09637486.2023.2199182, IF: 4.444, MNiSW: 70.

12) Micek A, Currenti W., Mignogna C., Rossi A., Barbagallo I., Alshatwi A., Del Rio D., Mena P., Godos J. Are (poly)phenols contained in 100% fruit juices mediating their effects on cardiometabolic risk factors? A meta-regression analysis, Frontiers in Nutrition 2023 : Vol. 10, id. art. 1175022, IF = 5.000, MNiSW: 70.

13) Micek A., Bolesławska I., Jagielski P., Konopka K., Waśkiewicz A., Witkowska A.M., Przysławski J., Godos J. Association of dietary intake of polyphenols, lignans, and phytosterols with immune-stimulating microbiota and COVID-19 risk in a group of Polish men and women, Frontiers in Nutrition 2023 : Vol. 10, IF: 5.000, MNiSW: 70.

14) Godos J., Micek A., Marranzano M., Salomone F., Del Rio D., Ray S.: Coffee consumption and risk of biliary tract cancers and liver cancer: a dose response meta-analysis of prospective cohort studies, Nutrients, 2017; 9(9): art. no. 950, s. 1-17, IF: 4,196, MNiSW: 35.

15) Grosso G., Micek A., Godos J., Pajak A., Sciacca S., Bes-Rastrollo M., Galvano F., Martinez-Gonzalez Miguel A.: Long-term coffee consumption is associated with decreased incidence of new-onset hypertension: a dose response meta-analysis, Nutrients, 2017; 9(8): art. no. 890, s. 1-13, IF: 4,196, MNiSW: 35.

16) Konopka K., Micek A., Ochenduszko S., Streb J., Potocki P., Kwinta Ł., Wysocki P.. Combined neutrophil-to-lymphocyte and platelet-volume-to-platelet ratio (NLR and PVPR score) represents a novel prognostic factor in advanced gastric cancer patients. Journal of Clinical Medicine 2021 : Vol. 10, nr 17, il., bibliogr. 48 poz., abstr., IF: 4,964, MNiSW: 140.

17) Nenko I., Briga M., Micek A., Jasienska G., From January to June : Birth seasonality across two centuries in a rural Polish community, Scientific Reports, 2022; Vol. 12, id. art. 18579, il., bibliogr., abstr. IF: 4.997, MNiSW: 140.

Linear model in experimental setup
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 3	Examination graded credit Activities and hours classes: 20	Number of ECTS points 2.0

Goals

C1	The aim of the course is to prepare and introduce the student to the statistical analysis of experimental data accordingly to the current knowledge in the field.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The student is familiar to and understands the methodology of scientific research, including theoretical foundations and general issues related to planning research in the field of pharmaceutical or other medical sciences, data mining and statistical analysis of the obtained results.	SD_W01	assignment report

Code	Outcomes in terms of	Effects	Examination methods
W2	The student is familiar to and understands the methodology of scientific research covering selected detailed issues, appropriate for the use of mathematical statistics and data mining methods in pharmaceutical or other medical sciences, to the extent that allows for the revision of existing paradigms.	SD_W02	assignment report
W3	The student is familiar to and understands main development trends in statistical methodology important for education in the field of pharmaceutical or other medical sciences.	SD_W09	assignment report
Skills – PhD student can:			
U1	The doctoral student is able to use the acquired knowledge to critically analyze and evaluate the results of scientific research, the achievements of the represented scientific discipline and his/her own contribution to the development of this discipline, to formulate new solutions to problems within existing and modified methodological paradigms; - creatively apply and develop methods, techniques and research tools appropriate for the research being conducted, - carry out statistical inferences based on the results of scientific research.	SD_U01	assignment report, Watching of student's work.
U2	The doctoral student is able to document and present the results of research using the tools of descriptive statistics and prepare scientific publications - in accordance with the principles of creating this type of studies and respecting the principles of intellectual property protection.	SD_U06	assignment report, Watching of student's work.
Social competences – PhD student is ready to:			
K1	The PhD student is ready to recognize the importance of knowledge in the field of mathematical statistics, machine learning and data mining in solving cognitive and practical problems.	SD_K08	assignment report, Watching of student's work.
K2	The PhD student is ready to take into account solutions proposed by mathematical statistics and related disciplines in his research.	SD_K09	assignment report, Watching of student's work.

Calculation of ECTS points

Activity form	Activity hours*
classes	20
independent education	10
preparation of a report	16
consultations with lecturer	4
PhD student workload	**Hours** 50

Workload involving teacher	Hours 20

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	The general linear model as a universal tool for multivariate analysis of variance and linear regression analysis in various experimental designs and for various types of medical research.	W1, W2, W3, U1, U2, K1, K2	classes
2.	General factorial 2^k experimental design as a tool for initial data exploration in search of significant factors.	W1, W2, W3, U1, U2, K1, K2	classes
3.	Data mining techniques: logistic regression, multiple regression, classification trees, principal component analysis and cluster analysis, artificial neural networks, SVM, partial least squares method.	W1, W2, W3, U1, U2, K1, K2	classes
4.	Generalized linear model - areas of application.	W1, W2, W3, U1, U2, K1, K2	classes

Course advanced

Teaching methods :

classes / practicals, e-learning, computer room, assignments solving

Activities	Examination methods	Credit conditions
classes	assignment report, Watching of student's work.	Correctly solved all problems given on platform Pegaz.

Additional info

Assessment is carried out by checking the report on statistical analyzes by the instructor and possibly further discussion with the student via the distant learning platform (Pegaz).

Entry requirements

Passed basic course - Biostatistics I

Linking with research conducted at the university

[1]   Florek E, Piekoszewski W, Czarnywojtek A, Sędziak A, Jawień W, Dera-Szymanowska A, i in. Differences in the sex hormone levels in the menstrual cycle due to tobacco smoking - a myth or reality? Endokrynol Pol 2022;73:16–25. https://doi.org/10.5603/EP.a2021.0097.
[2]   Adamiak-Giera U, Jawień W, Pierzchlińska A, Białecka M, Kobierski JD, Janus T, i in. Pharmacokinetics of Levodopa and 3-O-Methyldopa in Parkinsonian Patients Treated with Levodopa and Ropinirole and in Patients with Motor Complications. Pharmaceutics 2021;13:1395. https://doi.org/10.3390/pharmaceutics13091395.
[3]   Kotańska M, Kubacka M, Bednarski M, Nicosia N, Szafarz M, Jawień W, i in. The GPR18 Agonist PSB-KD-107 Exerts Endothelium-Dependent Vasorelaxant Effects. Pharmaceuticals 2021;14:799. https://doi.org/10.3390/ph14080799.
[4]   Golasik M, Jawień W, Przybyłowicz A, Szyfter W, Herman M, Golusiński W, et al. Classification models based on the level of metals in hair and nails of laryngeal cancer patients: diagnosis support or rather speculation? Metallomics

2015;7:455–65.

[5]   Jawień W, Wilimowska J, Kłys M, Piekoszewski W, Jawień W. Population pharmacokinetic modelling of valproic acid and its selected metabolites in acute VPA poisoning. Pharmacol Rep 2017;69:340–9.

Statistical methods for practical management of omics data
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 3	Examination graded credit Activities and hours classes: 20	Number of ECTS points 2.0

Goals

C1	The aim of the course is to familiarize PhD students with OMICs data and computational methods for their analysis and integration.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The PhD student knows what tools he can use to analyze OMICS data.	SD_W01	essay, project
Skills – PhD student can:			

Code	Outcomes in terms of	Effects	Examination methods
U1	The PhD student is able to use methods and tools in the field of bioinformatics related to OMICS and apply them creatively to draw conclusions about the obtained research results.	SD_U11	essay, project
Social competences – PhD student is ready to:			
K1	While learning methods and analytical tools for OMICs data, the PhD student has the opportunity to review the resources offered by biostatistics and bioinformatics.	SD_K08	essay, project

Calculation of ECTS points

Activity form	Activity hours*
classes	20
preparation of a project	10
preparation for classes	4
preparation of a paper	10
consultations with lecturer	5
preparation of a report	5
PhD student workload	**Hours** 54
Workload involving teacher	**Hours** 20

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Introduction to biostatistical and bioinformatic methods in medicine and related sciences. Integration of data from various levels of the human body. Bioinformatics databases - e.g. Reactome, KEGG, NCBI, EMBL-EBI and the use of Cytoscape to analyze and visualize OMICs data.	W1, U1, K1	classes
2.	Analysis of genomic and epigenomic data, and their interpretation, e.g. using the LIMMA library (Bioconductor).	W1, U1, K1	classes
3.	Analysis of gene and genome sequence data and their interpretation using e.g. the coRdon library (Bioconductor).	W1, U1, K1	classes

No.	Course content	Subject's learning outcomes	Activities
4.	Association coefficient "Z" and analysis of protein activity paths based on, among others, the pathview library from Bioconductor.	W1, U1, K1	classes
5.	Student's project	W1, U1, K1	classes
6.	Student's project	W1, U1, K1	classes

Course advanced

Teaching methods :

computer classes, discussion, e-learning, seminar

Activities	Examination methods	Credit conditions
classes	essay, project	The doctoral student completes the task during each tutorial and sends his or her work for evaluation in the form of a report. As part of the student project, the doctoral student develops a computational example based on the selected method and analytical tool, and then demonstrates their functionalities. He presents his work to the entire group. The substantive value of the presentation is assessed.

Additional info

Due to the use of computers and open source software, classes may be held online.

Entry requirements

Finished course:
"Introduction to R programming"

Linking with research conducted at the university

The university conducts research involving the analysis and integration of OMICs data.
Below are examples of publications authored by the course instructor.

1: Wróbel S, Turek C, Stępień E, Piwowar M. Data integration through Canonical
Correlation Analysis and its application to OMICs research. J Biomed Inform.
2023 Dec 10:104575. doi: 10.1016/j.jbi.2023.104575. Epub ahead of print. PMID:
38086443.
2: Zapała B, Kamińska A, Piwowar M, Paziewska A, Gala-Błądzińska A, Stępień EŁ.
miRNA Signature of Urine Extracellular Vesicles Shows the Involvement of
Inflammatory and Apoptotic Processes in Diabetic Chronic Kidney Disease. Pharm
Res. 2023 Apr;40(4):817-832. doi: 10.1007/s11095-023-03481-5. Epub 2023 Mar 1.
PMID: 36859746; PMCID: PMC10126023.
3: Turek C, Wróbel S, Piwowar M. OmicsON - Integration of omics data with
molecular networks and statistical procedures. PLoS One. 2020 Jul
29;15(7):e0235398. doi: 10.1371/journal.pone.0235398. PMID: 32726348; PMCID:
PMC7390260.
4: Piwowar M, KuŁaga T. Directional Association Measurement in Contingency
Tables: Genomic Case. J Comput Biol. 2019 Mar;26(3):235-240. doi:
10.1089/cmb.2018.0202. Epub 2018 Dec 18. PMID: 30562062; PMCID: PMC6441286.

Biological and biosimilar medications. Generic medications

Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Pharmaceutical sciences	**Lecture languages** polish, english
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Pharmaceutical science	**Examination** graded credit
ISCED classification 0916 Pharmacy	

Period Semester 4	Examination graded credit **Activities and hours** seminar: 13 classes: 2	Number of ECTS points 1.0

Goals

C1	To familiarize PhD students with the concepts of bioequivalence, generic drugs and biosimilar of drugs.
C2	Comparison of requirements for generic and biosimilar drugs, paying attention to the legal status and regulatory environments in various regions of the world.
C3	To familiarize PhD students with statistical tools for assessing the similarity of low-molecule and biological drugs.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	theoretical foundations and general issues of drug science necessary to define generic and biosimilar drugs	SD_W01	test
W2	economic, legal and ethical conditions for introducing generic and biosimilar drugs to the market	SD_W03	test
Skills – PhD student can:			
U1	interpret basic research results for introducing generic and biosimilar drugs to the market	SD_U01	classroom observation
Social competences – PhD student is ready to:			
K1	critical assessment of scientific achievements and expert activity within the scientific discipline in which the doctoral dissertation is prepared	SD_K01	test
K2	recognizing the importance of knowledge from other disciplines and fields of knowledge (other than the one in which the doctoral project is being carried out) in solving cognitive and practical problems	SD_K08	test

Calculation of ECTS points

Activity form	Activity hours*
seminar	13
classes	2
preparation for classes	2
preparation for examination	8
independent education	5
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Definition and legal and administrative basis for introducing generic drugs to the market.	W1, W2	seminar
2.	The concept of bioequivalence in statistical terms.	U1, K2	classes
3.	Biological and biosimilar drugs	W2, K1	seminar

No.	Course content	Subject's learning outcomes	Activities
4.	Differences in requirements for introducing a generic and biosimilar drug to the market.	W1, W2, K1, K2	seminar

Course advanced

Teaching methods :

computer classes, seminar

Activities	Examination methods	Credit conditions
seminar	test	Grades (minimal points): 5.0 (95%), 4.5 (85%), 4.0 (75%), 3.5 (65%), 3.0 (50%)
classes	classroom observation, test	Grades (minimal points): 5.0 (95%), 4.5 (85%), 4.0 (75%), 3.5 (65%), 3.0 (50%)

Entry requirements

Linking with research conducted at the university

1. Żesławska E, Kucwaj-Brysz K, Kincses A, Spengler G, Szymańska E, Czopek A, Marć MA, Kaczor A, Nitek W, Domínguez-Álvarez E, Latacz G, Kieć-Kononowicz K, Handzlik J. An insight into the structure of 5-spiro aromatic derivatives of imidazolidine-2,4-dione, a new group of very potent inhibitors of tumor multidrug resistance in T-lymphoma cells. Bioorg Chem. 2021 Apr;109:104735. doi: 10.1016/j.bioorg.2021.104735. Epub 2021 Feb 18. PMID: 33640632.
2. Tuszyński, P. K.; Szlęk, J.; Polak, S.; Jachowicz, R. & Mendyk, A. In Vitro-In Vivo Correlation (IVIVC): From Current Achievements Towards the Future. Dissolution Technologies, 2018, Vol. 25, s. 20-27

Modern methods of optimizing drug dosing in subpopulations
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Pharmaceutical sciences	**Lecture languages** polish
Mandatory elective	**Block** obligatory for passing a year
Disciplines Pharmaceutical science	**Examination** graded credit
ISCED classification 0916 Pharmacy	

Period Semester 4	Examination graded credit Activities and hours classes: 8 e-learning seminar: 7	Number of ECTS points 1.0

Goals

C1	Overview of differences in drug pharmacokinetics in subpopulations, such as: paediatric or geriatric patients, patients with liver and kidney diseases, on renal replacement therapy, with obesity, or pregnant and lactating women.
C2	Presentation of contemporary methods of drug dosage modification in subpopulations, taking into account differences in drug pharmacokinetics in various patient populations.
C3	Familiarizing doctoral students with programs for population modeling and physiologically based pharmacokinetic modeling as modern methods of dose selection as well as dedicated programs such as e.g. PrecisePK.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	PhD student knows and understands a scientific research methodology covering theoretical foundations and general issues related to the represented discipline of medical and health sciences taught at the doctoral school.	SD_W01	credit
W2	PhD student knows and understands scientific research methodology covering selected detailed issues relevant to the discipline in which the doctoral dissertation is prepared to the degree that allows for a revision of the existing paradigms.	SD_W02	assignment report, credit
W3	PhD student knows and understands global achievements, including theoretical foundations, general issues and selected specific issues related to the discipline in which the doctoral dissertation is prepared.	SD_W08	credit
W4	PhD student knows and understands the main development trends of scientific disciplines crucial for education in medical and health sciences.	SD_W09	credit
Skills – PhD student can:			
U1	PhD student using his/her knowledge can critically analyze and evaluate the results of scientific research achievements in the discipline represented and his/her contribution to its development; can formulate new solutions to problems within established and modified methodological paradigms; can creatively apply and develop methods, techniques and research tools appropriate for the conducted research; is able to make conclusions based on scientific research results.	SD_U01	oral answer
U2	PhD student using his/her knowledge can critically analyze and evaluate research results, expert activities and other creative works and their contribution to the knowledge development.	SD_U12	oral answer
U3	PhD student can use knowledge from a given scientific discipline to creatively identify, formulate and innovatively solve complex problems or perform research tasks..	SD_U13	oral answer, assignment report
U4	PhD student can critically refer to the current state of research in the discipline in which his/her doctoral project is implemented.	SD_U14	oral answer, assignment report
Social competences – PhD student is ready to:			
K1	PhD student is ready for a critical evaluation of his/her scientific achievements and expert activities within the discipline in which the doctoral dissertation is prepared.	SD_K01	classroom observation
K2	PhD student can identify the need to formulate new research paradigms within the discipline in which is his/her doctoral project is implemented.	SD_K04	oral answer

Code	Outcomes in terms of	Effects	Examination methods
K3	PhD student is ready to think and act in an enterprising way, creating new ideas and seeking innovative solutions with representatives of other disciplines; is prepared for intellectual challenges in scientific/professional and public sphere and taking responsibility for his/her decisions..	SD_K06	classroom observation
K4	PhD student can recognize the importance of knowledge from other disciplines and domains (other than that the one in which the doctoral programme is implemented) in addressing cognitive and practical problems.	SD_K08	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
classes	8
e-learning seminar	7
case analysis	3
independent education	5
analysis of the research material	2
preparation for colloquium	5
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Differences in the processes of absorption, distribution and elimination in subpopulations. Effect of these differences on concentration-time profile and pharmacological effect.	W1, W4, U3, K4	e-learning seminar
2.	Factors influencing the variability of pharmacokinetics of drugs in the geriatric population. Differences in the dosage of drugs in the elderly compared to young patients.	W2, W4, U1, U3, K2	e-learning seminar
3.	Reasons for variability in drug pharmacokinetics in the paediatric population. Differences in the dosage of selected drugs (daily dose, dose interval) in children compared to adults.	W2, W4, U1, U3, K2	e-learning seminar

No.	Course content	Subject's learning outcomes	Activities
4.	Pharmacokinetics of selected drugs in pregnant and lactating women. Drug dosage in these populations based on pharmacokinetic criteria.	W2, W4, U1, U3, K2	e-learning seminar
5.	Dose modification in patients with hepatic and renal impairment. Optimization of PK/PD parameters and principles of monitoring concentrations in dialysis patients, on the example of aminoglycoside antibiotics and vancomycin.	W2, W4, U1, U3, K2	e-learning seminar
6.	Dosage of drugs in obese patients. Ideal, corrected, and real body weight. Physicochemical and pharmacokinetic properties of drugs requiring dose modification in obese patients.	W2, W4, U1, U3, K2	e-learning seminar
7.	Theoretical foundations of population analysis: Introduction to population pharmacokinetic modeling using Monolix. PBPK modeling in practice: using GastroPlus PBPK software to simulate changes in pharmacokinetics due to physiological differences in subpopulactions.	W1, W3, W4, U3, U4, K1, K3	e-learning seminar
8.	Optimization of drug dosage in various patient populations using modern computational methods and computer programs (e.g. WinNonlin, PrecisePK, ClinCalc).	W2, U2, U4, K1, K3	classes
9.	Population analysis using Monolix: Creation of population models based on clinical trial data and simulations to select individual dosing regimens.	U2, U4, K2, K4	classes
10.	PBPK modeling using the GastroPlus PBPK program. Performing simulations to assess the impact of physiological variables (e.g. age, body weight, comorbidities) on drug pharmacokinetics and their use in therapy planning.	U2, U4, K2, K4	classes

Course advanced

Teaching methods :

case study, brainstorm, computer classes, demonstration, discussion, e-learning, assignments solving, seminar

Activities	Examination methods	Credit conditions
classes	classroom observation, oral answer, assignment report	Positive assessment of activity during classes by the teacher (in the form of pluses on the attendance list) and correctness of solving clinical problems using calculations and computer simulations.
e-learning seminar	credit	Positive grade in the final test. The test consists of 20 questions, each rated on a 0-1 point scale, for which one can score a maximum of 20 points. To get pass, at least 12 points must be obtained .

Entry requirements

Knowledge of biology, biochemistry and human physiology.

Linking with research conducted at the university

The subject of the faculty is related to research on the clinical pharmacokinetics of selected drugs in subpopulations in order to select the optimal dose of the drug to ensure the effectiveness of treatment with a minimum risk of adverse effects. As a result of these studies, the following papers and conference reports were created:

1. Cios A., Wyska E., Szymura-Oleksiak J., Grodzicki T.: Population pharmacokinetic analysis of ciprofloxacin in the elderly patients with lower respiratory tract infections. Exp. Gerontol. 2014, 57: 107–113.
2. Cwiklinska M., Czogala M., Kwiecinska K., Madetko-Talowska A., Szafarz M., Pawinska K.   Wieczorek A., Klekawka T., Rej M., Stepien K., Halubiec P., Lazarczyk A., Miklusiak K., Bik-Multanowski M., Balwierz W., Skoczen S.: Polymorphisms of SLC19A1 80 G>A, MTHFR 677 C>T, and tandem TS repeats influence pharmacokinetics, acute liver toxicity, and vomiting in children with acute lymphoblastic leukemia treated with high doses of methotrexate. Front Pediatr. 2020, 8: 307.
3. Szafarz M., Klimza K., Czogała W., Balwierz W., Skoczeń S.: Optymalizacja dawkowania amikacyny u onkologicznych pacjentów pediatrycznych. Konferencja XI Zjazd Polskiego Towarzystwa Onkologii i Hematologii Dziecięcej. 2-4.06.2022, Bydgoszcz
4. Klimza K., Szafarz M., Cichocka-Jarosz E., Głodzik I., Piwowarczyk B., Wyska E.: Optymalizacja dawkowania wankomycyny u pacjentów pediatrycznych z powikłanym lub lekoopornym zapaleniem płuc. I Sympozjum Polskiego Towarzystwa Farmacji Klinicznej, 28-29.09.2023, Warszawa
5. Boś K., Szafarz M., Szymbor K., Czogała W., Świerczek-Skierawska I., Skoczeń S., Balwierz W., Wyska E.: LC-MS/MS analytical methods for quantification of three anticancer drug in VAMS-application to TDM in pediatric population. ESCP 52nd Symposium Implementing and scaling sustainable Clinical Pharmacy, 21-23.11.2024, Kraków.

Organization and financing of health care in Poland
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Doctoral programme
Health sciences

Mandatory
elective

Disciplines
Health science

ISCED classification
0917 Traditional and complementary medicine and therapy

Didactic cycle
2025/26

Realization year
2026/27

Lecture languages
polish

Block
obligatory for passing in the course of studies

Examination
credit

Period	Examination	Number of ECTS points
Semester 4	credit **Activities and hours** seminar: 6 e-learning seminar: 9	1.0

Goals

C1	Familiarizing doctoral students with the national rules for financing health care (streams and methods of allocating funds for particular types of services and individual healthcare providers) and their impact on the effectiveness of the Polish healthcare system.
C2	Developing the ability to critically evaluate media and political reports relating to the issues discussed.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	the most important tools and principles of financing health care in Poland and their impact on the functioning of the system	SD_W02, SD_W08	classroom observation, test
W2	new organizational solutions used in the health care system, in particular in the field of coordinated care	SD_W02, SD_W08	classroom observation, test
Skills – PhD student can:			
U1	participate in scientific discourse on the economic aspects of the functioning of the health care sector	SD_U07	classroom observation
U2	critically comment on the current state of research and formulations appearing in the public debate on the issue of financing and organization of health care	SD_U14	classroom observation
Social competences – PhD student is ready to:			
K1	taking into account the achievements of various disciplines and fields of knowledge, in particular economic and management sciences, in solving the cognitive and practical problems presented to him	SD_K08, SD_K09	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
seminar	6
e-learning seminar	9
preparation for classes	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	The level and the structure of healthcare expenditures in Poland and comparison to other countries; correct interpretation of indicators when making international comparisons.	W1, U1, K1	e-learning seminar
2.	Health care financing streams in Poland; advantages and disadvantages of public financing and private funds.	W2, U1, U2, K1	e-learning seminar
3.	Institutional organization of the healthcare system in Poland – between separation and integration.	W1, W2, U1, U2, K1	e-learning seminar

No.	Course content	Subject's learning outcomes	Activities
4.	Property rights – public or private ownership of hospitals?	W1, W2, U1, U2, K1	e-learning seminar
5.	Financing methods used by the public payer in Poland (NHF) - impact on the economic goals and behavior of healthcare providers.	W1, W2, U1, U2, K1	seminar
6.	Integrated and coordinated care in Poland – the importance of the applicable financing rules and organization of coordinated care.	W1, W2, U1, U2, K1	seminar

Course advanced

Teaching methods :

textual analysis, brainstorm, discussion, problem solving method, group work, seminar, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
seminar	classroom observation, test	The condition for passing the module is active participation in classes. Doctoral students who miss more than one two-hour block of classes are required to pass the test by correctly answering at least 60% of the questions asked in it.
e-learning seminar	classroom observation, test	The condition for passing the module is active participation in classes. Doctoral students who miss more than one two-hour block of classes are required to pass the test by correctly answering at least 60% of the questions asked in it.

Additional info

During online classes, doctoral students are obliged to use the camera at all times. Lack of visual connection will be considered as lack of attendance.

Entry requirements

no prerequisites

Linking with research conducted at the university

European Commission: Assessment of patient co-payment policies. Designing effects on health care efficiency, equity, and quality. Example of Central and Eastern European countries (ASSPRO Projet) (research coordinator) -7th Framework Program, Theme 8 Socio-economic Sciences and Humanities Project ASSPRO CEE 2007 (Grant Agreement no. 217431) www.assprocee2007.com (2007-2013)
Ministry of Health: Improving the quality of management in health care by supporting the process of creating regional maps of health needs as a tool to improve management processes in the health care system - training in the assessment of health needs (2014-2015), project co-financed by the European Social Fund
Prohealth 65+ Health Promotion and Prevention of Risk – Action for Seniors, project received funding from the European Union in the framework of the Health Program (2014-2016), http://www.pro-health65plus.eu/
PREDEFINED PROJECT: LIMITING SOCIAL INEQUALITIES IN HEALTH, Science and Health Consortium, Norway Grants 2014-2017
Transitional Care Innovation in Senior Citizens (TRANS-SENIOR), HORIZON 2020, Marie Sklodowska Curie Innovative Training Networks (European Commission) 2018-2022 (MSCA-ITN-2018-EJD-812656)
Sowada C., Sagan A., Kowalska-Bobko I. (eds.) (2019), Poland Health System Review, Health Systems in Transition, Vol. 21, No. 1, European Observatory on Health Systems and Policies, Copenhagen

Non-invasive biomarkers in human health studies
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Health sciences	**Lecture languages** polish, english
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Health science	**Examination** graded credit
ISCED classification 0917 Traditional and complementary medicine and therapy	

Period Semester 4	Examination graded credit Activities and hours seminar: 15	Number of ECTS points 1.0

Goals

C1	Familiarizing doctoral students with non-invasive research methods in the field of human biology - their types, methods of measurement, forms of practical application
C2	Understanding of possible ways of utilizing non-invasive methods in scientific research, along with possible advantages and disadvantages

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	basic knowledge about non-invasive research methods in human biology - their types and measurement methodology	SD_W01, SD_W07, SD_W08	essay, project

Code	Outcomes in terms of	Effects	Examination methods
W2	potential possibilities of utilization non-invasive research methods in scientific research	SD_W01, SD_W07, SD_W08	essay, project
W3	possible advantages and disadvantages of individual non-invasive research methods, along with their possible further directions of development	SD_W01, SD_W07, SD_W08	essay
Skills – PhD student can:			
U1	use theoretical knowledge to formulate own conclusions	SD_U01, SD_U07, SD_U11, SD_U12, SD_U13, SD_U14	essay, project
U2	express knowledge in writing and verbally at an academic level	SD_U01, SD_U04, SD_U07, SD_U11, SD_U12, SD_U13, SD_U14	essay, project
U3	find the necessary information in the professional literature and other reliable sources	SD_U04, SD_U12, SD_U13, SD_U14	essay, project
Social competences – PhD student is ready to:			
K1	treating people with different views with respect	SD_K05, SD_K07, SD_K08	essay, project
K2	bear responsibility for failure to comply with the rules during classes and the rules for passing the course	SD_K10	essay, project

Calculation of ECTS points

Activity form	Activity hours*
seminar	15
independent education	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Introduction to the non-invasive measurements in the field of human biology	W1, U3, K2	seminar
2.	Parameters related to body size (anthropometric measurements, e.g. body height, leg length, body composition)	W1, W2, U1, U3	seminar
3.	Assessment of the level of psychological stress based on measurements including e.g. saliva samples, hair and nail samples	W1, W2, U1, U3	seminar

No.	Course content	Subject's learning outcomes	Activities
4.	Assessment of fetal developmental environment based on e.g. birth parameters, finger lengths, fingerprints, and facial features	W1, W2, U1, U3	seminar
5.	Assessment of potential fertility, e.g. in saliva samples, dry blood drops, urine samples	W1, W2, U1, U3	seminar
6.	Assessment of biological aging of the organism, e.g. based on cheek swabs samples	W1, W2, U1, U3	seminar
7.	Critical assessment of the non-invasive measurements in terms of their advantages, disadvantages, and further directions of development	W2, W3, U2, K1	seminar

Course advanced

Teaching methods :

textual analysis, discussion, educational film, project method, presentation, group work, practical classes

Activities	Examination methods	Credit conditions
seminar	essay, project	1 individual project (60% of the final grade), 1 written essay (30%), activity during classes (10%)

Additional info

grade 3 - the student provides answers or presents the required problem at a basic level
grade 4 - the student gives correct answers or presents the discussed problems well, but does not cover all aspects of the issue
grade 5 - the student provide answers or presentations at a level demonstrating an in-depth understanding of the issues discussed

Entry requirements

Basic knowledge of human biology
English at a level that allows fluent work with foreign scientific articles

Linking with research conducted at the university

2022-2024: Urgency Grant from the National Agency for Academic Exchange NAWA, "Trauma, resilience, health: Hormonal, immunological and genetic biomarkers of stress response among three generations of Ukrainian refugees"
2018 - 2020: OPUS grant from the National Science Centre "Developmental programming and physical activity at adulthood in relation to levels of sex steroid hormones in women: implications for breast cancer prevention"
2014 – 2015: PRELUDIUM grant from the National Science Centre "Biomarkers of fetal programming and female health and fertility"

Medical techniques in biomedicine
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Medical sciences	**Lecture languages** polish, english
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Medical science	**Examination** graded credit
ISCED classification 0912 Medicine	

Period Semester 4	**Examination** graded credit **Activities and hours** e-learning seminar: 15	**Number of ECTS points** 1.0

Goals

C1	Presentation of the most important and most widely used research techniques in biomedicine.
C2	Using the methodological knowledge to critically evaluate the results of scientific research published in the field of biomedicine discipline.
C3	Using methodological knowledge to expand the scope and improve the quality of the own research with other complementary research techniques.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	methodology of the most important research techniques used in biomedical research	SD_W01	test
Skills – PhD student can:			
U1	verify research hypotheses or expand the scope of research by formulating new research problems based on the implementation of known molecular techniques, and critically analyze and evaluate the results of scientific research	SD_U01	test
Social competences – PhD student is ready to:			
K1	critical assessment of scientific achievements and expert activity within the scientific discipline in which the doctoral dissertation is prepared	SD_K01	test

Calculation of ECTS points

Activity form	Activity hours*
e-learning seminar	15
preparation for test	15
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	1. "Basics of genomics" (Dr. Gracjan Wątor; OMICRON Center for Medical Genomics). 2. "Basics of molecular biology techniques" (Prof. Marek Sanak, 2nd Department of Internal Medicine). 3. "Basics of genetic engineering techniques" (Prof. Marcin Magierowski, Department of Physiology). 4. "Methods of proteomic research." (Prof. Maciej Suski, Department of Pharmacology). 5. "Selected analytical techniques in diagnostic tests" (Prof. Bogdan Solnica, Department of Clinical Biochemistry). 6. "Flow cytometry" (Prof. Jarosław Baran, Department of Immunology and Transplantology). 7. "Imaging techniques in biological research - microscopy" (Prof. Krzysztof Okoń, Department of Pathomorphology).	W1, U1, K1	e-learning seminar

Course advanced

Teaching methods :

discussion, seminar

Activities	Examination methods	Credit conditions
e-learning seminar	test	1. Attendance at seminars 2. A positive test result (at least 60% of correct answers)

Additional info

Attendance at seminars - admission to the final test exam may be obtained if excused absence from one seminar during the course took place. If a larger number of absences occurred, a Ph.D. student at the Doctoral School of Medical and Health Sciences may obtain permission to pass the exam after documenting the reason for the absences and obtaining individual consent to admission to the final exam by the director of the Doctoral School of Medical and Health Sciences.

Entry requirements

No preliminary knowledge needed.

Linking with research conducted at the university

The aim of the course is to present the most important and widely used research techniques in biomedicine conducted by research centers, including the Jagiellonian University Medical College. Course teachers are specialists in their research fields and methodological areas in which they conduct their own research.

Wiśniewska A, Czepiel K, Stachowicz A, Pomierny B, Kuś K, Kiepura A, Stachyra K, Surmiak M, Madej J, Olszanecki R, Suski M. The antiatherosclerotic action of 1G244 - An inhibitor of dipeptidyl peptidases 8/9 - is mediated by the induction of macrophage death. Eur J Pharmacol. 2023 Apr 5;944:175566. doi: 10.1016/j.ejphar.2023.175566. Epub 2023 Feb 3. PMID: 36739078.
Magierowska K, Wójcik-Grzybek D, Korbut E, Bakalarz D, Ginter G, Danielak A, Kwiecień S, Chmura A, Torregrossa R,

Whiteman M, Magierowski M. The mitochondria-targeted sulfide delivery molecule attenuates drugs-induced gastropathy. Involvement of heme oxygenase pathway. Redox Biol. 2023 Oct;66:102847. doi: 10.1016/j.redox.2023.102847. Epub 2023 Aug 12. PMID: 37597422

Solnica B, Sniderman AD, Wyszomirski A, Rutkowski M, Chlebus K, Bandosz P, Pencina MJ, Zdrojewski T. Concordance/discordance between serum apolipoprotein B, low density lipoprotein cholesterol and non-high density lipoprotein cholesterol in NATPOL 2011 participants - An epidemiological perspective. Int J Cardiol. 2023 Nov 1;390:131150. doi: 10.1016/j.ijcard.2023.131150. Epub 2023 Jul 8. PMID: 37429441.

Mastalerz L, Kacorzyk R, Jakieła B, Ćmiel A, Sanak M. Sputum transcriptome analysis of co-regulated genes related to arachidonic acid metabolism in N-ERD. Allergy. 2023 Feb;78(2):553-555. doi: 10.1111/all.15501. Epub 2022 Sep 6. PMID: 36048968.

Stec M, Czepiel M, Lenart M, Piestrzyńska-Kajtoch A, Plewka J, Bieniek A, Węglarczyk K, Szatanek R, Rutkowska-Zapała M, Guła Z, Kluczewska A, Baran J, Korkosz M, Siedlar M. Monocyte subpopulations display disease-specific miRNA signatures depending on the subform of Spondyloarthropathy. Front Immunol. 2023 Apr 17;14:1124894. doi: 10.3389/fimmu.2023.1124894. PMID: 37138886.

Kujdowicz M, Perez-Guaita D, Chlosta P, Okon K, Malek K. Fourier transform IR imaging of primary tumors predicts lymph node metastasis of bladder carcinoma. Biochim Biophys Acta Mol Basis Dis. 2023 Dec;1869(8):166840. doi: 10.1016/j.bbadis.2023.166840. Epub 2023 Aug 7. PMID: 37558006.

Wątor G, Seweryn M, Kapusta P, Świrta J, Wałęga P, Barczyński M, Wołkow PP. Intratumor heterogeneity in colorectal cancer: Distribution of tumor suppressor gene variants with regard to patient lymph node status. Clin Genet. 2023 Oct;104(4):406-417. doi: 10.1111/cge.14388. Epub 2023 Jun 20. PMID: 37339860.

Imaging methods in medical sciences
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Doctoral programme Medical sciences	**Lecture languages** polish
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Medical science	**Examination** graded credit
ISCED classification 0914 Medical diagnostic and treatment technology	

Period Semester 4	Examination graded credit **Activities and hours** seminar: 12 workshop: 3	Number of ECTS points 1.0

Goals

C1	Improve your understanding of contemporary diagnostic imaging methods.
C2	Learning about the spectrum of technical capabilities of the various diagnostic tools.
C3	To learn how to standardise scientific research using imaging methods, so that your results can be compared to those of other leading centres or included in multi-centre analyses.
C4	Increase understanding of how modern telecommunications methods in diagnostic imaging can be used in research.
C5	Exploring the use of new artificial intelligence methods to support the work of the radiologist for scientific purposes.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	methodology of modern diagnostic imaging methods including the spectrum of technical capabilities of individual diagnostic tools	SD_W01	gap filling test
W2	methods for standardising the conduct of scientific research using imaging modalities that enable comparison of own results with those of other leading centres or the inclusion of own results in multi-centre analyses	SD_W02	gap filling test
W3	main trends of modern telecommunication methods and artificial intelligence in diagnostic imaging	SD_W03	gap filling test
Skills – PhD student can:			
U1	using their knowledge to critically analyse and evaluate the scientific results of various medical imaging diagnostic methods and to compare their own results to data from the literature	SD_U01	gap filling test
U2	using their knowledge to critically analyse and evaluate the scientific results of various medical imaging diagnostic methods and to compare their own results to data from the literature	SD_U02	gap filling test
Social competences – PhD student is ready to:			
K1	critically appraise his/her scientific output and expert activity within the scientific discipline in which the doctoral thesis is being prepared	SD_K01	gap filling test
K2	identifying the need for the formulation of new research paradigms within the field of knowledge to which the discipline within which he/she is carrying out the doctoral project belongs	SD_K02	gap filling test
K3	take account in their research of solutions proposed by other disciplines and fields of knowledge	SD_K03	gap filling test

Calculation of ECTS points

Activity form	Activity hours*
seminar	12
workshop	3
preparation for classes	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Imaging - new techniques, protocols, opportunities.	W1, W2, W3, K1, K2, K3	seminar
2.	Technical fundamentals, protocols, structural descriptions, advantages and limitations of the various techniques in terms of their use for scientific research: Computed tomography.	W2, U1, U2, K1, K2, K3	seminar
3.	Technical fundamentals, protocols, structural descriptions, advantages and limitations of the various techniques in terms of their use for scientific research: Magnetic Resonance.	W1, W2, W3, U1, U2, K1, K2, K3	seminar
4.	Technical fundamentals, protocols, structural descriptions, advantages and limitations of the different techniques in terms of their use for scientific research: MRI: diffusion imaging and spectroscopy.	W2, U1, U2, K1, K2, K3	workshop
5.	Technical fundamentals, protocols, structural descriptions, advantages and limitations of the different techniques in terms of their use for scientific research: SPECT and PET.	W1, W2, W3, U1, U2, K1, K2, K3	seminar
6.	Technical fundamentals, protocols, structural descriptions, advantages and limitations of the different techniques in terms of their use for scientific research: Ultrasonography with echocardiography and angiography.	W1, W2, W3, U1, U2, K1, K2, K3	seminar
7.	Artificial intelligence methods to support the work of the radiologist.	W1, W2, W3, U1, U2, K1, K2, K3	seminar

Course advanced

Teaching methods :

case study, seminar, workshop

Activities	Examination methods	Credit conditions
seminar	gap filling test	Attendance in classes and answering test questions.
workshop	gap filling test	Attendance in classes and answering test questions.

Additional info

To pass the course, you must attend class and score at least 60% on the course test.

Entry requirements

Knowledge of diagnostic imaging basics in medicine.

Linking with research conducted at the university

1. Wiktoria Wojciechowska, Michał Terlecki, Marek Rajzer, Danuta Czarnecka. Anomalous origin of the circumflex artery from the right Valsalva sinus on transthoracic echocardiography DOI: 10.5603/KP.2019.0053·Kardiol Pol 2019;77(3):394.
2. Wiktoria Wojciechowska, Andrzej Januszewicz, Tomasz Drożdż, Marta Rojek, Justyna Bączalska, Michał Terlecki, Karol

Kurasz, Agnieszka Olszanecka, Mikołaj Smólski, Aleksander Prejbisz, Piotr Dobrowolski, Tomasz Grodzicki, Tomasz Hryniewiecki, Reinhold Kreutz, and Marek Rajzer. Blood Pressure and Arterial Stiffness in Association With Aircraft Noise Exposure: Long-Term Observation and Potential Effect of COVID-19 Lockdown. Hypertension. 2021;0:HYPERTENSIONAHA.121.17704

3. Urbanik A, Guz W, Gołębiowski M, Szurowska E, Majos A, Sąsiadek M, Stajgis M, Ostrogórska M. Assessment of the corpus callosum size in male individuals with high intelligence quotient (members of Mensa International). Radiologie (Heidelb). 2023 Nov;63(Suppl 2):49-54. doi: 10.1007/s00117-023-01146-3. Epub 2023 May 9. PMID: 37160478; PMCID: PMC10689507.

4. Chrzan R, Wizner B, Sydor W, Wojciechowska W, Popiela T, Bociąga-Jasik M, Olszanecka A, Strach M. Artificial intelligence guided HRCT assessment predicts the severity of COVID-19 pneumonia based on clinical parameters. BMC Infect Dis. 2023 May 10;23(1):314. doi: 10.1186/s12879-023-08303-y. PMID: 37165346; PMCID: PMC10170419.

5. Rozynek M, Gut D, Kucybała I, Strzałkowska-Kominiak E, Tabor Z, Urbanik A, Kłęk S, Wojciechowski W. Fully automated 3D body composition analysis and its association with overall survival in head and neck squamous cell carcinoma patients. Front Oncol. 2023 Oct 19;13:1176425. doi: 10.3389/fonc.2023.1176425. PMID: 37927466; PMCID: PMC10621032.

6. Bryll A, Krzyściak W, Karcz P, Pilecki M, Śmierciak N, Szwajca M, Skalniak A, Popiela TJ. Determinants of Schizophrenia Endophenotypes Based on Neuroimaging and Biochemical Parameters. Biomedicines. 2021 Apr 1;9(4):372. doi: 10.3390/biomedicines9040372. PMID: 33916324; PMCID: PMC8066217.

7. Śmierciak N, Krzyściak W, Szwajca M, Karcz P, Bryll A, Popiela TJ, Donicz P, Turek A, Aleksandrovych V, Pilecki M. Benefits and Meaning of Lipids Profile in Relation to Oxidative Balance and Brain Morphology in Schizophrenia. Int J Mol Sci. 2023 Jul 12;24(14):11375. doi: 10.3390/ijms241411375. PMID: 37511134; PMCID: PMC10379229.

8. Sorysz D, Dziewierz A, Opalinska M, Sowa-Staszczak A, Grochowska A, Malinowski KP, Maruszak N, Bartuś S, Dudek D. 18F-fluorodeoxyglucose and 18F-sodium fluoride positron emission tomography imaging in assessing early stages of aortic valve degeneration after transcatheter aortic valve implantation. Pol Arch Intern Med. 2023 Dec 21;133(12):16607. doi: 10.20452/pamw.16607. Epub 2023 Nov 15. PMID: 37966038.

Protection of intellectual property. Patent and implementation rules
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2026/27
Mandatory obligatory	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing a year
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 4	Examination graded credit **Activities and hours** e-learning seminar: 8 e-learning lecture: 2	Number of ECTS points 1.0

Goals

C1	Preparing the participants of the education program to implement the results of scientific research into the sphere of practical use.
C2	Ability to apply legal protection of inventions and assess patentability.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	linking the potential of basic research results with their practical and economic use	SD_W04, SD_W06	project

Code	Outcomes in terms of	Effects	Examination methods
W2	rules for establishing economic entities (e.g. spin-offs, spin-outs) for the purpose of commercialization and implementation of research results	SD_W03, SD_W06	project
Skills – PhD student can:			
U1	prepare presentations of research results in the context of their commercial application, so as to interest potential investors	SD_U01, SD_U06	project
U2	cooperate with a patent attorney to prepare a patent application	SD_U10, SD_U11	project
U3	independently assess the commercialization potential of your own research results	SD_U01	project
Social competences – PhD student is ready to:			
K1	conducting scientific research, taking into account current social and economic needs, taking into account not only economic profit, but also the ethical aspect of research	SD_K06, SD_K07	project

Calculation of ECTS points

Activity form	Activity hours*
e-learning seminar	8
e-learning lecture	2
preparation of a project	20
PhD student workload	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Intellectual property in scientific research from the scientist's point of view.	U1, U3, K1	e-learning seminar
2.	Intellectual property - basic issues and concepts regarding intellectual property and patent procedure.	W1	e-learning lecture, e-learning seminar
3.	Patent information in practice - how to prepare for filing an invention, examination of patentability, use of patent databases to analyze your own research topics.	W1, W2	e-learning seminar
4.	Relations between the world of science and the economy - types and methods of commercialization of scientific research results, strategies for implementing university inventions, confidentiality agreements, sale of rights, licenses, commissioned research, companies.	U2, K1	e-learning seminar

No.	Course content	Subject's learning outcomes	Activities
5.	Regulations and practice in technology transfer at the Jagiellonian University: intellectual property protection, technological offer, models of cooperation with industry, environment for the development of life science technologies in Poland and Krakow (organizations, funds, partners).	W1, W2, U1, U2	e-learning seminar

Course advanced

Teaching methods :

computer classes, e-learning, project method, seminar, lecture

Activities	Examination methods	Credit conditions
e-learning seminar	project	Analysis of the commercial potential of selected aspects of research topics carried out by students as part of their doctoral thesis - in the form of a PowerPoint presentation.
e-learning lecture	project	Analysis of the commercial potential of selected aspects of research topics carried out by students as part of their doctoral thesis - in the form of a PowerPoint presentation.

Additional info

PROJECT EVALUATION CRITERIA:
(5.0) - The presented presentation contains all the information about the commercial potential of the proposed project, and the author shows creativity and proposes solutions that go beyond the knowledge conveyed during the classes. The presentation is concise and logically structured.
(4.0) - The presentation contains all the information about the commercial potential of the proposed project. The presentation is concise and logically structured.

(3.0) - The presentation contains all the information about the commercial potential of the proposed project. The presentation is too extensive and contains irrelevant threads or contains incorrect assumptions about the commercialization potential.
(2.0) - Incomplete presentation, composed in a manner contrary to the knowledge conveyed during the classes. It contains substantive errors. Also includes a lack of presentation.

Entry requirements

Knowledge of English and basic issues related to obtaining finance for scientific research. Knowledge of the rules for disseminating scientific research results.

Linking with research conducted at the university

The content of the course "Protection of intellectual property. Patent and implementation rules" refers directly to research conducted at the University, because it enables the identification of research results with potential commercialization, and then their patenting and possible implementation.
PROJECTS:
Metagenomic analysis of bacteriomiome and mycobiome of the digestive tract in children and adolescents and their healthy siblings and healthy children with HLA DQ2 and (or) DQ8 antigens - 1 746 600 PLN – Sonata-Bis: 2017/26/E/NZ5/00266 – NCN (2018 – 2024);
Metagenomics - sequencing of the V3-V4 region of the 16S rRNA gene - sepsis diagnostics - PLN 20,000 - INNO-GENE Inc. (2017) - project completed;
Development of a molecular test differentiating infections: caused by SARS-CoV-2 and influenza viruses in COVID-19 patients

using fluorescence in situ hybridization (FISH) - 736 000 PLN "subproject" in the framework of a big project entitled "Model of multidisciplinary hospital and out-of-hospital care for patients with SARS-CoV-2 infection (25 045 123 PLN) financed under the Project "Support for single-name hospitals in the fight against the spread of SARS-CoV-2 virus infection and in the treatment of COVID-19" - SZPITALE-JEDNOIMIENNE/18/2020 - NCBiR (2020-2023) -project completed;

SPIN-OFF COMPANY:

Establishment of SepGen Sp. z o. o. (KRS 0000806410 – October 1, 2019), of which he is a member of the Management Board and President. The company's goal is to conduct further research on the commercialization of sepsis molecular diagnostic technology.

PATENTS:

 Gosiewski, T; Brzychczy-Wloch M; Sposób izolowania DNA drobnoustrojów z krwi. Pat.219490; 2014-09-24

· Gosiewski, T; Brzychczy-Wloch M; Method for efficient isolation of microbial DNA from blood. EP2888364 (B1) — 2017-11-15

· Gosiewski, T; Brzychczy-Wloch M; Method for efficient isolation of microbial DNA from blood. US9879311 (B2) — 2018-01-30

· Gosiewski, T; Brzychczy-Wloch ; Pietrzyk A; Bulanda M; Sposób jednoczesnej detekcji bakterii i grzybów w preparacie biologicznym metodą PCR oraz zestaw do detekcji bakterii i grzybów w preparacie biologicznym metodą PCR. Pat.228161; 2017-10-12

· Gosiewski, T; Brzychczy-Wloch ; Pietrzyk A; Bulanda M; Method for simultaneous detection of bacteria and fungi in a biological preparation by PCR, primers as well as bacteria and fungi detection kit. EP2999798 (B1) — 2016-12-28

· Gosiewski, T; Brzychczy-Wloch ; Pietrzyk A; Bulanda M; Method for simultaneous detection of bacteria and fungi in a biological preparation by PCR, primers as well as bacteria and fungi detection kit. US10415096 (B2) — 2019-09-17

· Gosiewski, T; Salamon D; Bulanda M; Radkowski P; Gałęzowska-Ludwig A; Wołkow P; Sroka-Oleksiak A; Startery, sposób i zestaw diagnostyczny do diagnozowania sepsy. Pat.235777; 2020-05-25

· Gosiewski, T; Salamon D; Bulanda M; Radkowski P; Gałęzowska-Ludwig A; Wołkow P; Sroka-Oleksiak A; 16S ribosomal RNA universal primers and use thereof in microbiological analysis and diagnostics. EP3320110 (B1) — 2020-12-30

Imaging and biochemical biomarkers in clinical research

Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Doctoral programme
Medical sciences

Mandatory
elective

Disciplines
Medical science

ISCED classification
0912 Medicine

Didactic cycle
2025/26

Realization year
2027/28

Lecture languages
polish, english

Block
obligatory for passing in the course of studies

Examination
credit

Period	Examination	Number of ECTS points
Semester 5	credit **Activities and hours** seminar: 15	1.0

Goals

C1	The aim of the course is to familiarize PhD students with the concept of a biomarker and selected areas of biomarker application in scientific research.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The doctoral student knows and understands the methodology of scientific research involving the use of biomarkers, specific to the discipline of medical science, to an extent that allows for the revision of existing paradigms.	SD_W02	written credit

Code	Outcomes in terms of	Effects	Examination methods
W2	The doctoral student knows and understands the world's achievements, including issues related to the use of biomarkers in selected areas of the medical sciences discipline.	SD_W08	written credit
W3	The doctoral student knows and understands selected paradigms relating to the use of biomarkers in scientific research in the discipline of medical sciences.	SD_W10	written credit
Skills – PhD student can:			
U1	The PhD student is able to plan and implement individual and team research or creative projects requiring the use of biomarkers, also in an international environment.	SD_U05	classroom observation
U2	The doctoral student is able, using his knowledge regarding the use of biomarkers in scientific research, to critically analyze and evaluate research results, expert activity and other creative work and their contribution to the development of knowledge	SD_U12	classroom observation
Social competences – PhD student is ready to:			
K1	The PhD student is ready to critically evaluate scientific achievements in the field of the use of biomarkers and expert activity within the discipline of medical sciences.	SD_K01	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
seminar	15
preparation for test	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Biomarker – definition, history, areas of application.	W1, W2, U2	seminar
2.	Biomarkers in heart and vascular diseases.	W1, W2, W3, U1, U2, K1	seminar
3.	Biomarkers in oncology on the example of gastrointestinal diseases.	W1, W2, W3, U1, U2, K1	seminar
4.	Biomarkers in hemato-oncology.	W1, W2, W3, U1, U2, K1	seminar

No.	Course content	Subject's learning outcomes	Activities
5.	Biomarkers in autoimmune diseases and allergies.	W1, W2, W3, U1, U2, K1	seminar
6.	Biomarkers in rheumatic diseases.	W1, W2, W3, U1, U2, K1	seminar
7.	Biomarkers in diseases of endocrine organs.	W1, W2, W3, U1, U2, K1	seminar

Course advanced

Teaching methods :

discussion, seminar

Activities	Examination methods	Credit conditions
seminar	classroom observation, written credit	Multiple choice test, 21 questions, to pass it is necessary to obtain 70%, i.e. 15 points. Assessment of activity during classes by the instructor.

Entry requirements

Knowledge of basic issues related to scientific research methodology.

Linking with research conducted at the university

1. Urinary Proteomics and Systems Biology Link Eight Proteins to the Higher Risk of Hypertension and Related Complications in Blacks Versus Whites.An DW, Martens DS, Mokwatsi GG, Yu YL, Chori BS, Latosinska A, Isiguzo G, Eder S, Zhang DY, Mayer G, Kruger R, Brguljan-Hitij J, Delles C, Mels CMC, Stolarz-Skrzypek K, Rajzer M, Verhamme P, Schutte AE, Nawrot TS, Li Y, Mischak H, Odili AN, Staessen JA.Proteomics. 2024 Nov 24:e202400207.
2. Osteoporosis in Relation to a Bone-Related Aging Biomarker Derived from the Urinary Proteomic Profile: A Population Study.Yu YL, Martens DS, An DW, Chori B, Latosinska A, Siwy J, Odili AN, Stolarz-Skrzypek K, Maestre GE, Asayama K, Li Y, Verhamme P, Allegaert K, Mischak H, Nawrot TS, Staessen JA.Aging Dis. 2024 Jul 29.
3. OSTEO18, a novel urinary proteomic signature, associated with osteoporosis in heart transplant recipients.Yu YL, Huang QF, An DW, Raad J, Martens DS, Latosinska A, Stolarz-Skrzypek K, Van Cleemput J, Feng YQ, Mischak H, Allegaert K, Verhamme P, Janssens S, Nawrot TS, Staessen JA.
4. Angiotensin-converting enzyme inhibitors and angiotensin-II-receptor antagonists modulate sodium handling based on endogenous lithium clearance.Cwynar M, Stolarz-Skrzypek K, Gąsowski J, Wizner B, Wojciechowska W, Olszanecka A, Gryglewska B, Dzieża-Grudnik A, Bednarski A, Krośniak M, Bartoń H, Kawecka-Jaszcz K, Rajzer M, Grodzicki T.
5. Association of Air Pollution with a Urinary Biomarker of Biological Aging and Effect Modification by Vitamin K in the FLEMENGHO Prospective Population Study.Martens DS, An DW, Yu YL, Chori BS, Wang C, Silva AI, Wei FF, Liu C, Stolarz-Skrzypek K, Rajzer M, Latosinska A, Mischak H, Staessen JA, Nawrot TS; (The FLEMENGHO Investigators).Environ Health Perspect. 2023 Dec;131(12):127011.
6. Urinary proteomics combined with home blood pressure telemonitoring for health care reform trial-First progress report.Chori BS, An DW, Martens DS, Yu YL, Gilis-Malinowska N, Abubakar SM, Ibrahim EA, Ajanya O, Abiodun OO, Anya T, Tobechukwu I, Isiguzo G, Cheng HM, Chen CH, Liao CT, Mokwatsi G, Stolarz-Skrzypek K, Wojciechowska W, Narkiewicz K, Rajzer M, Brguljan-Hitij J, Nawrot TS, Asayama K, Reyskens P, Mischak H, Odili AN, Staessen JA; UPRIGHT-HTM Investigators.J Clin Hypertens (Greenwich). 2023 Jun;25(6):521-533.
7. Ectopic, CRH-responsive Cushing syndrome with negative 68Ga-DOTATATE and 18F-FDG PET/CT imaging findings and pituitary microadenoma: a challenging case with a successful outcome.Gilis-Januszewska A, Gamrat A, Minasyan M, Bogusławska A, Rzepka E, Hubalewska-Dydejczyk A.Pol Arch Intern Med. 2023 Oct 26;133(10):16548.
8. Quantitative and qualitative assessment of a pituitary neuroendocrine tumor's T2-signal intensity in acromegaly - a call for unification.Godlewska-Nowak M, Grochowska A, Zieliński G, Bogusławska A, Adamek D, Maksymowicz M, Hubalewska-Dydejczyk A, Gilis-Januszewska A.
9. The Complexities of Diagnosis with Co-Existing Gaucher Disease and Hemato-Oncology-A Case Report and Review of the Literature.Sudul P, Piatkowska-Jakubas B, Pawlinski L, Galazka K, Sacha T, Kiec-Wilk B.J Clin Med. 2023 Aug

25;12(17):5518.

10. Prognostic Impact of Copy Number Alterations' Profile and AID/RAG Signatures in Acute Lymphoblastic Leukemia (ALL) with BCR::ABL and without Recurrent Genetic Aberrations (NEG ALL) Treated with Intensive Chemotherapy.Libura M, Karabin K, Tyrna P, Czyż A, Makuch-Łasica H, Jaźwiec B, Paluszewska M, Piątkowska-Jakubas B, Zawada M, Gniot M, Trubicka J, Szymańska M, Borg K, Więsik M, Czekalska S, Florek I, Król M, Paszkowska-Kowalewska M, Gil L, Kapelko-Słowik K, Patkowska E, Tomaszewska A, Mądry K, Machowicz R, Czerw T, Piekarska A, Dutka M, Kopińska A, Helbig G, Gromek T, Lewandowski K, Zacharczuk M, Pastwińska A, Wróbel T, Haus O, Basak G, Hołowiecki J, Juszczyński P, Lech-Marańda E, Giebel S, Jędrzejczak WW.Cancers (Basel). 2023 Nov 15;15(22):5431.

11. Salivary matrix metalloproteinase-9 (MMP-9) as a biomarker of periodontitis in pregnant patients with diabetes.Waligóra J, Kuśnierz-Cabala B, Pawlica-Gosiewska D, Gawlik K, Chomyszyn-Gajewska M, Pytko-Polończyk J.Dent Med Probl. 2023 Jan-Mar;60(1):35-45.

12. Is triggering receptor expressed on myeloid cell 1 (TREM-1) protein a new marker of serious infectious complications in colorectal surgery?: case-matched pilot study.Pisarska-Adamczyk M, Rzepa A, Kapusta M, Zawadzka K, Kuśnierz-Cabala B, Wysocki M, Małczak P, Major P, Zub-Pokrowiecka A, Wierdak M, Pędziwiatr M.Langenbecks Arch Surg. 2023 Sep 21;408(1):368.

13. Comparison of Clinical and Laboratory Characteristics in Lupus Nephritis vs. Non-Lupus Nephritis Patients-A Comprehensive Retrospective Analysis Based on 921 Patients.Kosałka-Węgiel J, Dziedzic R, Siwiec-Koźlik A, Spałkowska M, Milewski M, Wach A, Zaręba L, Bazan-Socha S, Korkosz M.J Clin Med. 2024 Jul 31;13(15):4486.

14. Clinical and laboratory characteristics of early-onset and delayed-onset lupus nephritis patients: A single-center retrospective study.Kosałka-Węgiel J, Dziedzic R, Siwiec-Koźlik A, Spałkowska M, Milewski M, Żuk-Kuwik J, Zaręba L, Bazan-Socha S, Korkosz M.Rheumatol Int. 2024 Jul;44(7):1283-1294.

15. Dissecting the importance and origin of circulating myokines in gastric cancer cachexia.Sierzega M, Drabik A, Sanak M, Chrzan R, Richter P.Front Endocrinol (Lausanne). 2024 Oct 1;15:1437197.

16. Comprehensive cancer-oriented biobanking resource of human samples for studies of post-zygotic genetic variation involved in cancer predisposition.Filipowicz N, Drężek K, Horbacz M, Wojdak A, Szymanowski J, Rychlicka-Buniowska E, Juhas U, Duzowska K, Nowikiewicz T, Stańkowska W, Chojnowska K, Andreou M, Ławrynowicz U, Wójcik M, Davies H, Śrutek E, Bieńkowski M, Milian-Ciesielska K, Zdrenka M, Ambicka A, Przewoźnik M, Harazin-Lechowska A, Adamczyk A, Kowalski J, Bała D, Wiśniewski D, Tkaczyński K, Kamecki K, Drzewiecka M, Wroński P, Siekiera J, Ratnicka I, Jankau J, Wierzba K, Skokowski J, Połom K, Przydacz M, Bełch Ł, Chłosta P, Matuszewski M, Okoń K, Rostkowska O, Hellmann A, Sasim K, Remiszewski P, Sierżęga M, Hać S, Kobiela J, Kaska Ł, Jankowski M, Hodorowicz-Zaniewska D, Jaszczyński J, Zegarski W, Makarewicz W, Pęksa R, Szpor J, Ryś J, Szylberg Ł, Piotrowski A, Dumanski JP.PLoS One. 2022 Apr 7;17(4):e0266111.

17. Sex-specific relationships of inflammatory biomarkers with blood pressure in older adults.Sulicka-Grodzicka J, Wizner B, Zdrojewski T, Mossakowska M, Puzianowska-Kuźnicka M, Chudek J, Więcek A, Korkosz M, Caiazzo E, Maffia P, Siedlinski M, Messerli FH, Guzik TJ.Geroscience. 2024 Oct;46(5):4603-4614.

18. Endothelial dysfunction and risk factors for atherosclerosis in psoriatic arthritis: overview and comparison with rheumatoid arthritis.Kaleta K, Krupa J, Suchy W, Sopel A, Korkosz M, Nowakowski J.Rheumatol Int. 2024 Sep;44(9):1587-1606.

Basics of interpersonal communication
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** polish
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0313 Psychology	**Examination** graded credit

Period Semester 5	**Examination** graded credit **Activities and hours** seminar: 10 workshop: 5	**Number of ECTS points** 1.0

Goals

C1	Characteristics of interpersonal communication rules in medical practice
C2	Getting to know the importance of good communication in medical professions in solving clinical problems
C3	Learning methods for further education and research on interpersonal medical communication, also in teams of professionals

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	rules of professional interpersonal communication and understands the use of different styles of conversations in solving health problems	SD_W09	classroom observation, essay, clinical case presentation
Skills – PhD student can:			
U1	use knowledge about the therapeutic relationship and interpersonal communication to solve health problems or plan the research	SD_U13	classroom observation, essay, clinical case presentation
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to recognize the importance of professional interpersonal communication skills in solving cognitive and practical problems	SD_K08	classroom observation, essay, clinical case presentation

Calculation of ECTS points

Activity form	Activity hours*
seminar	10
workshop	5
preparation for classes	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	The introdunction to interpersonal communication	W1, U1, K1	seminar
2.	The communication in everyday clinical practice	W1, U1, K1	seminar, workshop
3.	The strategies and problems in communication doctor-patient.	W1, U1, K1	seminar, workshop
4.	Initating and building relationship doctor - patient , based on effective communication.	W1, U1, K1	seminar, workshop
5.	Responding empathetically on patient expectations-EMPATHY protocol.	W1, U1, K1	seminar, workshop
6.	Communication with patients with mental disorders.	W1, U1, K1	seminar
7.	Communication in the treatment team.	W1, U1, K1	seminar, workshop

Course advanced

Teaching methods :

case study, classes / practicals, discussion, educational film, seminar, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
seminar	essay, clinical case presentation	Evaluation criteria: Attendance and active participation in course, as well as the preparation of a written report and the presentation during classes of a case study focusing on issues related to doctor-patient communication.
workshop	classroom observation	doctoral activity during classes

Entry requirements

Doctoral Students interested in the issues of medical communication

Linking with research conducted at the university

The research on empathy in medicine students
The research on the interpersonal competences of doctors in the relationship with oncological patients as the predictor of job satisfaction and burnout.

Media in scientific work
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** polish
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0417 Work skills	**Examination** credit

Period Semester 5	**Examination** credit **Activities and hours** classes: 10	**Number of ECTS points** 1.0

Goals

C1	Familiarizing doctoral students with the principles of scientific communication.
C2	Developing the skills necessary to prepare a website that is the scientist's showcase.
C3	Developing the skills necessary to prepare a pop-science article.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	rules for disseminating the results of scientific activities	SD_W06	essay
Skills – PhD student can:			

Code	Outcomes in terms of	Effects	Examination methods
U1	disseminate the results of scientific activities also in popular science forms	SD_U02	classroom observation, essay, project
Social competences – PhD student is ready to:			
K1	fulfilling researchers' social obligations, e.g., by providing society with information regarding scientific achievements in an appropriate manner	SD_K05	classroom observation, essay, project

Calculation of ECTS points

Activity form	Activity hours*
classes	10
preparation for classes	10
preparation of a project	10
PhD student workload	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Creating a website using the WordPress platform.	W1, U1	classes
2.	Social media as a way to establish contacts among the academic community, look for a job and promote scientific research results.	W1, U1, K1	classes
3.	Preparing materials for the media (e.g. press release) to promote research and its results.	W1, U1, K1	classes

Course advanced

Teaching methods :

brainstorm, classes / practicals, computer classes, discussion, group work, Tutoring

Activities	Examination methods	Credit conditions
classes	classroom observation, essay, project	The final grade is for the project - the website (40%) and activity during classes (10%).

Additional info

In the tasks required to pass the course, the achievement of learning outcomes in terms of knowledge and skills will be checked. One unexcused absence is allowed in the course.

Entry requirements

None.

Linking with research conducted at the university

Projects:

2023-2024 Maternity and reproductive care strategies among Ukrainian migrant women in Poland at the time of war, national Polish National Agency for Academic Exchange

2013-2014 Mothers, grandmothers and the evolution of prolonged lifespan in humans: age- and environment-specific costs of reproduction, Ministry of Science and Higher Education

Publications:

1. Nenko I, Kopeć-Godlewska K, Towner MC, Klein LD, Micek A. 2023. Emotional factors, medical interventions and mode of birth among low-risk primiparous women in Polan. Evolution, Medicine, and Public Health 139-148
2. Nenko I, Chapman SN, Lahdenperä M, Pettay JE, Lummaa V. 2021. Will granny save me? Birth status, survival, and the role of grandmothers in historical Finland. Evolution and Human Behavior 42: 239-246
3. Miłkowska K, Nenko I, Klimek M, Galbarczyk A, Jasienska G. 2020. Season of birth and biomarkers of early-life environment. American Journal of Human Biology. e23502
4. Nenko I, Hayward AD, Simons MJP, Lummaa V. 2018. Early-life environment and differences in costs of reproduction in a preindustrial human population, PloS ONE, 13: e020723

Pop-science articles:

1. Nenko I. Położna przy porodzie najlepszą inwestycją!, Blog Zdrowia Publicznego, 18.12.2023, https://izp.wnz.cm.uj.edu.pl/pl/blog/publikacja-polozna-przy-porodzie-najlepsza-inwestycja/
2. Nenko I. Wiemy, jak zatrzymać rosnące wskaźniki porodów drogą cięcia cesarskiego, Gazeta Wyborcza, 06.07.2023, https://wyborcza.pl/7,75400,29945867,specjalistka-zdrowia-publicznego-wiemy-jak-zatrzymac-rosnace.html
3. Nenko I. Rośnie liczba cesarskich cięć na świecie. Oto powody. Onet Nauka, 19.11.2022, https://wiadomosci.onet.pl/nauka/rosnie-liczba-cesarskich-ciec-na-swiecie-oto-powody/c8e5kh4
4. Nenko I. Nie ma jak u … babci? Projektor Jagielloński, 2021, 3: 139
5. Nenko I & Jasienska G. Development, breast cancer, fertility and mate preferences – evolutionary ways of looking at human health, NJUsletter, 65: 18-21

Science publications; submission for printing, sharing and popularization
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** polish
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 5	**Examination** graded credit **Activities and hours** seminar: 5 classes: 5	**Number of ECTS points** 1.0

Goals

C1	Familiarization with the types of scientific publications and the principles of their preparation.
C2	Learning the rules of presenting results at scientific conferences and in the form of popular science.
C3	Enhancing doctoral candidates' competencies in disseminating and transferring the results of scientific research at both national and international levels.
C4	Developing skills in documenting and presenting the results of research work, preparing scientific publications, and transferring research findings to the economic and social spheres.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The doctoral student knows and understands the rules of disseminating the results of scientific activity, also in open access mode, and the basic rules of knowledge transfer to the economic and social sphere, including the basic rules of commercialization of the results of scientific activity and know-how related to these results.	SD_W06	self-assessment, assignment report
W2	The doctoral student has knowledge about knowledge transfer and commercialization of scientific research results.	SD_W04	self-assessment, assignment report
Skills – PhD student can:			
U1	The doctoral student is able to document and present the results of research work and prepare scientific publications - in accordance with the rules of creating such studies and respecting the rules of intellectual property protection.	SD_U06	self-assessment, assignment report
U2	The doctoral student is able to disseminate or transfer the results of scientific activity also in popular forms.	SD_U02	self-assessment, assignment report
U3	The doctoral student is able to transfer the results of research work to the economic and social sphere, is able to analyze the possibilities of transferring the results of research work to the economic and social sphere and initiate actions aimed at implementing such a transfer.	SD_U10	self-assessment, assignment report
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to fulfill the social obligations of researchers and creators, as well as initiating actions for the public interest, including by providing society in an appropriate way with information and opinions on the achievements of science, involvement in the education of specialists and other activities leading to the development of a civil society based on knowledge.	SD_K05	self-assessment, assignment report

Calculation of ECTS points

Activity form	Activity hours*
seminar	5
classes	5
preparation of a report	10
independent education	10
PhD student workload	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Discussion of the meaning and purpose of the dissemination of scientific research findings.	W1, W2, U1, U2, U3, K1	classes, seminar
2.	Identification of target groups, e.g., the scientific community, practitioners, patients, industry groups, non-governmental organizations, political decision-makers, and the general public.	W1, W2, U1, U2, U3, K1	classes, seminar
3.	Dissemination channels: Selection of appropriate channels based on the goals and target audiences.	W1, U1, U2, U3, K1	classes, seminar
4.	Reviews – types and methodology of literature review.	W2, U2, U3, K1	classes, seminar
5.	Graphics in scientific publications.	W1, W2, U1, U2, U3, K1	classes, seminar
6.	Database of scientific journals including humanities, social sciences and medical research.	W2, U2, U3, K1	classes, seminar
7.	How to choose the right scientific journal to publishing own research results.	W1, W2, U1, U2, U3, K1	classes, seminar
8.	Public speaking - scientific conferences.	W1, W2, U1, U2, U3, K1	classes, seminar

Course advanced

Teaching methods :

textual analysis, classes / practicals, discussion, problem solving method, group work, seminar

Activities	Examination methods	Credit conditions
seminar	self-assessment, assignment report	Passing the module for a grade requires meeting each of the following conditions: 1. Active presence in classes in your exercise group. 2. Completion of tasks during classes (at least 60%) and submission of a report. 3. The final grade for the subject will be calculated as the arithmetic average of partial grades.
classes	self-assessment, assignment report	Passing the module for a grade requires meeting each of the following conditions: 1. Active presence in classes in your exercise group. 2. Completion of tasks during classes (at least 60%) and submission of a report. 3. The final grade for the subject will be calculated as the arithmetic average of partial grades.

Additional info

Not applicable.

Entry requirements

Knowledge of research methodology issues.

Linking with research conducted at the university

1. Bilski, J., A. Schramm-Luc, M. Szczepanik, A. I. Mazur-Bialy, J. Bonior, K. Luc, K. Zawojska and J. Szklarczyk (2023).

"Adipokines in Rheumatoid Arthritis: Emerging Biomarkers and Therapeutic Targets." Biomedicines 11(11).

2.   Jozwik, A., A. Wnuk-Scardaccione and J. Bilski (2024). "Comparative Analysis of Lower Back Pain and Phantom Pain in Unilateral Lower Limb Amputees: A Study on Amputee Football Players vs. Non-Athletes." Medicina (Kaunas) 60(12): 2047.

3.   Kołomańska-Bogucka, D., N. Pławiak and A. I. Mazur-Bialy (2023). "The impact of the COVID-19 pandemic on the level of physical activity, emotional state, and health habits of women in late pregnancy and early puerperium." International Journal of Environmental Research and Public Health 20(3): 1852.

4.   Mazur-Bialy, A., S. Tim, D. Kołomańska-Bogucka, B. Burzyński, T. Jurys and N. Pławiak (2023). "Physiotherapy as an effective method to support the treatment of male urinary incontinence: a systematic review." Journal of Clinical Medicine 12(7): 2536.

5.   Mazur-Bialy, A., S. Tim, A. Pępek, K. Skotniczna and G. Naprawa (2024). "Holistic approaches in endometriosis-as an effective method of supporting traditional treatment: a systematic search and narrative review." Reproductive Sciences: 1-18.

6.   Mazur-Bialy, A. I. (2023). "Asprosin enhances cytokine production by a co-culture of fully differentiated mature adipocytes and macrophages leading to the exacerbation of the condition typical of obesity-related inflammation." International Journal of Molecular Sciences 24(6): 5745.

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The lifecycle of a publication; from submission to open science and to promotion
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 5	Examination graded credit **Activities and hours** seminar: 15 workshop: 15	Number of ECTS points 2.0

Goals

C1	The main objective of the course is to prepare participants to independently publish and promote a scientific article in the Open Science framework.
C2	Phd students will learn how to manage the editorial process: write a cover letter, respond to reviews, respond to requests of data sharing, and correct proofs of an article.
C3	PhD students will be acquainted with the idea of preregistration and open science framework (OSF), and will be able to establish project's website on the OSF platform.
C4	Phd students will learn about effective tools for sharing information about their publications with academic community and a general public.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	PhD student knows and understands the rules for scientific results dissemination, also in the open access mode, and the basic principles for the knowledge transfer to the economic and social sphere, including the basic principles for the commercialization of scientific research activity and know-how related to these results.	SD_W06	classroom observation, project
W2	PhD student knows and understands global achievements, including theoretical foundations, general issues and selected specific issues related to the discipline in which the doctoral dissertation is prepared.	SD_W08	classroom observation
W3	PhD student knows and understands the main development trends of scientific disciplines crucial for education in medical and health sciences.	SD_W09	classroom observation
W4	PhD student knows and understands selected paradigms in the field of science in which the doctoral programme is carried out.	SD_W10	classroom observation
Skills – PhD student can:			
U1	PhD student can disseminate or transfer the results of scientific activities also in popular form.	SD_U02	classroom observation, project
U2	PhD student can plan and implement an individual or team research or creative project, also in an international environment	SD_U05	classroom observation, project
U3	PhD student can document and present research work results and prepare scientific publications, respecting applicable principles and intellectual property protection rules.	SD_U06	classroom observation, project
Social competences – PhD student is ready to:			
K1	PhD student is ready to maintain and develop the ethos of research and creative environments, including independent researching, taking into account i.a. existing financial and infrastructural constraints; is prepared to respect the principle of public ownership of research results together with the principles of intellectual property protection	SD_K07	classroom observation
K2	PhD student can recognize the importance of knowledge from other disciplines and domains (other than that the one in which the doctoral programme is implemented) in addressing cognitive and practical problems	SD_K08	classroom observation
K3	PhD student is ready to take into account in his/her research the solutions proposed by other disciplines of knowledge	SD_K09	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
seminar	15
workshop	15
independent education	15
preparation of a project	15

	Hours
PhD student workload	60
Workload involving teacher	30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Editorial proceses • Writing a letter to an editor. Presenting the manuscript and reasons why it should be published • Rejection of a manuscript at the editorial stage. What's next? • Reading reviews and responding to them • Revising the manuscript • Reading and correcting proofs of an article	W4, U2, U3, K1, K2, K3	seminar, workshop
2.	Open science movement • Preprint and preregistration possibilities • Making your data public in a safe and ethical way • Hands on experience using Open Science Framework platform	W1, W2, W3, K1, K2, K3	seminar, workshop
3.	Scientific communication • Good practices in scientific communication and their validity • Social media – why and how to use them in scientific communication? • Writing and speaking about science in an interesting and understandable way for a wide audience	W1, U1, K1, K2, K3	seminar, workshop

Course advanced

Teaching methods :

textual analysis, brainstorm, demonstration, discussion, group work, seminar, workshop, lecture, practical classes

Activities	Examination methods	Credit conditions
seminar	classroom observation	Active participation in classes, expression ideas during classes, answering questions asked by the lecturers.
workshop	project	Preparation of three student's projects: composing a letter to the editor, creating a project's website on the OSF platform and writing a popular science article.Każdy z trzech proponowanych bloków będzie składał się zarówno z seminariów, jak i warsztatów. Każdy blok zakończy się projektem, który studenci przygotują indywidualnie lub w małej grupie. Ostateczne warunki zaliczenia będą oparte na: złożeniu każdego z trzech projektów oraz aktywnym udziale studentów w

Additional info

Each of the proposed blocks will consist of both seminars and workshops.
Three blocks will finish with a project that students will prepare individually or in a small group.
The final credit conditions will be based on: submission of each of three projects and students' active participation in the workshops.

Entry requirements

Knowledge of English language

Linking with research conducted at the university

Publishing scientific articles is one of the core duties of researchers in all disciplines. Health sciences and medicine convey a great additional responsibility as published results frequently have important real life application. Jagiellonian University Medical College is a leading academic entity in scientific publishing. All three instructors of the course have vast experience in publishing and promoting scientific articles, however each of them possess additional skills from the topic she will be presenting to students. Additionally, good practices employed in the Department of Environmental Health will be presented and discussed.

English in biomedical research C1
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0231 Language acquisition	**Examination** - graded credit

Period Semester 5	Examination - **Activities and hours** foreign language course: 7 e-learning foreign language course: 8	Number of ECTS points 0.0

Period Semester 6	Examination graded credit **Activities and hours** foreign language course: 8 e-learning foreign language course: 7	Number of ECTS points 2.0

Goals

C1	The aim of the course is to develop the ability to present English-language articles thematically related with a given discipline and the individual research plan of the student.
C2	The aim of the course is to develop the ability to understand discussions about English-language articles thematically related to a given discipline, and the individual research plan of the student.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The doctoral student knows and understands the world's achievements, including theoretical foundations, general issues and selected detailed issues relevant to the discipline in which the doctoral dissertation is compiledThe doctoral student knows and understands the world's achievements, including theoretical foundations, general issues and selected detailed issues relevant to the discipline in which the doctoral dissertation is prepared.	SD_W08	classroom observation
Skills – PhD student can:			
U1	The doctoral student is able to use a modern foreign language to the extent that enables them participation in an international scientific and professional environment, in particular in connection with participation in conferences, seminars, workshops, etc. in the country and abroad - establish contacts for the exchange of experiences and communicate on specialist topics on level B2 of the Common European Framework of Reference for Languages, with specialists in their scientific and professional discipline, as well as with people representing other scientific environments.	SD_U04, SD_U17	oral answer
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to critically evaluate the scientific achievements and expert activity within the scientific discipline in which the doctoral dissertation is prepared.	SD_K01	oral answer

Calculation of ECTS points

Semester 5

Activity form	Activity hours*
foreign language course	7
e-learning foreign language course	8
independent education	5
preparation for classes	5
preparation of multimedia presentation	5
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 6

Activity form	Activity hours*
foreign language course	8
e-learning foreign language course	7
preparation for classes	5
independent education	5
preparation of multimedia presentation	5
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	First term · Linguistic resources needed to present a summary of an article. · Basic academic vocabulary. · Topics of abstracts selected by students of doctoral school.	W1, U1, K1	foreign language course, e-learning foreign language course
2.	Second term · Vocabulary needed for participation in conferences · Topics of abstracts selected by students of the doctoral school.	W1, U1, K1	foreign language course, e-learning foreign language course

Course advanced

Semester 5

Teaching methods :

e-learning, foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, oral answer	Graded credit. 1. 2. Assessment of activity during classes made by the instructor. 3. Assessment of the quality of the prepared abstracts. 4. Attendance at classes. Any absence must be justified and made up in the prescribed manner by the lecturer. The grading scale applies: 0-59 % – fail 60-70 % – sufficient 71-75% - sufficientplus 76-85% – good 86-90 % – good plus 91-100 % –very good

Activities	Examination methods	Credit conditions
e-learning foreign language course	classroom observation, oral answer	Graded credit. 1. 2. Assessment of activity during classes made by the instructor. 3. Assessment of the quality of the prepared abstracts. 4. Attendance at classes. Any absence must be justified and made up in the prescribed manner by the lecturer. The grading scale applies: 0-59 % – fail 60-70 % – sufficient 71-75% - sufficientplus 76-85% – good 86-90 % – good plus 91-100 % –very good

Semester 6

Teaching methods :

e-learning, foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, oral answer	Graded credit. 1. 2. Assessment of activity during classes made by the instructor. 3. Assessment of the quality of the prepared abstracts. 4. Attendance at classes. Any absence must be justified and made up in the prescribed manner by the lecturer. The grading scale applies: 0-59 % – fail 60-70 % – sufficient 71-75% - sufficientplus 76-85% – good 86-90 % – good plus 91-100 % –very good
e-learning foreign language course	classroom observation, oral answer	Graded credit. 1. 2. Assessment of activity during classes made by the instructor. 3. Assessment of the quality of the prepared abstracts. 4. Attendance at classes. Any absence must be justified and made up in the prescribed manner by the lecturer. The grading scale applies: 0-59 % – fail 60-70 % – sufficient 71-75% - sufficientplus 76-85% – good 86-90 % – good plus 91-100 % –very good

Additional info

Delivering presentations

Linking with research conducted at the university

Not applicable

Exercise physiology and its importance in medicine and rehabilitation
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Doctoral programme
Health sciences

Mandatory
elective

Disciplines
Health science

ISCED classification
0915 Therapy and rehabilitation

Didactic cycle
2025/26

Realization year
2027/28

Lecture languages
polish, english

Block
obligatory for passing in the course of studies

Examination
graded credit

Period	Examination	Number of
Semester 5	graded credit	**ECTS points**
		1.0
	Activities and hours	
	seminar: 16	

Goals

C1	To familiarize the PhD students with the physiological responses to physical exercise and the mechanisms of human body adaptation to regular physical activity.
C2	To present the modern concepts of exercise physiology, that are applicable in both health-related and rehabilitation training.
C3	To familiarize the PhD students with the methods of assessment of human exercise tolerance in patients and in healthy people, including athletes.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	exercise responses and processes of adaptation of the human body to regular physical activity.	SD_W08, SD_W10	essay, assignment report, credit
W2	effective planning of the health-related and rehabilitation training programs based on the key concepts of exercise physiology.	SD_W08, SD_W10	essay, credit
W3	examination of human exercise capacity and interpretations of tests results.	SD_W08, SD_W09	essay, assignment report, credit
Skills – PhD student can:			
U1	use the knowledge of exercise physiology in clinical and rehabilitation practice.	SD_U13, SD_U14	assignment report, credit
U2	carry out exercise tests and assess the exercise capacity of patients and healthy people.	SD_U11, SD_U13	assignment report, credit
Social competences – PhD student is ready to:			
K1	use of a regular physical activity as a tool for health maintenance, preservation of noncommunicable / lifestyle diseases and in physical rehabilitation programs in humans.	SD_K08, SD_K09	credit
K2	identify a potential harmful effects of improper exercise intervention programs on human health.	SD_K09	assignment report, credit

Calculation of ECTS points

Activity form	Activity hours*
seminar	16
preparation for classes	2
preparation of a report	2
preparation for colloquium	10

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 16

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Exercise physiology – historical perspective (from Hill, Briggs and Krogh to Holloszy and Saltin). Modern methods of exercise physical capacity testing. Indicators of humans exercise physical capacity. Exercise intensity domains.	W2, W3	seminar

No.	Course content	Subject's learning outcomes	Activities
2.	Maximal muscle strength and maximal power output in young and old people. Laboratory assessment of maximal muscle strength and maximal muscle power output.	W1, W2, U1, U2, K1	seminar
3.	Types of skeletal muscle fibers and their importance in physical exercise. Ageing of skeletal muscles. Bioenergetics during exercise of different power output and duration.	W1, W2, W3, U1, K1	seminar
4.	Cardiorespiratory response during exercise (CO, SV, HR, BP, VE, VO2, VCO2, RER) and its interpretation. Maximal oxygen uptake (VO2max) and factors limiting VO2max. Laboratory assessment of maximal oxygen uptake.	W1, W2, U1, U2, K1	seminar
5.	Acid-base balance during exercise. Biochemical background of the lactate threshold (LT) and its application in physical training. Fatigue during exercise – symptoms and causes.	W1, W2, W3, U1, K1	seminar
6.	Exercise protocols used in physical exercise capacity examination. Exercise intensity monitoring. Laboratory assessment of physical performance and training effects. Principles of load settings on different kinds of cycle ergometers.	W2, W3, U1, U2, K1	seminar
7.	Exercise tests in clinical practice. Exercise prescriptions for health and fitness. Selected exercise tests to evaluate cardiorespiratory fitness, among others: Astrand test, Margaria test, PWC170 (150) test, Zoladz test.	W3, U2, K2	seminar
8.	Final examination.	W1, W2, W3, U1, U2, K1, K2	seminar

Course advanced

Teaching methods :

laboratories (labs), educational film, presentation, group work, seminar

Activities	Examination methods	Credit conditions
seminar	essay, assignment report, credit	1. Attendance at seminars (minimum of 7 seminars). 2. Participation in the laboratory exercises, having a set of individually prepared materials (for seminars no. 2, 3, 4, 5, 7) and reports (seminars no. 2, 4, 5, 6, 7). Detailed topics of materials and reports will be given in class. 3. Graded credit (70% - 3.0; 75% - 3.5; 80% - 4.0; 85% - 4.5; 90% - 5.0).

Entry requirements

Basics of human biology, anatomy, biochemistry and physiology.

Linking with research conducted at the university

The course is related to exercise physiology, applicable to all research programs in which exercise interventions are performed (e.g., diagnostics of patient exercise physical capacity, rehabilitation programs, training programs in healthy

subjects, patients and athletes). Physical exercise can be used both as a scientific model to study human physiology / pathophysiology as well as a prevention and treatment in several diseases, especially noncommunicable / lifestyle diseases.

![Jagiellonian University Medical College logo]

Research determinants in selected areas of health sciences
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Health sciences	**Lecture languages** polish
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Health science	**Examination** graded credit
ISCED classification 0917 Traditional and complementary medicine and therapy	

Period Semester 5	Examination graded credit Activities and hours seminar: 15	Number of ECTS points 2.0

Goals

C1	The aim is to provide doctoral students with knowledge on the conditions for conducting scientific research in selected areas of health sciences (nursing, midwifery, physiotherapy, electroradiology) and the possibility of using the obtained evidence in practice.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The doctoral student knows and understands the principles of conducting scientific research within the discipline of health sciences	SD_W01	project

Code	Outcomes in terms of	Effects	Examination methods
W2	The doctoral student knows and understands the principles of creating a research model in quantitative and qualitative research	SD_W01, SD_W02	group assessment, essay
W3	The doctoral student knows and understands the principles of formulating the research goal, determining variables, formulating research problems and building hypotheses	SD_W02	essay, project
W4	The doctoral student knows and understands the selection of research tools in the research model, including the preparation of original research tools, the use of available standardized tools and the adaptation and validation of research tools in health sciences	SD_W02, SD_W09	group assessment, essay
W5	The doctoral student knows and understands the principles of analyzing research results, drawing conclusions and based on them, building implications for practice in health sciences	SD_W08, SD_W09	essay
W6	The doctoral student knows and understands the principles of preparing research results for publication, including preparing a scientific article, recommendation, and scientific report	SD_W06	essay
Skills – PhD student can:			
U1	The doctoral student is able to develop a research model in a quantitative and qualitative study	SD_U01	essay, project
U2	The doctoral student is able to formulate the purpose of the study, determine variables, develop research problems and hypotheses in a quantitative study in typical health science research.	SD_U01	group assessment, essay
U3	The doctoral student is able to prepare an original research tool, use available standardized tools and understand the process of adaptation and validation of research tools in health sciences	SD_U05	essay, project
U4	The doctoral student is able to carry out simple analyzes of research results, draw conclusions and indicate conclusions that can be implemented into practice in health sciences	SD_U05, SD_U06	essay
U5	The doctoral student is able to prepare recommendations or scientific reports based on the results obtained	SD_U06	essay, project
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to use the achievements of other scientific disciplines and to think critically about his own results and those of other researchers	SD_K01, SD_K02, SD_K06	group assessment

Calculation of ECTS points

Activity form	Activity hours*
seminar	15

preparation for classes	15
conducting empirical research	15
preparation of a project	15

PhD student workload	**Hours** 60
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Research Model, Principles of Preparation in Quantitative and Qualitative Research in Health Sciences	W1, W2, U1	seminar
2.	Formulating the purpose of the study, indicating dependent and independent variables, building research problems and hypotheses in relation to selected areas in health sciences	W3, U2	seminar
3.	Research tools in health sciences: proprietary, standardized, adaptation and validation of research tools used in quantitative methods	W4, U3	seminar
4.	Analysis of research results, inferences and, on their basis, building implications for practice in health sciences	W5, U4	seminar
5.	Rules for publishing research results, preparation of a scientific article, recommendation, scientific report	W6, U5, K1	seminar

Course advanced

Teaching methods :

case study, textual analysis, brainstorm, problem solving method, project method, group work, assignments solving, participation in research, Tutoring

Activities	Examination methods	Credit conditions
seminar	group assessment, essay, project	Passing on the basis of the completion of tasks constituting the content of individual seminars - 50% of the final grade, written work (final project) - 50% of the final grade

Additional info

clear

During classes at individual seminars, in accordance with the tasks indicated by the instructor, the effect will be assessed in

the form of points obtained 0-10, where at least 7 points constitute the basis for passing the task. There are planned 4 tasks during the seminars, for which the doctoral student can obtain a total of 0-40 points. The basis for passing the classes is obtaining at least 28 points. At the end of the classes, the doctoral student prepares a final task (project) - a developed research model in the form of a quantitative study with the obtained results and a final study in the form of recommendations for professional practice in selected areas of health sciences - Obtained points maximum 40 points (at least 28 points are required to pass the work). The final grade is the sum of points maximum 80, where the basis for passing is obtaining at least 56 points in total (where 28 points are the credit obtained during the seminars and 28 points from the final project). Final grade 56 pts.-60 pts., (sufficient), 61 pts.-64 pts. (sufficient plus), 65 pts.-69 pts. (good), 70 pts.-74 pts. (good plus), 75 pts.-80 pts. (very good)

Entry requirements

Passing compulsory classes in the subject General Methodology of Scientific Research, experience in conducting scientific research, e.g. author of a diploma (master's) thesis, co-author of a scientific work published or accepted for publication in a scientific journal/monograph

Linking with research conducted at the university

The Institute of Nursing and Midwifery conducts, among others, research: N43/DBS/000244 Adverse events and medical errors in the context of rationing nursing care N43/DBS/000245 Burnout and chronic fatigue, insomnia, psychosocial working conditions among nurses employed in hospitals in Małopolska Nothing about us without us? Ethics of research with underrepresented groups on the example of deaf people (PRELUDIUM, NCN), Patient in the center? Bioethical aspects of the use of adaptive methods in clinical trials involving humans (NCN)

Selected aspects of pharmocotherapy safety
Educational subject description sheet

Basic information

Organizational unit
Doctoral School of Medical and Health Sciences

Programme
Interdisciplinary program in Medical and Health Sciences

Doctoral programme
Pharmaceutical sciences

Mandatory
elective

Disciplines
Pharmaceutical science

ISCED classification
0916 Pharmacy

Didactic cycle
2025/26

Realization year
2027/28

Lecture languages
polish, english

Block
obligatory for passing in the course of studies

Examination
graded credit

Period	Examination	Number of ECTS points
Semester 5	graded credit	1.0
	Activities and hours classes: 7 seminar: 4 e-learning seminar: 2 e-learning classes: 2	

Goals

C1	Familiarization of doctoral students with the most common side effects of drugs from selected therapeutic groups (aminoglycoside antibiotics, vancomycin, antifungals, antiepileptics, immunosuppressants, anticancer agents, antidepressants, and lithium salts).
C2	Presentation of methods that may used to prevent these effects with particular emphasis on the role of therapeutic drug monitoring and pharmacogenetic tests.
C3	Presentation of in vitro methods for assessing drug safety.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	research methodology covering theoretical foundations and general issues related to ensuring the safety of pharmacotherapy	SD_W01, SD_W08	multiple choice test
W2	research methodology covering selected detailed issues regarding the assessment of the risk of side effects of drug candidates and drugs used in the treatment of selected diseases	SD_W02, SD_W08	multiple choice test
W3	main development trends in scientific disciplines important for education in the field of medical sciences and health sciences, with particular emphasis on new techniques and procedures aimed at ensuring a safe dose/dose regimen for an individual patient	SD_W02, SD_W08	multiple choice test
Skills – PhD student can:			
U1	using the acquired knowledge, critically analyze and evaluate the results of scientific research in the field of pharmacology and clinical pharmacokinetics, as well as pharmacogenetics and his/her own contribution to the development of these disciplines, formulate new solutions to problems within existing and modified methodological paradigms; creatively apply and develop methods, techniques and research tools appropriate for searching for new solutions in the selection of the appropriate dose/dosing regimen, indicate, based on the results of scientific research, the causes of variability in the pharmacokinetics of a drug	SD_U01, SD_U14	multiple choice test
U2	using the acquired knowledge, critically analyze and evaluate research results and their contribution to the development of clinical pharmacokinetics and related new computational techniques and in vitro methods ensuring effective and safe pharmacotherapy	SD_U01, SD_U12, SD_U14	classroom observation
U3	participate in scientific discourse and initiate debate on the appropriate approach to ensuring proper patient care	SD_U07	classroom observation
Social competences – PhD student is ready to:			
K1	taking into account in their research solutions proposed by other disciplines and fields of knowledge, especially proteomics, NGS, or MR imaging	SD_K09	oral answer
K2	recognizing the importance of knowledge from disciplines and fields of knowledge other than that in which the doctoral project is being carried out, e.g. microfluidics, bioinformatics and systems biology	SD_K08	oral answer

Calculation of ECTS points

Activity form	Activity hours*
classes	7
seminar	4

case analysis	3
independent education	5
preparation for colloquium	5
analysis of the research material	2
e-learning seminar	2
e-learning classes	2
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Therapeutic drug monitoring (TDM) as a method of preventing side effects of drugs from various therapeutic groups - theoretical basis. Analytical and computational methods used in TDM.	W1, W3, U1, U2, U3, K1	seminar
2.	Calculation of drug dose/dosing schedule to prevent side effects based on equations, nomograms and computer programs.	W3, U1, K1	classes
3.	Drugs with a proven relationship between side effects - drug concentration in the blood or area under the concentration-time curve - analysis of clinical cases.	W3, K2	classes
4.	Definition of pharmacogenetics and pharmacogenomics, genetic polymorphism. Effect of polymorphism of genes encoding enzymes metabolizing drugs and drug transporters on drug pharmacokinetics and occurrence of adverse effects. Pharmacogenetic and pharmacogenomic methods used in clinical practice.	W1, U1, K2	e-learning seminar
5.	Importance of clinical genotyping and phenotyping of drug metabolizing enzymes and drug transporters in pharmacotherapy. Selection of the drug dosing regimen based on the patient genotype.	W2, W3, U2, K1	e-learning classes
6.	In vitro methods used in the assessment of drug safety (cardiotoxicity, genotoxicity and cytotoxicity tests).	W1, W2, U2, K1	seminar
7.	Research methodology and equipment available at the Faculty of Pharmacy of the Jagiellonian University Medical College for assessing the safety of new active substances.	W3, U1, K1	classes

Course advanced

Teaching methods :

case study, brainstorm, computer classes, demonstration, discussion, e-learning, assignments solving, seminar

Activities	Examination methods	Credit conditions
classes	classroom observation, oral answer	Positive assessment of activity during classes by the teacher (in the form of pluses on the attendance list) and correctness of solving clinical problems.
seminar	multiple choice test	Positive grade in the final test. The test consists of 20 questions, each rated on a 0-1 point scale, for which one can score a maximum of 20 points. To get pass, at least 12 points must be obtained.
e-learning seminar	multiple choice test	Positive grade in the final test. The test consists of 20 questions, each rated on a 0-1 point scale, for which one can score a maximum of 20 points. To get pass, at least 12 points must be obtained.
e-learning classes	classroom observation, oral answer	Positive assessment of activity during classes by the teacher (in the form of pluses on the attendance list) and correctness of solving clinical problems.

Entry requirements

Knowledge of biology, biochemistry and human physiology.

Linking with research conducted at the university

The subject of the faculty is related to research on the clinical pharmacokinetics of selected drugs and the search for correlations between genotype and pharmacokinetics, among others, in order to prevent side effects, as well as with in vitro tests used to assess the safety of new active substances. As a result of this research, the following works were published:
1. Gawrońska-Szklarz B., Adamiak-Giera U., Wyska E., Kurzawski M., Górnik W., Kałdońska M., Droździk M.: CYP2C19 polymorphism affects single-dose pharmacokinetics of oral pantoprazole in healthy volunteers. Eur. J. Clin. Pharmacol. 2012, 68: 1267-1274.
2. Cios A., Wyska E., Szymura-Oleksiak J., Grodzicki T.: Population pharmacokinetic analysis of ciprofloxacin in the elderly patients with lower respiratory tract infections. Exp. Gerontol. 2014, 57: 107–113.
3. Powroźnik B., Słoczyńska K., Marciniec K., Zajdel P., Pękala E.: Preliminary safety assessment of new azinesulfonamide analogs of aripiprazole using prokaryotic models. Adv. Pharm. Bull. 2016, 6: 377-384.
4. Kurzawski M., Gawrońska-Szklarz B., Adamiak-Giera U., Wyska E., Droździk M., Szeląg-Pieniek S.: Cytochrome P450 oxidoreductase genetic polymorphism and pantoprazole pharmacokinetics in healthy volunteers Pomeranian J. Life Sci. 2018: t. 64, nr 2, s. 27-30.
5. Cwiklinska M., Czogala M., Kwiecinska K., Madetko-Talowska A., Szafarz M., Pawinska K.   Wieczorek A., Klekawka T., Rej M., Stepien K., Halubiec P., Lazarczyk A., Miklusiak K., Bik-Multanowski M., Balwierz W., Skoczen S.: Polymorphisms of SLC19A1 80 G>A, MTHFR 677 C>T, and tandem TS repeats influence pharmacokinetics, acute liver toxicity, and vomiting in children with acute lymphoblastic leukemia treated with high doses of methotrexate. Front Pediatr. 2020, 8: 307.
6. Wójcik-Pszczoła K., Szafarz M., Pociecha K., Słoczyńska K., Piska K., Koczurkiewicz-Adamczyk K., Kocot N., Chłoń-Rzepa G., Pękala E., Wyska E.: In silico and in vitro ADME-Tox analysis and in vivo pharmacokinetic study of representative pan-PDE inhibitors from the group of 7,8-disubstituted derivatives of 1,3-dimethyl-7H-purine-2,6-dione. Toxicol. Appl. Pharmacol. 2022, 457: 116318.

Spanish language
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** spanish
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0231 Language acquisition	**Examination** - graded credit

Period	Examination	Number of ECTS points
Period Semester 5	Examination - **Activities and hours** foreign language course: 15	Number of ECTS points 0.0
Period Semester 6	Examination graded credit **Activities and hours** foreign language course: 15	Number of ECTS points 2.0

Goals

C1	Developing the ability to present Spanish-language publications thematically related to a given discipline and the individual research plan of a doctoral student at the doctoral school.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	Vocabulary relating to the methodology of scientific research and general issues related to the represented field of science in Spanish	SD_W01	classroom observation
Skills – PhD student can:			
U1	Use Spanish to a degree that enables participation in an international scientific and professional environment, in particular in connection with participation in conferences, seminars, workshops, etc. in the country and abroad - establish contacts to exchange experiences and communicate on specialized topics at the B2 level of the European Common Reference System for Language Education, with specialists in their scientific and professional discipline, as well as with people from outside these circles	SD_U04	classroom observation, test, evaluation of the article abstract
U2	The doctoral student is able to: - communicate in Spanish in familiar everyday and professional situations (with patients, their families and medical staff) at the A2 level of the Common European Framework of Reference for Languages - understand simple text and find necessary information - create simple texts on familiar topics	SD_U17	classroom observation, test
Social competences – PhD student is ready to:			
K1	critical assessment of scientific achievements and expert activity within the scientific discipline in which the doctoral dissertation is prepared	SD_K01	evaluation of the article abstract

Calculation of ECTS points

Semester 5

Activity form	Activity hours*
foreign language course	15
preparation for classes	15

PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 6

Activity form	Activity hours*
foreign language course	15
preparation for classes	15

PhD student workload	Hours 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Semester 1 Linguistic resources needed to present a summary of the article. Basic academic vocabulary. Scientific research vocabulary. Topics selected for summary by doctoral students of the doctoral school.	W1, U1, K1	foreign language course
2.	Semester 2 Vocabulary needed when participating in conferences. Topics selected for summary by doctoral students of the doctoral school.	W1, U1, U2, K1	foreign language course

Course advanced

Semester 5

Teaching methods :

foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, test	Pass with grade. Passing both semester tests. Assessment of activity during classes by the instructor. Assessment of the quality of the prepared summary. Attendance. Any absence must be justified. Excused absences may be due to illness or academic obligations.

Semester 6

Teaching methods :

foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, test, evaluation of the article abstract	Pass with grade. Passing both semester tests. Assessment of activity during classes by the instructor. Assessment of the quality of the prepared summary. Attendance. Any absence must be justified. Excused absences may be due to illness or academic obligations.

Linking with research conducted at the university

German language
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** german
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0231 Language acquisition	**Examination** - graded credit

Period Semester 5	Examination - **Activities and hours** foreign language course: 15	Number of ECTS points 0.0

Period Semester 6	Examination graded credit **Activities and hours** foreign language course: 15	Number of ECTS points 2.0

Goals

C1	The aim of the course is to prepare the PhD students to communicate in German in familiar everyday and professional situations at the level of proficiency A2 of the Common European Framework of Reference for Languages as well as to understand the main points of professional texts within their own field.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The PhD student knows and understands German terminology related to familiar everyday and professional situations	SD_W01	classroom observation, oral answer
Skills – PhD student can:			
U1	The PhD student can: - communicate in German in familiar everyday and professional situations (with patients, their family and medical staff) at the level of proficiency A2 of the Common European Framework of Reference for Languages - understand a simple text and find the required information - produce simple texts on familiar subjects of interest	SD_U17	classroom observation, oral answer
Social competences – PhD student is ready to:			
K1	PhD student is ready to: - identify their professional competence and their own deficits, limitations and learning needs - seek expert advice if they have difficulties in solving the problem themselves - use objective sources of information	SD_K02	classroom observation

Calculation of ECTS points

Semester 5

Activity form	Activity hours*
foreign language course	15
preparation for classes	15
PhD student workload	**Hours** 30

* hour means 45 minutes

Semester 6

Activity form	Activity hours*
foreign language course	15
preparation for classes	15
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities

No.	Course content	Subject's learning outcomes	Activities
1.	Program content	W1, U1, K1	foreign language course
	semester 5		
	specialized language:		
	- hospital and its structure and organization, medical staff and their work		
	- patients and their health problems		
	- internal organs: excretory system and patients' health problems		
	- history taking form		
	- DNAR form (Patientenverfügung)		
	- medical terminology		
	grammar:		
	- present tense, irregular verbs, modal verbs, reflexive verbs, separable verbs		
	- static and dynamic verbs, prepositions with dative and accusative		
	- the structure of a complex sentence, conjunctions causing inversion		
	- word formation: compound nouns		
	general language:		
	- communicating with colleagues, the patient and the patient's relatives		
	academic language:		
	- reading and understanding simple popular science texts		
	- finding information in the text		
	After completing the course, the doctoral student can:		
	1. Speaking		
	in terms of everyday life:		
	- engage in a short conversation, ask simple questions, answer yes or no		
	- talk briefly about daily activities and ask questions about someone else's daily life		
	- use the present tense correctly		
	- correctly build a complex sentence		
	in the field of specialized language:		
	- communicate at a basic level in German on professional topics		
	- take a patient history		
	- describe the excretory system		
	- describe basic health problems		
	- ask simple questions and give simple answers		
	in the field of academic language:		
	- make self-presentation, understand simple information about meetings, dates, etc.		
	- comment on well-known, simple topics related to your field of study or work		
	2. Listening		
	in terms of everyday life:		
	- understand simple conversations delivered slowly		
	in the field of specialized language:		
	- understand simple statements of the patient related to symptoms		
	- understand essential information from short, recorded passages		
	in the field of academic language:		
	- understand and follow simple instructions from the teacher		
	3. Writing		
	in terms of everyday life:		
	- complete a simple form		
	in the field of specialized language:		
	- take simple notes		
	- write down basic concepts related to therapy		
	in the field of academic language:		
	- write a short message		
	- write a simple text related to your field of study or profession		
	4. Reading		
	in terms of everyday life:		
	- find information in simple texts such as: brochures, advertisements, prospectuses		
	- select from a range of information the item appropriate to a particular situation		
	in the field of specialized language:		
	- understand simple instructions		
	- understand simple professional texts		
	in the field of academic language:		
	- combine simple information from various sources		
	In terms of social competence:		
	- develop interpersonal skills, ability to cope with stress and be assertive		
	- develop sensitivity to cultural differences		
		W1, U1, K1	foreign language course

No.	Course content	Subject's learning outcomes	Activities
2.	semester 6 specialized language: - control of vital signs - fever and associated symptoms - pain and pain relief - therapeutic agents for COPD - medicines and leaflets, preparation of medicines - diagnostic equipment and actions taken - laboratory tests: urine and stool tests - blood and blood collection grammar: - past perfect tense with the auxiliary verb haben/sein - past tense Präteritum - inflection of a personal pronoun - conditional sentences with the conjunction "wenn" general language: - communicating with colleagues, the patient and the patient's relatives academic language: - reading and understanding simple professional texts - finding information in the text After completing the course, the doctoral student can: 1. Speaking in terms of everyday life: - describe phenomena and report events - ask for directions or clarification - express short opinions at a basic level - give simple advice - use the discussed grammatical structures correctly in the field of specialized language: - ask the patient/interlocutor about basic health problems and give basic instructions related to professional issues - apply learned sentence patterns and structures in a new context and expand the scope of statements in the field of academic language: - provide information based on knowledge from simple professional texts 2. Listening in terms of everyday life: - understand simple conversations delivered slowly in the field of specialized language: - understand the patient's simple oral statements related to symptoms - understand simple instructions related to therapy - understand essential information from short, recorded passages in the field of academic language: - understand and follow simple instructions from the teacher 3. Writing in terms of everyday life: - complete a simple form in the field of specialized language: - write down basic concepts related to therapy - write simple recommendations for therapy in the field of academic language: - write a short message 4. Reading in terms of everyday life: - understand the general meaning of professional texts with a use of dictionary - select from a range of information the item appropriate to a particular situation - organize the arguments for and against in the field of specialized language: - understand simple instructions - understand simple professional texts in the field of academic language: - combine simple information from various sources	W1, U1, K1	foreign language course

Course advanced

Semester 5

Teaching methods :

foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, oral answer	Assessment of activity during classes by the teacher, oral answer. Attendance absence must be justified. Excused absences may be due to illness or academic obligations.

Semester 6

Teaching methods :

foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, oral answer	Pass with grade. Assessment of activity during classes by the teacher, oral answer. Attendance absence must be justified. Excused absences may be due to illness or academic obligations.

Additional info

In all forms of assessing students' progress applies a uniform grading scale (0 - 100%):
The grading scale applies:
0-59 % – fail
60-70 % – sufficient
71-75% - sufficient plus
76-85% – good
86-90 % – good plus
91-100 % – very good

Entry requirements

Knowledge of German at the level of proficiency A1 of the Common European Framework of Reference for Languages.

Linking with research conducted at the university

Not applicable.

French language
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** french
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0231 Language acquisition	**Examination** - graded credit

Period Semester 5	Examination - Activities and hours foreign language course: 15	Number of ECTS points 0.0
Period Semester 6	Examination graded credit Activities and hours foreign language course: 15	Number of ECTS points 2.0

Goals

C1	The aim of the course is to prepare the student to discuss research topics related to their discipline based on professional literature.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	PhD student knows and understands global achievements, including theoretical foundations, general issues and selected specific issues related to the discipline in which the doctoral dissertation is prepared	SD_W01	classroom observation
Skills – PhD student can:			
U1	PhD student can speak a modern foreign language to the degree that enables participation in an international scientific and professional environment, in particular in connection with the involvement in conferences, seminars, workshops, etc., at home and abroad; can establish contacts for the exchange of experience and communicate on specialist topics at the B2 level of the Common European Framework of Reference for Languages, with specialists in his/her scientific and professional discipline, as well as with people from outside these environments	SD_U04	classroom observation, test
U2	The PhD student is able to: - communicate in French in familiar everyday and professional situations (with patients, their families and medical staff) at the A2 level of the Common European Framework of Reference for Languages - understand simple text and find the necessary information - create simple texts on familiar topics	SD_U17	classroom observation, test
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to critically evaluate the scientific achievements and expert activity within the scientific discipline in which the doctoral dissertation is prepared.	SD_K01	classroom observation, essay, test

Calculation of ECTS points

Semester 5

Activity form	Activity hours*
foreign language course	15
preparation for classes	15

PhD student workload	Hours 30

* hour means 45 minutes

Semester 6

Activity form	Activity hours*
foreign language course	15
preparation for classes	15

PhD student workload	Hours 30
Workload involving teacher	Hours 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Basic academic vocabulary. Discussing scientific research. Summarizing scientific articles. Presenting scientific topics selected by PhD students.	W1, U1, K1	foreign language course
2.	Vocabulary for conference presentations. Summarizing scientific topics selected by PhD students.	W1, U1, U2, K1	foreign language course

Course advanced

Semester 5

Teaching methods :

foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, essay, test	regular class attendance receiving passing grades in all midterm tests summary of a scientific article

Semester 6

Teaching methods :

foreign language course

Activities	Examination methods	Credit conditions
foreign language course	classroom observation, essay, test	regular class attendance receiving passing grades in all midterm tests summary of a scientific article

Linking with research conducted at the university

Cognitive neuroscience
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Medical sciences	**Lecture languages** english
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Medical science	**Examination** graded credit
ISCED classification 0912 Medicine	

Period Semester 6	**Examination** graded credit **Activities and hours** seminar: 10 classes: 20	**Number of ECTS points** 2.0

Goals

C1	In terms of knowledge, the student: Students will acquire basic knowledge on the main research problems and research methods applied in cognitive neuroscience as well as their applications in the medical context.
C2	In terms of skills, students will learn to understand and interpret the results of the studies investigating the cognitive and neuronal underpinnings of human behaviour and apply those skills in a medical context.
C3	In terms of social competencies, students will learn to communicate and discuss the research problems related to cognitive neuroscience. They will also learn how to apply the knowledge to foster interaction with patients with cognitive and neurological disadvantages.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	cognitive neuroscience research methodology, including its theoretical foundations and measurement with selected imaging techniques	SD_W01	classroom observation, essay
W2	issues related to the transfer of cognitive neuroscience results to medical practice	SD_W04, SD_W06	classroom observation, essay
W3	principles of the dissemination of the neuroimaging studies results following the open science framework	SD_W06	classroom observation
Skills – PhD student can:			
U1	use her knowledge to analyze and evaluate the results of cognitive neuroscience studies, as well as propose new research projects	SD_U01	classroom observation, essay
U2	present and discuss the results of research in the field of cognitive neuroscience	SD_U02, SD_U07	classroom observation, essay
Social competences – PhD student is ready to:			
K1	recognizing the importance of cognitive neuroscience studies in medical research and professional practice	SD_K08, SD_K09	classroom observation, essay

Calculation of ECTS points

Activity form	Activity hours*
seminar	10
classes	20
preparation for classes	15
independent education	15
PhD student workload	**Hours** 60
Workload involving teacher	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	General overview of the structural and functional organisation of the brain (including neural underpinnings of perception, attention, memory and language) as well as the examples of the research problems investigated with the cognitive neuroscience approach that seems directly applicable in a medical context (e.g. in context of mild cognitive impairment, perceptual disorders, memory disorders, neurodegenerative disorders, psychiatric disorders, consciousness disorders). A full-day seminar (6h) will begin with a presentation of the methods and paradigms used in cognitive neuroscience, then examples of studies using those methods, both in basic science and medical context will be presented.	W1, W2, W3, U1, U2, K1	seminar
2.	Series of workshops dedicated to the presentation of the methods applied in the cognitive neuroscience (full-day workshops (6h each) and demonstrations of the 1. magnetic resonance imaging, 2. electroencephalography, 3. transcranial magnetic stimulation, 4. electrocardiography & galvanic skin responses given by the specialists in a given method). Each workshop will analyse the use of the methods in the context of understanding aetiology and consequences of various medical conditions as well as medical diagnosis.	W1, U1, K1	classes

Course advanced

Teaching methods :

classes / practicals, seminar

Activities	Examination methods	Credit conditions
seminar	essay	Passing is based on the following activities: - activity during classes - written test. To pass, you must obtain >=60% of points
classes	classroom observation	Passing is based on the following activities: - activity during classes - written test. To pass, you must obtain >=60% of points

Entry requirements

Linking with research conducted at the university

The course discusses the studies of cognitive neuroscience. This area of study is broadly represented at the Jagiellonian University. The course will be led by the researchers associated with the Centre for Brain Research.
Shahbakhti, M., Beiramvand, M., Rejer, I., Augustyniak, P., Broniec-Wójcik, A, Wierzchoń, M. & Marozas, V. (2021). Simultaneus Eye Blink Characterization and Elimination from Low-Channel Prefronal EEG Signals Enhances Driver Drowsiness Detection. IEEE Journal of Biomedical and Health Informatics, 10.1109/JBHI.2021.3096984.
Shahbakhti, M., Beiramvand, M., Nazari, M., Broniec-Wójcik, A., Augustyniak, P., Rodrigues, A.S., Wierzchoń, M. & Marozas, V. (2021). VME-DWT: An Efficient Algorithm for Detection and Elimination of Eye Blink from Short Segments of Single EEG Channel. IEEE Transactions on Neural Systems & Rehabilitation Engineering, 29, 408-417, doi: 10.1109/TNSRE.2021.3054733
Hobot, J., Klincewicz, M., Sandberg, K. & Wierzchoń, M. (2021). Causal inferences in repetitive transcranial magnetic

stimulation research: Challenges and perspectives. Frontiers in Human Neuroscience, 14: 574, doi: 10.3389/fnhum.2020.586448

Hobot, J., Koculak, M., Paulewicz, B., Sandberg, K. & Wierzchoń, M. (2020). Transcranial Magnetic Stimulation-induced motor activity influences visual awareness judgments, 14:580712. Frontiers in Neuroscience, 10.3389/fnins.2020.580712

Derda, M., Koculak, M., Windey, B., Gociewicz, K., Wierzchoń, M., Cleeremans, A. & Binder, M. (2019). The role of levels of processing in disentangling the ERP signatures of conscious visual processing. Consciousness and Cognition, 73, doi: 10.1016/j.concog.2019.102767

Łukowska, M., Sznajder, M. & Wierzchoń, M. (2018). Error-related cardiac response as information for visibility judgements, Scientific Reports, 8, 1131, doi: 10.1038/s41598-018-19144-0

Clinical psychology
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Medical sciences	**Lecture languages** polish
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Medical science	**Examination** graded credit
ISCED classification 0912 Medicine	

Period	Examination	Number of
Semester 6	graded credit	**ECTS points** 1.0
	Activities and hours seminar: 10 workshop: 5	

Goals

C1	The introduction to the clinical psychology issues
C2	The introduction to pathogenetic and salutogenetic factors and mechanisms, strategies and methods of their diagnosis.
C3	Training the ability to apply knowledge from clinical psychology to develop a strategy to solve health problems.
C4	Development of one's own professional competences in the context of psychological understanding of the patient's health problems

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	main issues of clinical psychology (diagnosis, interventions) related to the psychology of children and adolescents, the psychology of the somatically and mentally ill and neuropsychological issues	SD_W09	classroom observation, test, written credit
Skills – PhD student can:			
U1	indicate the application of psychology in clinical practice related to the psychology of children and adolescents, the psychology of the somatically and mentally ill, neuropsychological issues, and in scientific research	SD_U13	classroom observation, test, written credit
Social competences – PhD student is ready to:			
K1	taking into account the conceptualization of various areas of clinical psychology in solving cognitive and practical problems	SD_K08	classroom observation, test, written credit

Calculation of ECTS points

Activity form	Activity hours*
seminar	10
workshop	5
preparation for classes	15

PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Clinical psychology as a theoretical and practical discipline.	W1, U1, K1	seminar
2.	Developmental clinical psychology.	W1, U1, K1	seminar, workshop
3.	Neuropsychological diagnosis	W1, U1, K1	seminar, workshop
4.	Psychological clinical diagnosis of patients with mental illness.	W1, U1, K1	seminar, workshop
5.	Psychological clinical diagnosis in somatic illness	W1, U1, K1	seminar, workshop

Course advanced

Teaching methods :

case study, textual analysis, classes / practicals, discussion, educational film, group work, seminar, workshop, lecture, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
seminar	test, written credit	60% of correct answers on the test
workshop	classroom observation	activity of the student during classes

Entry requirements

The Doctoral School sudents interested in the clinical psychology issues

Linking with research conducted at the university

The research on the neuropsychological consequences of neurological illness, paitents with COVID-19 conducted in the Medical Psychology Department

Drug, food interactions, clinical aspects
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Pharmaceutical sciences	**Lecture languages** polish, english
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Pharmaceutical science	**Examination** graded credit
ISCED classification 0916 Pharmacy	

Period Semester 6	Examination graded credit Activities and hours seminar: 10 classes: 5	Number of ECTS points 1.0

Goals

C1	Understanding the problem of drug interactions with food and dietary supplements
C2	awareness of the impact of drug interactions with food on the effectiveness and safety of therapy
C3	transfer of knowledge on the mechanisms of interactions between dietary components and medications

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	The PhD student is familiar with and understands the main developmental trends in scientific disciplines relevant to education within the field of medical sciences and health sciences.	SD_W09	practical test
W2	The PhD student is familiar with and understands the methodology of scientific research, encompassing theoretical foundations and general issues related to the represented field of medical sciences and health sciences, which are the focus of education in the doctoral school..	SD_W01	multiple choice test
Skills – PhD student can:			
U1	The PhD student is capable, based on acquired knowledge, of critically analyzing and evaluating the results of scientific research within the represented field of study, as well as their own contribution to the development of this discipline. They can formulate new solutions to problems within established and modified methodological paradigms. They creatively apply and advance methods, techniques, and research tools appropriate to their studies. Furthermore, they draw conclusions based on the results of scientific research.	SD_U01	practical test
U2	The PhD student is capable, using their acquired knowledge, of critically analyzing and evaluating the results of research, expert activities, and other creative works, and their contribution to the advancement of knowledge.	SD_U12	practical test
U3	The PhD student is able to disseminate or transfer the results of their scientific activity, including in popular forms.	SD_U02	practical test
Social competences – PhD student is ready to:			
K1	The PhD student is prepared to fulfil the social responsibilities of researchers and creators, as well as to initiate actions for the public interest, including appropriately conveying information and opinions about scientific achievements to society. They are committed to engaging in the education of specialists and other activities aimed at the development of a knowledge-based civil society."	SD_K05	practical test

Calculation of ECTS points

Activity form	Activity hours*
seminar	10
classes	5
preparation for examination	5
participation in examination	2
case analysis	5

PhD student workload	Hours 27
Workload involving teacher	Hours 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	The impact of food on the pharmacokinetics and pharmacodynamics of drugs - detailed mechanisms.	W1, W2	seminar
2.	The components of dietary supplements and their interaction with drugs.	W1, W2	seminar
3.	How malnutrition and obesity impact the effectiveness of drugs	W1, W2	seminar
4.	Practical classes related to using electronic databases - searching for information on drug interactions with food.	U1, U2, U3	classes
5.	Solving issues related to drug-food interactions in a clinical aspect.	U1, U2, U3, K1	classes
6.	Interaction between draugs and alcohol.	W1, W2, K1	seminar

Course advanced

Teaching methods :

case study, textual analysis, brainstorm, discussion, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
seminar	multiple choice test	To pass, obtaining a minimum of 60% of the total points is required..
classes	practical test	The correct solution to clinical case studies. A "case study" task consists of two parts: (i) theoretical, which contains information about the drug and a description of the clinical trial along with its results; (ii) practical, which consists of tasks to be performed. Based on the information contained in the theoretical part, the student is required to: Analyze the presented research results, with particular attention to the basic pharmacokinetic parameters (2 points). Identify the mechanism of the observed interaction between the drug and a food component (1 point). Identify possible consequences for the patient resulting from the interaction between the drug and a food component (1 point). Formulate recommendations for the patient regarding drug intake in relation to food (1 point). The student earns points for each correctly completed task, according to the above criteria. The points are added to the total score obtained from the test, and in order for this task to be passed, the total number of points must not be lower than 3.

Additional info

The requirement to pass the entire course is the completion of a case analysis (the total points obtained from this task must

not be lower than 3) and a test, for which the requirement to pass is obtaining a minimum of 60% of the total points. The final grade is calculated based on the sum of points obtained from these two methods of assessment.
60-70% of points – 3.0 71-75% of points – 3.5 76-80% of points – 4.0 81-90% of points – 4.5 91-100% of points – 5.0

Entry requirements

mandatory attendance at seminars and practical classes

Linking with research conducted at the university

1. Wiesner, Agnieszka, Paweł Zagrodzki, and Paweł Paśko. "Do dietary interventions exert clinically important effects on the bioavailability of β-lactam antibiotics? A systematic review with meta-analyses." Journal of Antimicrobial Chemotherapy 79.4 (2024): 722-757.
2. Wiesner, A., Zagrodzki, P., Gawalska, A., & Paśko, P. (2024). Together or apart? Revealing the impact of dietary interventions on bioavailability of quinolones: a systematic review with meta-analyses. Clinical Pharmacokinetics, 1-46.
3. Wiesner, A., Skrońska, M., Gawlik, G., Marcinkowska, M., Zagrodzki, P., & Paśko, P. (2023). Interactions of Antiretroviral Drugs with Food, Beverages, Dietary Supplements, and Alcohol: A Systematic Review and Meta-analyses. AIDS and Behavior, 27(5), 1441-1468.
4. Wiesner, A., Zagrodzki, P., Jamrozik, M., Korchowiec, J., Marcinkowska, M., & Paśko, P. (2023). Chemometrics as a valuable tool for evaluating interactions between antiretroviral drugs and food. British Journal of Clinical Pharmacology.
5. Wiesner, A., Gajewska, D., & Paśko, P. (2021). Levothyroxine Interactions with Food and Dietary Supplements–A Systematic Review. Pharmaceuticals, 14(3), 206.
6. Wiesner, A., Zwolińska-Wcisło, M., & Paśko, P. (2021). Effect of Food and Dosing Regimen on Safety and Efficacy of Proton Pump Inhibitors Therapy—A Literature Review. International Journal of Environmental Research and Public Health, 18(7), 3527.
7. Wiesner, A., Szuta, M., Galanty, A., & Paśko, P. (2021). Optimal Dosing Regimen of Osteoporosis Drugs in Relation to Food Intake as the Key for the Enhancement of the Treatment Effectiveness—A Concise Literature Review. Foods, 10(4), 720.
8. Paśko, P., Rodacki, T., Domagała-Rodacka, R., Palimonka, K., Marcinkowska, M., & Owczarek, D. (2017). Second generation H1-antihistamines interaction with food and alcohol—A systematic review. Biomedicine & Pharmacotherapy, 93, 27-39

Bioinformatics databases in pharmaceutical sciences
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Pharmaceutical sciences	**Lecture languages** polish
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Pharmaceutical science	**Examination** graded credit
ISCED classification 0916 Pharmacy	

Period Semester 6	Examination graded credit **Activities and hours** seminar: 3 classes: 12	Number of ECTS points 1.0

Goals

C1	Providing knowledge about online resources of bioinformatics databases and patent databases useful in solving research issues in the field of pharmaceutical sciences.
C2	Teaching doctoral students to use research tools available in bioinformatics and patent databases in order to solve selected issues, adequate to the individual research topics conducted as part of doctorates in the field of pharmaceutical sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	methodology of scientific research using bioinformatics and patent databases, covering theoretical foundations and general issues related to research in the field of medical and health sciences	SD_W02	assignment report, oral credit
Skills – PhD student can:			
U1	using the acquired knowledge, critically analyze and evaluate the results of scientific research using bioinformatics and patent databases and own contribution to the development of the field of medical and health sciences, formulate new solutions to problems; - creatively apply and develop methods, techniques and research tools - draw conclusions based on the results of scientific research	SD_U01	classroom observation, assignment report, oral credit
Social competences – PhD student is ready to:			
K1	conducting research independently, taking into account existing limitations, respecting the principle of public ownership of scientific research results, taking into account the principles of intellectual property protection	SD_K06	classroom observation, assignment report

Calculation of ECTS points

Activity form	Activity hours*
seminar	3
classes	12
preparation of a paper	5
preparation of a report	2
information collection	4
PhD student workload	**Hours** 26
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Introduction (Rules for passing the course, division of topics to be developed for oral examination). Review of bioinformatics databases useful in screening pharmacological activity and designing the structure of a new drug - characterization of the protein target. Computer exercises in the use of selected bioinformatics database tools to characterize the drug's protein target and predict the pharmacological activity of compounds. (3 hours).	W1, U1	classes, seminar
2.	Theoretical models for ADMET screening in silico. Review of bioinformatics databases useful in screening the safety and pharmaceutical profile of a new drug (ADMET in silico screening). Computer exercises in the use of selected bioinformatics databases to predict and analyze the ADMET profile of chemical compounds in drug design. (3 hours)	U1, K1	classes, seminar
3.	Patent databases 1. (3 hours)	K1	classes, seminar
4.	Patent databases 2. (3 hours)	K1	classes, seminar
5.	Oral assessment including: (a) multimedia presentation by each doctoral student on selected bioinformatics or patent databases and the possibilities of their use in various aspects of research in pharmaceutical sciences, compared to the databases presented as part of the implementation of topics 1-4; b) discussion - answers to questions asked by the lecturers and doctoral students; (c) evaluation of the presentation by lecturers and doctoral students in the form of a survey. (3 hours)	U1, K1	seminar

Course advanced

Teaching methods :

computer classes, classes in simulated conditions, demonstration, discussion, project method, situation method, presentation, assignments solving, seminar, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
seminar	oral credit	The final grade for the course will be the arithmetic average of the grade given by teachers and doctoral students for giving a multimedia presentation on a given topic and for the knowledge demonstrated in the discussion. The rating will be calculated based on surveys provided by all evaluators.
classes	classroom observation, assignment report	Mandatory attendance at classes and submission of reports on correctly completed tasks.

Entry requirements

Lack

Linking with research conducted at the university

Selected publications of Teachers:

Prof. dr hab. Jadwiga Handzlik

Podlewska Sabina, Bugno Ryszard, Lacivita Enza, Leopoldo Marcello, Bojarski Andrzej J., Handzlik Jadwiga*, Low Basicity as a Characteristic for Atypical Ligands of Serotonin Receptor 5-HT2. Int. J. Mol. Sci. 2021 : Vol. 22, nr 3, id. art. 1035.
IF: 5.924; Punktacja MNiSW: 140.000; DOI: 10.3390/ijms22031035

Kaczor Aneta, Witek Karolina, Podlewska Sabina, Veronique Sinou Veronique, Czekajewska Joanna, Żesławska Ewa, Doroz-Płonka Agata, Lubelska Annamaria, Latacz Gniewomir, Nitek Wojciech, Bischoff Markus, Alibert Sandrine, Pages Jean-Marie, Jacob Claus, Karczewska Elżbieta, Bolla Jean-Michel, Handzlik Jadwiga*. Molecular Insights into an Antibiotic Enhancer Action of New Morpholine-Containing 5-Arylideneimidazolones in the Fight against MDR Bacteria. Int. J. Mol. Sci. 2021: Vol. 22, nr 4, id. art. 2062.
IF: 5.924; Punktacja MNiSW: 140.000; DOI: 10.3390/ijms22042062

Sudoł Sylwia, Cios Agnieszka, Jastrzębska-Więsek Magdalena, Honkisz-Orzechowska Ewelina, Mordyl Barbara, Wilczyńska-Zawal Natalia, Sałata Grzegorz, Kucwaj-Brysz Katarzyna, Partyka Anna, Latacz Gniewomir, Olejarz-Maciej Agnieszka, Wesołowska Anna, Handzlik Jadwiga*.The phenoxyalkyltriazine antagonists for 5-HT6 receptor with promising procognitive and pharmacokinetic properties in vivo in search for a novel therapeutic approach to dementia diseases. Int. J. Mol. Sci. 2021 : Vol. 22, nr 19, id. art. 10773. IF: 5.924; Punktacja MNiSW: 140.000; DOI: 10.3390/ijms221910773

Sudoł Sylwia, Kucwaj-Brysz Katarzyna, Kurczab Rafał, Wilczyńska Natalia, Jastrzębska-Więsek Magdalena, Satała Grzegorz, Latacz Gniewomir, Głuch-Lutwin Monika, Mordyl Barbara, Żesławska Ewa, Nitek Wojciech, Partyka Anna, Buzun Kamila, Doroz-Płonka Agata, Wesołowska Anna, Bielawska Anna, Handzlik Jadwiga*.Chlorine substituents and linker topology as factors of 5-HT6R activity for novel highly active 1,3,5-triazine derivatives with procognitive properties in vivo. Eur. J. Med. Chem. 2020 : Vol. 203, id. art. 112529, IF: 6.514; Punktacja MNiSW: 140.000; DOI: 10.1016/j.ejmech.2020.112529

Ali Wesam, Spengler Gabriella, Kincses Annamaria, Nove Marta, Battistelli Cecilia, Latacz Gniewomir, Starek Małgorzata, Dąbrowska Monika, Honkisz-Orzechowska Ewelina, Romanelli Annalisa, Rasile Manuela Monica, Szymańska Ewa, Jacob Claus, Zwergel Clemens, Handzlik Jadwiga*. Discovery of phenylselenoether-hydantoin hybrids as ABCB1 efflux pump modulating agents with cytotoxic and antiproliferative actions in resistant T-lymphoma. Eur. J. Med. Chem. 2020 : Vol. 200, id. art. 112435, IF: 6.514; Punktacja MNiSW: 140.000; DOI: 10.1016/j.ejmech.2020.112435

Dr hab. Dorota Łażewska:

Łażewska Dorota*, Zaręba Paula, Godyń Justyna, Doroz-Płonka Agata, Frank Annika, Reiner-Link David, Bajda Marek, Stary Dorota, Mogilski Szczepan, Olejarz-Maciej Agnieszka, Kaleta Maria, Stark Holger, Malawska Barbara, Kieć-Kononowicz Katarzyna. Biphenylalkoxyamine Derivatives - Histamine H3 Receptor Ligands with Butyrylcholinesterase Inhibitory Activity. Molecules 2021 : Vol. 26, nr 12, id. art. 3580, IF: 4.411; Punktacja MNiSW: 100.000, DOI: 10.3390/molecules26123580

Łażewska Dorota*, Olejarz-Maciej Agnieszka, Reiner David, Kaleta Maria, Latacz Gniewomir, Zygmunt Małgorzata, Doroz-Płonka Agata, Karcz Tadeusz, Frank Annika, Stark Holger, Kieć-Kononowicz Katarzyna. Dual Target Ligands with 4-tert-Butylphenoxy Scaffold as Histamine H3 Receptor Antagonists and Monoamine Oxidase B Inhibitors. International Journal of Molecular Sciences 2020 : Vol. 21, nr 10, id. art. 3411, IF: 5.924; Punktacja MNiSW: 140.000, DOI: 10.3390/ijms21103411.

Łażewska Dorota*, Bajda Marek, Kaleta Maria, Zaręba Paula, Doroz-Płonka Agata, Siwek Agata, Alachkar Alaa, Mogilski Szczepan, Saad Ali, Kuder Kamil, Olejarz-Maciej Agnieszka, Godyń Justyna, Stary Dorota, Sudoł Sylwia, Więcek Małgorzata, Latacz Gniewomir, Walczak Maria, Handzlik Jadwiga, Sadek Bassem, Malawska Barbara, Kieć-Kononowicz Katarzyna. Rational design of new multitarget histamine H3 receptor ligands as potential candidates for treatment of Alzheimer's disease. European Journal of Medicinal Chemistry 2020 : Vol. 207, id. art. 112743, IF: 6.514, Punktacja MNiSW: 140.000, DOI: 10.1016/j.ejmech.2020.112743.

Łażewska Dorota*, Mogilski Szczepan, Hagenow Stefanie, Kuder Kamil, Głuch-Lutwin Monika, Siwek Agata, Więcek Małgorzata, Kaleta Maria, Seibel Ulla, Buschauer Armin, Filipek Barbara, Stark Holger, Kieć-Kononowicz Katarzyna. Alkyl derivatives of 1,3,5-triazine as histamine H4 receptor ligands. Bioorganic & Medicinal Chemistry 2019 : Vol. 27, nr 7, s. 1254-1262, IF: 3.073; Punktacja MNiSW: 70.000; DOI: 10.1016/j.bmc.2019.02.020

Łażewska Dorota*, Kurczab Rafał, Więcek Małgorzata, Satała Grzegorz, Kieć-Kononowicz Katarzyna, Handzlik Jadwiga*. Synthesis and computer-aided analysis of the role of linker for novel ligands of the 5-HT6 serotonin receptor among substituted 1,3,5-triazinylpiperazines.Bioorganic Chemistry 2019 : Vol. 84, s. 319-325.IF: 4.831; Punktacja MNiSW: 100.000, DOI: 10.1016/j.bioorg.2018.11.046

European Health Systems

Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Health sciences	**Lecture languages** polish, english
Mandatory elective	**Block** obligatory for passing in the course of studies
Disciplines Health science	**Examination** graded credit
ISCED classification 0917 Traditional and complementary medicine and therapy	

Period Semester 6	Examination graded credit **Activities and hours** e-learning seminar: 5 e-learning classes: 10	Number of ECTS points 1.0

Goals

C1	Provide knowledge of the functioning of selected health systems in a comparative perspective.
C2	Identification of reform trends in health care systems in EU countries, impact of EU policies on health reforms.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	principles of organization and financing in European health systems as well as the course of the reform process	SD_W08	classroom observation, group assessment, oral answer

Code	Outcomes in terms of	Effects	Examination methods
Skills – PhD student can:			
U1	compare European health systems and classify them accordingly	SD_U07, SD_U12, SD_U14	classroom observation, group assessment, oral answer
Social competences – PhD student is ready to:			
K1	to take into account solutions proposed by other disciplines and fields of knowledge as part of their research	SD_K08	classroom observation, group assessment, oral answer

Calculation of ECTS points

Activity form	Activity hours*
e-learning seminar	5
e-learning classes	10
preparation for classes	5
preparation for examination	10
PhD student workload	**Hours** 30
Workload involving teacher	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Concept of system and features of the systems approach. System and model: descriptive and normative perspectives. Traditional and contemporary typologies of health systems with examples of selected European systems.	W1, K1	e-learning seminar, e-learning classes
2.	Features of selected health systems in comparative terms (organisation, financing, reforms, EU impact, accessibility to services, resources).	W1, U1, K1	e-learning seminar, e-learning classes
3.	Organisational, financial, political and social determinants of selected health systems a) The political and health system in Germany b) The political and health system in the UK c) The political and health system in the USA d) The political and health system in France e) The political and health system in the Netherlands f) The political and health systems in the Scandinavian countries.	W1, U1, K1	e-learning seminar, e-learning classes

Course advanced

Teaching methods :

case study, discussion, group work, seminar, lecture

Activities	Examination methods	Credit conditions
e-learning seminar	classroom observation, oral answer	the requirement to pass the course is to give a presentation on the assigned topic, according to the guidelines formulated at the beginning of the class.
e-learning classes	classroom observation, group assessment, oral answer	participation in group work and discussion on a given topic

Linking with research conducted at the university

Research conducted within the Health System Policy Network and European Observatory on Health Systems and Policies, cooperation with EuroWHO and the European Commission. Collaboration with PHSSR (Partnership for Sustainability and Resilience in Health Systems), research on sustainability and resilience matrix of the Polish health system and health system barometer.

Principles of the international cooperation in scientific projects
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 6	**Examination** graded credit **Activities and hours** seminar: 25 workshop: 5	**Number of ECTS points** 2.0

Goals

C1	Gaining knowledge about the acquisition of research projects: their sources of funding and applicable procedures (grant application, application evaluation)

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	The PhD student knows and understands the economic, legal and ethical determinants of research activity and its aspects	SD_W03	classroom observation

Code	Outcomes in terms of	Effects	Examination methods
W2	The PhD student has knowledge of knowledge transfer and commercialization of research results	SD_W04	classroom observation
W3	The PhD student has basic knowledge of the acquisition of research projects: the sources of their funding and the applicable procedures (applying for a grant, evaluating applications	SD_W05	classroom observation
W4	A PhD student knows and understands modern concepts, methods and tools for conducting didactic or training activities	SD_W07	classroom observation
Skills – PhD student can:			
U1	A PhD student is able to prepare an application for funding of a research project	SD_U03	classroom observation
U2	A PhD student is able to use a modern foreign language to the extent that enables participation in the international scientific and professional environment, in particular in connection with participation in conferences, seminars, workshops, etc. in Poland and abroad – establish contacts for the exchange of experience and communicate on specialist topics at the B2 level of the Common European Framework of Reference for Qualifications for Languages, with specialists in their scientific and professional discipline, as well as with people from outside these environments	SD_U04	classroom observation
U3	A PhD student is able to plan and implement an individual and team research or creative project, also in an international environment	SD_U05	classroom observation
Social competences – PhD student is ready to:			
K1	The doctoral student is ready to recognize the importance of knowledge from other disciplines and fields of knowledge (other than the one in which the doctoral project is carried out) in solving cognitive and practical problems	SD_K08	classroom observation

Calculation of ECTS points

Activity form	Activity hours*
seminar	25
workshop	5
independent education	30

PhD student workload	**Hours** 60
Workload involving teacher	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	A general approach to international cooperation in scientific projects.	W1, W2, W3, W4, K1	workshop
2.	Definition of the European Qualifications Framework (EQF).	W1, W2, W3, W4	seminar
3.	Financing science - where to apply for grants? International institutions financing scientific projects, policies, entities	W1, W2, W3, W4	workshop
4.	Terms and definitions used in international grant applications: applicant, coordinator, coordinating organisation, beneficiary, associated members, consortium partner.	W1, W2, W3, W4	workshop
5.	Preparation of the grant application: objectives of the programme, structure of the programme.	W4, U1, U2, U3, K1	seminar, workshop
6.	Matters related to the construction of the budget, legal representation of the consortium.	W4, K1	workshop
7.	Project lifecycle management: methodologies, approaches.	W1, W2, W3, W4, U1, U2, U3, K1	seminar, workshop
8.	Protocol modifications: what requires formal approval and what requires notification	W4, U1, K1	seminar, workshop
9.	Grant performance reporting, grant audit	W1, W2, W3, W4, U1, K1	seminar, workshop

Course advanced

Teaching methods :

case study, brainstorm, presentation, seminar

Activities	Examination methods	Credit conditions
seminar	classroom observation	final test, 20 questions (20 points), more than 60% of passing points
workshop	classroom observation	final test, 20 questions (20 points), more than 60% of passing points

Linking with research conducted at the university

1. Matejko B, Gawrecki A, Wróbel M, Hohendorff J, Benbenek-Klupa T, Zozulińska-Ziółkiewicz D, Malecki MT, Klupa T. Physiological Characteristics of Type 1 Diabetes Patients during High Mountain Trekking. J Diabetes Res. 2020 Sep 15;2020:8068710. doi: 10.1155/2020/8068710. eCollection 2020.
2. Lason I, Cyganek K, Witek P, Matejko B, Malecki MT, Skupien J. Continuous glucose monitoring and insulin pump therapy in pregnant women with type 1 diabetes mellitus. Ginekol Pol. 2021;92(10):675-681. doi: 10.5603/GP.a2021.0029. Epub 2021 Apr 29.

Academic entrepreneurship
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** polish
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 6	**Examination** graded credit **Activities and hours** lecture: 6 seminar: 4	**Number of ECTS points** 1.0

Goals

C1	To familiarise doctoral students with issues related to setting up a startups, launching new products and services on the market, in particular products and services based on the results of scientific activity. Financing of sturtups, preparation for presentation to equity investors
C2	Learning practical tools and methods e.g. Business Model Canvas, Porter's 5 Forces Analysis, Marketing Mix, Design Thinking, useful in the commercialization process, including start-up setting and when preparing grant applications.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	issues related to knowledge transfer and commercialization of research results, including the setting up and financing of start-ups	SD_W04, SD_W06	project, credit, 1. Observation of activity in class, including creativity and ability to use existing and accumulated knowledge. 2. Evaluation of the quality of the prepared presentation, including group and individual discussion.
Skills – PhD student can:			
U1	assess the commercialisation potential of scientific results and prepare for discussions with a business partner, including investors	SD_U02, SD_U08, SD_U10	project, credit, 1. Observation of activity in class, including creativity and ability to use existing and accumulated knowledge. 2. Evaluation of the quality of the prepared presentation, including group and individual discussion.
Social competences – PhD student is ready to:			
K1	entrepreneurial thinking and acting, creating new ideas and innovative solutions, commercialization of research results	SD_K06	project, credit, 1. Observation of activity in class, including creativity and ability to use existing and accumulated knowledge. 2. Evaluation of the quality of the prepared presentation, including group and individual discussion.

Calculation of ECTS points

Activity form	Activity hours*
lecture	6
seminar	4
case analysis	5
preparation of multimedia presentation	10
consultations with lecturer	5
PhD student workload	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Basic business forms in Poland, including basic legal and financial aspects.	W1, U1, K1	lecture, seminar
2.	An overview of creative tools for developing new products and services, e.g. Design Thinking.	W1, U1, K1	lecture, seminar
3.	Business Model Canvas	W1, U1, K1	lecture, seminar
4.	Key issues to bear in mind when setting up a business based on intellectual property, particularly based on the results of research results.	W1, U1, K1	lecture, seminar
5.	Preparation of a presentation for an equity or industry investor (pitch-deck)	W1, U1, K1	lecture, seminar
6.	Sources of business / start-up funding, including innovative activities	W1, U1, K1	lecture, seminar

Course advanced

Teaching methods :

case study, classes / practicals, discussion, problem solving method, project method, group work, workshop, lecture with multimedia presentation

Activities	Examination methods	Credit conditions
lecture	project, credit, 1. Observation of activity in class, including creativity and ability to use existing and accumulated knowledge. 2. Evaluation of the quality of the prepared presentation, including group and individual discussion.	Completion of tasks during the course. Preparation of presentations to the investor. Development of the BMC.
seminar	project, credit, 1. Observation of activity in class, including creativity and ability to use existing and accumulated knowledge. 2. Evaluation of the quality of the prepared presentation, including group and individual discussion.	Completion of tasks during the course. Preparation of presentations to the investor. Development of the BMC.

Entry requirements

english B2; ability to search databases, information-seeking skills, ability to think analytically and to draw conclusions

Linking with research conducted at the university

N/A

Artificial intelligence in medical sciences
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 6	Examination graded credit Activities and hours seminar: 10	Number of ECTS points 1.0

Goals

C1	To familiarize PhD students with the elements of empirical modeling implemented using artificial intelligence tools.
C2	Familiarizing PhD students with the principles of AI tools: artificial neural networks, decision trees and rule systems, evolutionary computations

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	research methodology using artificial intelligence in general for the field of medical and health sciences and in detail in the discipline in which the doctoral thesis is being prepared	SD_W01, SD_W02	test
Skills – PhD student can:			
U1	based on data analyzes using artificial intelligence tools, can creatively apply acquired knowledge to solve scientific problems	SD_U01	classroom observation
Social competences – PhD student is ready to:			
K1	use of artificial intelligence tools, can identify the need for formulating new research paradigms within the field of knowledge to which the discipline in which the doctoral project is carried out belongs	SD_K04	test

Calculation of ECTS points

Activity form	Activity hours*
seminar	10
preparation for examination	5
independent education	15

PhD student workload	Hours 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Definition and applications of empirical modeling	W1, U1	seminar
2.	Basic heuristic tools in empirical modeling: artificial neural networks, decision trees, rule systems, evolutionary computations	W1, U1, K1	seminar
3.	R and Python environments	U1, K1	seminar

Course advanced

Teaching methods :

presentation, seminar, workshop

Activities	Examination methods	Credit conditions
seminar	classroom observation, test	Grades (minimal points): 5.0 (95%), 4.5 (85%), 4.0 (75%), 3.5 (65%), 3.0 (50%)

Entry requirements

Linking with research conducted at the university

Czub Natalia, Szlęk Jakub, Pacławski Adam, Klimończyk Klaudia, Puccetti Matteo, Mendyk Aleksander: Artificial intelligence-based quantitative structure-property relationship model for predicting human intestinal absorption of compounds with serotonergic activity, Molecular Pharmaceutics, American Chemical Society, vol. 20, nr 5, 2023, s. 2545-2555, DOI:10.1021/acs.molpharmaceut.2c01117, 140 p., IF(4,9)

Gawalska Alicja, Czub Natalia, Sapa Michał, Kołaczkowski Marcin, Bucki Adam, Mendyk Aleksander: Application of automated machine learning in the identification of multi-target-directed ligands blocking PDE4B, PDE8A, and TRPA1 with potential use in the treatment of asthma and COPD, Molecular Informatics, vol. 42, nr 7, 2023, Numer artykułu: 2200214, DOI:10.1002/minf.202200214, 70 p., IF(3,6)

Czub Natalia, Pacławski Adam, Szlęk Jakub, Mendyk Aleksander: Do AutoML-based QSAR models fulfill OECD principles for regulatory assessment? A 5-HT1A receptor case, Pharmaceutics, MDPI, vol. 14, nr 7, 2022, Numer artykułu: 1415, DOI:10.3390/pharmaceutics14071415, 100 p. IF(5,4)

New medical technologies and philosophy
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Mandatory elective	**Lecture languages** polish, english
Disciplines Medical science, Pharmaceutical science, Health science	**Block** obligatory for passing in the course of studies
ISCED classification 0917 Traditional and complementary medicine and therapy	**Examination** graded credit

Period Semester 6	Examination graded credit Activities and hours lecture: 2 seminar: 8	Number of ECTS points 1.0

Goals

C1	The aim of the faculty is to familiarize doctoral students with philosophical and ethical issues related to new technologies in medicine. During the classes, PhD students become familiar with various definitions and theories of technology. The classes are intended to show that each technology imposes a certain image of the world and embodies specific values.
C2	The aim of the course is to familiarize doctoral students with research methodology in the humanities and social sciences (philosophy, cultural anthropology, empirical bioethics).

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			

Code	Outcomes in terms of	Effects	Examination methods
W1	ethical standards for research activities and their philosophical background	SD_W01, SD_W02, SD_W03	essay
W2	selected questions in methodology of the humanities and social sciences, as well as the methodological differences between the humanities, social sciences and medical and health sciences	SD_W01, SD_W03, SD_W08	essay
Skills – PhD student can:			
U1	participate in scientific discourse relating to the ethical aspects of the development and implementation of new medical technologies	SD_U01, SD_U02, SD_U03, SD_U05, SD_U06, SD_U07, SD_U08, SD_U09, SD_U11, SD_U12	essay
U2	take into account ethical considerations in planning and implementing research or creative projects	SD_U05, SD_U07, SD_U08, SD_U10	essay
U3	define the purpose and subject of research in the humanities (philosophy and ethics) and social sciences (medical anthropology), formulate a research hypothesis, develop methods, techniques and research tools in the field of humanities and social sciences and apply them creatively draw conclusions based on research results	SD_U01, SD_U11, SD_U12, SD_U13, SD_U14	essay
Social competences – PhD student is ready to:			
K1	determining the role of methodological paradigms of their discipline and their limitations in solving social problems	SD_K01, SD_K03, SD_K04, SD_K05, SD_K06, SD_K09	essay
K2	thinking and acting in an entrepreneurial way, creating new ideas and searching - in cooperation with people representing other disciplines: humanities (philosophy, ethics) and social sciences (medical anthropology) - innovative solutions, taking up challenges/intellectual risks in the scientific/professional sphere and public and be responsible for the consequences of their decisions	SD_K05, SD_K06, SD_K07, SD_K08, SD_K09	essay

Calculation of ECTS points

Activity form	Activity hours*
lecture	2
seminar	8
preparation of a project	20
PhD student workload	**Hours** 30

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	What is technology? The concept of technological progress, the relationship between science and technology, technology and culture and nature.	U1, U2, U3, K1, K2	lecture, seminar
2.	Philosophy, cultural anthropology - a review of research methods.	W1, W2, U1, U2, U3, K1, K2	seminar
3.	How does medicine create its subject matter?	W2, U1, U2, U3, K1, K2	lecture, seminar
4.	Information technologies in medicine and their impact on scientific research, medical practice and patient's life	W1, W2, U1, U2, U3, K1, K2	lecture, seminar
5.	Artificial intelligence in healthcare	W1, U1, U2, U3, K1, K2	seminar
6.	New technologies in the care of chronically ill patients: analysis of the patient experience.	W1, U1, U2, U3, K1, K2	seminar
7.	Genetic engineering: fundamental ethical and political problems?	W1, U1, U2, U3, K1, K2	lecture, seminar
8.	Reproductive cloning: philosophical and ethical aspects.	U1, U2, U3, K1, K2	seminar
9.	Artificial uterus – do we really want it? Philosophical and ethical problems related to the technologization of procreation.	W1, U1, U2, U3, K1, K2	lecture, seminar
10.	Enhancement: The case of cosmetic psychiatry and neuroscience.	W1, U1, U2, U3, K1, K2	seminar

Course advanced

Teaching methods :

case study, textual analysis, brainstorm, classes / practicals, discussion, educational film, problem solving method, group work, seminar, lecture

Activities	Examination methods	Credit conditions
lecture	essay	activity in classes
seminar	essay	The doctoral student prepares a protocol for research (conceptual or empirical) of a selected problem related to the subject of the course

Linking with research conducted at the university

Piasecki, J. and Cheah, P.Y., 2022. Ownership of individual-level health data, data sharing, and data governance. BMC Medical Ethics, 23(1), pp.1-9.
Piasecki, J., Walkiewicz-Żarek, E., Figas-Skrzypulec, J. et al. Ethical issues in biomedical research using electronic health records: a systematic review. Med Health Care and Philos 24, 633–658 (2021). https://doi.org/10.1007/s11019-021-10031-6
Piasecki J, Dranseika V. Balancing professional obligations and risks to providers in learning healthcare systems. Journal of Medical Ethics 2021;47:413-416.
Piasecki, J. (2013). Etyka a klonowanie człowieka. w: Bioetyka, J. Różyńka, W. Chańska red.

Research internship in health sciences
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Health sciences	**Lecture languages** polish, english
Mandatory obligatory	**Block** obligatory for passing a year
Disciplines Health science	**Examination** credit
ISCED classification 0919 Health not elsewhere classified	

Period Semester 6	Examination credit Activities and hours training: 60	Number of ECTS points 3.0

Goals

C1	Familiarization of the PhD with broad-based research activities in the disciplines of health sciences.
C2	Establishing scientific contacts with leading research centers in the field of health sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	the scope and methodologies of research conducted in the selected research internship center.	SD_W01, SD_W02, SD_W09	credit
Skills – PhD student can:			

Code	Outcomes in terms of	Effects	Examination methods
U1	Using their knowledge, they can critically analyze their research.	SD_U01, SD_U05, SD_U08, SD_U14	credit
U2	participate in a scientific discussion.	SD_U07	credit
Social competences – PhD student is ready to:			
K1	critical assessment of one's own contribution to the development of the discipline of health sciences against the background of the achievements of the center where the research fellowship is carried out.	SD_K01, SD_K02	credit
K2	creating new ideas and inter-centre cooperation while respecting the ethos of the research community.	SD_K06, SD_K07	credit

Calculation of ECTS points

Activity form	Activity hours*
training	60
independent education	30

PhD student workload	**Hours** 90
Workload involving teacher	**Hours** 60

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	The suggested activities of a doctoral student depend on the choice of the center where he/she completes the research internship.	W1, U1, U2, K1, K2	training

Course advanced

Teaching methods :

demonstration, discussion, presentation, group work, participation in research

Activities	Examination methods	Credit conditions
training	credit	participating in at least a 2-week research internship at a research center confirmed by an appropriate document

Additional info

1. The PhD student submits a completed form (Annex 1) to the Doctoral School, indicating the location and duration of the internship, as well as a brief report of the PhD student's activities and/or skills acquired and/or publications resulting from

the research internship.

2. The form must be signed by the PhD student, the supervisor(s) and the auxiliary supervisor (if appointed).

3. The PhD student shall attach to the form a confirmation of the internship signed by the internship supervisor and copies of the scientific publications resulting from the internship.

4. The form is subject to the approval of the Doctoral Programme Coordinator and is kept in the PhD student's file at the Doctoral School.

Entry requirements

1.   The PhD student must complete a minimum of two weeks of research internship in a foreign centre chosen by the supervisor and the PhD student.

2.   If it is not reasonably possible to complete a research internship in a foreign research unit, it may be completed in a domestic unit under the following conditions:

a.   The domestic unit is recognised as a leading centre in the international research community (centre of excellence, reference centre title awarded by international institutions or scientific societies).

b.   The unit is not the same as the unit (organisational unit) in which the PhD students carry out their research.

c.   The PhD student must provide a written justification for not being able to do the internship in a foreign unit and a copy of a document confirming the international recognition of the domestic centre.

d.   The recognition of the internship in a domestic unit as equivalent to the internship in a foreign unit will be decided by the Doctoral Programme Coordinator.

Linking with research conducted at the university

not applicable

Research internship in medical sciences
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Medical sciences	**Lecture languages** polish, english
Mandatory obligatory	**Block** obligatory for passing a year
Disciplines Medical science	**Examination** credit
ISCED classification 0912 Medicine	

Period	Examination	Number of ECTS points
Semester 6	credit **Activities and hours** training: 60	3.0

Goals

C1	Familiarization of the PhD with broad-based research activities in the disciplines of medical sciences.
C2	Establishing scientific contacts with leading research centers in the field of medical sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	the scope and methodologies of research conducted in the selected research internship center.	SD_W01, SD_W02, SD_W09	credit
Skills – PhD student can:			

Code	Outcomes in terms of	Effects	Examination methods
U1	Using their knowledge, they can critically analyze their research.	SD_U01, SD_U05, SD_U08, SD_U14	credit
U2	participate in a scientific discussion.	SD_U07	credit
Social competences – PhD student is ready to:			
K1	critical assessment of one's own contribution to the development of the discipline of medical sciences against the background of the achievements of the center where the research fellowship is carried out.	SD_K01, SD_K02	credit
K2	creating new ideas and inter-centre cooperation while respecting the ethos of the research community.	SD_K06, SD_K07	credit

Calculation of ECTS points

Activity form	Activity hours*
training	60
independent education	30
PhD student workload	**Hours** 90
Workload involving teacher	**Hours** 60

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	The suggested activities of a doctoral student depend on the choice of the center where he/she completes the research internship.	W1, U1, U2, K1, K2	training

Course advanced

Teaching methods :

demonstration, discussion, presentation, group work, participation in research

Activities	Examination methods	Credit conditions
training	credit	participating in at least a 2-week research internship at a research center confirmed by an appropriate document

Additional info

1. The PhD student submits a completed form (Annex 1) to the Doctoral School, indicating the location and duration of the internship, as well as a brief report of the PhD student's activities and/or skills acquired and/or publications resulting from

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the research internship.

2. The form must be signed by the PhD student, the supervisor(s) and the auxiliary supervisor (if appointed).

3. The PhD student shall attach to the form a confirmation of the internship signed by the internship supervisor and copies of the scientific publications resulting from the internship.

4. The form is subject to the approval of the Doctoral Programme Coordinator and is kept in the PhD student's file at the Doctoral School.

Entry requirements

1.   The PhD student must complete a minimum of two weeks of research internship in a foreign centre chosen by the supervisor and the PhD student.

2.   If it is not reasonably possible to complete a research internship in a foreign research unit, it may be completed in a domestic unit under the following conditions:

a.   The domestic unit is recognised as a leading centre in the international research community (centre of excellence, reference centre title awarded by international institutions or scientific societies).

b.   The unit is not the same as the unit (organisational unit) in which the PhD students carry out their research.

c.   The PhD student must provide a written justification for not being able to do the internship in a foreign unit and a copy of a document confirming the international recognition of the domestic centre.

d.   The recognition of the internship in a domestic unit as equivalent to the internship in a foreign unit will be decided by the Doctoral Programme Coordinator.

Linking with research conducted at the university

not applicable

Research internship in pharmaceutical sciences
Educational subject description sheet

Basic information

Organizational unit Doctoral School of Medical and Health Sciences	**Didactic cycle** 2025/26
Programme Interdisciplinary program in Medical and Health Sciences	**Realization year** 2027/28
Doctoral programme Pharmaceutical sciences	**Lecture languages** polish, english
Mandatory obligatory	**Block** obligatory for passing a year
Disciplines Pharmaceutical science	**Examination** credit
ISCED classification 0916 Pharmacy	

Period	Examination	Number of
Semester 6	credit **Activities and hours** training: 60	**ECTS points** 3.0

Goals

C1	Familiarization of the PhD with broad-based research activities in the disciplines of pharmaceutical sciences.
C2	Establishing scientific contacts with leading research centers in the field of pharmaceutical sciences.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – PhD student knows and understands:			
W1	the scope and methodologies of research conducted in the selected research internship center.	SD_W01, SD_W02, SD_W09	credit
Skills – PhD student can:			

Code	Outcomes in terms of	Effects	Examination methods
U1	Using their knowledge, they can critically analyze their research.	SD_U01, SD_U05, SD_U08, SD_U14	credit
U2	participate in a scientific discussion.	SD_U07	credit
Social competences – PhD student is ready to:			
K1	critical assessment of one's own contribution to the development of the discipline of pharmaceutical sciences against the background of the achievements of the center where the research fellowship is carried out.	SD_K01, SD_K02	credit
K2	creating new ideas and inter-centre cooperation while respecting the ethos of the research community.	SD_K06, SD_K07	credit

Calculation of ECTS points

Activity form	Activity hours*
training	60
independent education	30

PhD student workload	**Hours** 90
Workload involving teacher	**Hours** 60

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	The suggested activities of a doctoral student depend on the choice of the center where he/she completes the research internship.	W1, U1, U2, K1, K2	training

Course advanced

Teaching methods :

demonstration, discussion, presentation, group work, participation in research

Activities	Examination methods	Credit conditions
training	credit	participating in at least a 2-week research internship at a research center confirmed by an appropriate document

Additional info

1.   The PhD student submits a completed form (Annex 1) to the Doctoral School, indicating the location and duration of

the internship, as well as a brief report of the PhD student's activities and/or skills acquired and/or publications resulting from the research internship.

2.	The form must be signed by the PhD student, the supervisor(s) and the auxiliary supervisor (if appointed).

3.	The PhD student shall attach to the form a confirmation of the internship signed by the internship supervisor and copies of the scientific publications resulting from the internship.

4.	The form is subject to the approval of the Doctoral Programme Coordinator and is kept in the PhD student's file at the Doctoral School.

Entry requirements

1.	The PhD student must complete a minimum of two weeks of research internship in a foreign centre chosen by the supervisor and the PhD student.

2.	If it is not reasonably possible to complete a research internship in a foreign research unit, it may be completed in a domestic unit under the following conditions:

a.	The domestic unit is recognised as a leading centre in the international research community (centre of excellence, reference centre title awarded by international institutions or scientific societies).

b.	The unit is not the same as the unit (organisational unit) in which the PhD students carry out their research.

c.	The PhD student must provide a written justification for not being able to do the internship in a foreign unit and a copy of a document confirming the international recognition of the domestic centre.

d.	The recognition of the internship in a domestic unit as equivalent to the internship in a foreign unit will be decided by the Doctoral Programme Coordinator.

Linking with research conducted at the university

not applicable