Medicine in "OMICS"

Educational subject description sheet

Basic information

Organizational unit Faculty of Medicine	**Didactic cycle** 2024/25
Field of study Medicine, Program in English	**Realization year** 2026/27
Study level long-cycle master's degree program	**Lecture languages** english
Study form full-time	**Block** obligatory for passing in the course of studies
Education profile general academic	**Mandatory** elective
Disciplines Medical science	**Examination** graded credit
ISCED classification 0912 Medicine	**Standard groups** A. MORPHOLOGICAL SCIENCES, B. SCIENTIFIC BASIS OF MEDICINE, C. PRECLINICAL SCIENCES
Subject related to scientific research Tak	
USOS code LE.LEE.JS.3f0730	

Subject coordinator	Monika Piwowar
Lecturer	The full list of lecturers is available on the website usosweb.uj.edu.pl in the tab Directory → Courses.

Periods Semester 5, Semester 6	**Examination** graded credit **Activities and hours** seminar: 15 classes: 15	**Number of ECTS points** 2.0

Entry requirements and additional information

Entry requirements

no requirements

Goals

C1	Acquiring knowledge and skills on issues related to personalized medicine in terms of OMICs.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	functions of the human genome, transcriptome and proteome and the methods used to study them, the processes of DNA replication, repair and recombination, transcription, translation and degradation of DNA, RNA and proteins, as well as the concepts of regulation of gene expression	B.W12	project, assignment report
W2	basic computer and biostatistical tools used in medicine	B.W23	project, assignment report
Skills – Student can:			
U1	use medical databases and properly interpret the information included in them, needed to solve problems in basic and clinical sciences	B.U8	project, assignment report

Calculation of ECTS points

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

Student workload	**Hours** 50
Workload involving teacher	**Hours** 30
Practical workload	**Hours** 15

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Introduction to the course	W1, W2, U1	seminar

No.	Course content	Subject's learning outcomes	Activities
2.	Genomics and transcriptomics	W1, W2, U1	seminar
3.	Metabolomics	W1, W2, U1	seminar
4.	Epigenomics	W1, W2, U1	seminar
5.	Biological networks	W1, W2, U1	seminar
6.	Metabolomics - networks of biomolecules activity in eukaryotic cells.	W1, W2, U1	classes
7.	Genomics of individual differences in the human population (genetic profiles)	W1, W2, U1	classes
8.	Epigenetic mechanisms influencing cellular functions.	W1, W2, U1	classes
9.	Transcriptomics - a tool for analyzing the state of the cell.	W1, W2, U1	classes
10.	Retrieving sequence information for proteins and genes.	W1, W2, U1	classes
11.	Integration of "OMICs" data.	W1, W2, U1	classes
12.	Individual project - 1	W1, W2, U1	classes
13.	Individual project - 2	W1, W2, U1	classes
14.	Presentation of the projects - 1	W1, W2, U1	seminar
15.	Presentation of the projects - 2	W1, W2, U1	seminar

Course advanced

Teaching methods:

computer classes, project method, seminar, workshop

Activities	Examination methods	Credit conditions
seminar	project	Preparing and presenting the project to the group and leading the discussion.
classes	assignment report	Positively completing all practical tasks.

Literature

Obligatory

1. A set of publications will be made available to students gradually during classes.

Rules for using AI tools

The use of AI-based tools by students and instructors is permitted in accordance with the Regulation of the Rector of the Jagiellonian University on the use of artificial intelligence tools in teaching.
Students are obliged to:
• comply with the rules governing the use of AI-based tools as set by the course teacher;
• use AI-based tools consciously and responsibly, taking into account potential risks, ethical and legal considerations, including issues of academic integrity;
• when using AI-based tools in the preparation of coursework or other assignments, clearly indicate the parts of the work

that were generated with the use of AI-based tools (e.g., through appropriate footnotes, comments, or other annotations in the text, including, where applicable, the prompt used).
Persons who use artificial intelligence in a manner inconsistent with these rules—particularly those who fail to disclose the use of AI-based tools or mislead others regarding the authorship of their work—are subject to disciplinary action under separate regulations.
The course coordinator/teacher will present clear rules for the use of AI-based tools during the first class session.
Teachers will apply appropriate methods and forms of assessment and examination that enable proper verification of learning outcomes and students' independent work.

Effects

Code	Content
B.U8	The graduate can use medical databases and properly interpret the information included in them, needed to solve problems in basic and clinical sciences
B.W12	The graduate knows and understands functions of the human genome, transcriptome and proteome and the methods used to study them, the processes of DNA replication, repair and recombination, transcription, translation and degradation of DNA, RNA and proteins, as well as the concepts of regulation of gene expression
B.W23	The graduate knows and understands basic computer and biostatistical tools used in medicine