JAGIELLONIAN UNIVERSITY MEDICAL COLLEGE

# Biostatistics

Educational subject description sheet

## Basic information

| | |
|---|---|
| **Organizational unit**<br>Faculty of Medicine | **Didactic cycle**<br>2024/25 |
| **Field of study**<br>Medicine, Program in English | **Realization year**<br>2026/27 |
| **Study level**<br>long-cycle master's degree program | **Lecture languages**<br>english |
| **Study form**<br>full-time | **Block**<br>obligatory for passing in the course of studies |
| **Education profile**<br>general academic | **Mandatory**<br>elective |
| **Disciplines**<br>Medical science | **Examination**<br>graded credit |
| **ISCED classification**<br>0912 Medicine | **Standard groups**<br>A. MORPHOLOGICAL SCIENCES, B. SCIENTIFIC BASIS OF MEDICINE, C. PRECLINICAL SCIENCES |
| **Subject related to scientific research**<br>Tak | |
| **USOS code**<br>LE.LEE.JS.3f0109 | |

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

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|---|---|---|
| **Periods**<br>Semester 5, Semester 6 | **Examination**<br>graded credit<br><br>**Activities and hours**<br>seminar: 10<br>classes: 20 | **Number of ECTS points**<br>2.0 |

## Entry requirements and additional information

### Entry requirements

no requirements

## Goals

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|---|---|
| C1 | Implementation of a program of classes including theoretical introduction and practical exercises using basic parametric and non-parametric statistical methods for evaluation medical data. |

## Subject's learning outcomes

| Code | Outcomes in terms of | Effects | Examination methods |
|---|---|---|---|
| **Knowledge – Student knows and understands:** | | | |
| W1 | basic methods of statistical analysis used in population and diagnostic studies | B.W24 | project, assignment report |
| W2 | basic computer and biostatistical tools used in medicine | B.W23 | project, assignment report |
| **Skills – Student can:** | | | |
| U1 | select an appropriate statistical test, perform basic statistical analyses and use appropriate methods to present results | B.U9 | project, assignment report |

## Calculation of ECTS points

| Activity form | Activity hours* |
|---|---|
| seminar | 10 |
| classes | 20 |
| preparation for classes | 20 |

| | |
|---|---|
| **Student workload** | **Hours**<br>50 |
| **Workload involving teacher** | **Hours**<br>30 |
| **Practical workload** | **Hours**<br>20 |

* hour means 45 minutes

## Study content

| No. | Course content | Subject's learning outcomes | Activities |
|---|---|---|---|
| 1. | Introduction to statistical software | W2, U1 | classes, seminar |
| 2. | R syntax - 1 | W1, U1 | classes |
| 3. | R syntax - 2 | W1, U1 | classes |
| 4. | Descriptive statistics | W1, U1 | classes, seminar |

| No. | Course content | Subject's learning outcomes | Activities |
|---|---|---|---|
| 5. | Student's t-test, U Mann-Whitney test (Mann-Whitney-Wilcoxon test) | W1, U1 | classes, seminar |
| 6. | ANOVA, Kruskal-Wallis test | W1, U1 | classes, seminar |
| 7. | Pearson and Spearman correlation | W1, U1 | classes, seminar |
| 8. | Linear regression | W1, U1 | classes, seminar |
| 9. | Chi-square and Z- correlation | W1, U1 | classes, seminar |
| 10. | Graphical presentation of the data 1 | W1, W2, U1 | classes |
| 11. | Graphical presentation of the data 2 | W1, W2, U1 | classes |
| 12. | Final Project - 1 | W1, W2, U1 | classes |
| 13. | Final Project - 2 | W1, W2, U1 | classes |
| 14. | Presentation of student's projects - 1 | W1, U1 | seminar |
| 15. | Presentation of student's projects - 2 | W1, U1 | seminar |

## Course advanced

### Teaching methods:

computer classes, computer room, seminar, workshop, practical classes

| Activities | Examination methods | Credit conditions |
|---|---|---|
| seminar | project | During the seminars, the student is obliged to present a previously prepared project by presenting his/her achievements to the group. |
| classes | assignment report | After each class, the student is obliged to send a report with independently completed tasks. |

## Literature

#### Obligatory


1. "Introduction to R" https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf
2. Daniell W., Biostatistics: A Foundation for Analysis in the Heath Science, John Wiley, New York, 2009


## 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.U9 | The graduate can select an appropriate statistical test, perform basic statistical analyses and use appropriate methods to present results |
| B.W23 | The graduate knows and understands basic computer and biostatistical tools used in medicine |
| B.W24 | The graduate knows and understands basic methods of statistical analysis used in population and diagnostic studies |