



Applied Informatics  
Educational subject description sheet

**Basic information**

|   |   |   |  |
|---|---|---|--|
| <b>Field of study</b><br>Food quality management and analysis               |   | <b>Education cycle</b><br>2025/26                               |  |
| <b>Speciality</b><br>-  |   | <b>Subject code</b><br>ND000000NZJS.MI4.0095.25                 |  |
| <b>Organizational unit</b><br>The Faculty of Biotechnology and Food Science |   | <b>Lecture languages</b><br>english                             |  |
| <b>Study level</b><br>Second-cycle (engineer) programme                     |   | <b>Mandatory</b><br>optional                                    |  |
| <b>Study form</b><br>Full-time  |   | <b>Block</b><br>major subjects (conducted) in foreign languages |  |
| <b>Education profile</b><br>General academic                                |   | <b>Disciplines</b>  |  |
|   |   | <b>Subject related to scientific research</b><br>No             |  |
|   |   | <b>Subject shaping practical skills</b><br>Nie                  |  |
| <b>Teacher responsible for the subject</b>                                  | Wojciech Łaba   |   |  |
| <b>Other teachers conducting classes</b>                                    | Wojciech Łaba   |   |  |
| <b>Period</b><br>Semester 3   | <b>Examination</b><br>graded credit                   | <b>Number of ECTS points</b><br>2.0                             |  |
|   | <b>Activities and hours</b><br>laboratory classes: 30 |   |  |

**Goals**

|    |  |
|----|--|
| C1 | The subject of the course is the application of statistical analysis software, in particular the Statistica package, for processing scientific research data |
|----|--|

## Subject's learning outcomes

| Code  | Outcomes in terms of   | Effects     | Examination methods      |
|---|--|-------------|--------------------------|
| <b>Knowledge - Student knows and understands:</b> |  |             |                          |
| W1  | software for analyzing experimental data, in particular the Statistica package                           | NZ_P7S_WG03 | performing tasks         |
| W2  | fundamentals of statistical tests and tools to analyze the results of scientific research                | NZ_P7S_WG03 | performing tasks         |
| <b>Skills - Student can:</b>                      |  |             |                          |
| U1  | properly select and use statistical tests to correctly draw statistical conclusions                      | NZ_P7S_UW04 | report, performing tasks |
| U2  | use the tools included in the Statistica package to plan the experimental layout and to analyze the data | NZ_P7S_UW04 | report, performing tasks |
| U3  | use relevant professional terminology in English   | NZ_P7S_UK07 | report, performing tasks |
| <b>Social competences - Student is ready to:</b>  |  |             |                          |
| K1  | critical assessment of popular and scientific content  | NZ_P7S_KK01 | active participation     |

## Balance of ECTS points

| Activity form                     | Activity hours*    |                    |
|-----------------------------------|--------------------|--------------------|
| laboratory classes                | 30                 |                    |
| class preparation                 | 15                 |                    |
| report preparation                | 15                 |                    |
| <b>Student workload</b>           | <b>Hours</b><br>60 | <b>ECTS</b><br>2.0 |
| <b>Workload involving teacher</b> | <b>Hours</b><br>30 | <b>ECTS</b><br>1.0 |
| <b>Practical workload</b>         | <b>Hours</b><br>45 | <b>ECTS</b><br>1.7 |

\* hour means 45 minutes

## Study content

| No. | Course content   | Activities         |
|-----|--|--------------------|
| 1.  | 1. Overview of the Statistica package, input data organization, descriptive statistics, charts<br>2. Verifying the conditions for using parametric tests, basic statistics<br>3. Development of the results of 1-factor experiments in the Statistica package<br>4. Analysis of variance in the Statistica package, one-way experiments<br>5. Data transformation<br>6. Analysis of variance in the Statistica package, two-factor experiments<br>7. Using the Statistica software to analyze qualitative data (ordinal scale), examples of nonparametric tests,<br>8. Use of the Statistica software for the analysis of qualitative data (nominal scale), multi-division tables<br>9. Correlation and simple linear regression in the Statistica software<br>11. Stepwise regression, non-linear regression<br>10. Multidimensional analyses, principal component analysis<br>12. Application of the Statistica software for planning and analysis of experiments - introduction, simple linear models, bivalent plans, blocks<br>13. Planning of experiments - Plackett-Burman screening design<br>14. Planning of experiments - trivalent plans, Box-Behnken design, central composite design<br>15. Automated Neural Networks in Statistica | laboratory classes |

## Course advanced

### Teaching methods:

computer lab/laboratory, classes

| Activities         | Examination methods                            | Percentage in subject assessment |
|--------------------|--|----------------------------------|
| laboratory classes | active participation, report, performing tasks | 100%                             |

## Entry requirements

information technology, mathematics, mathematical statistics

## Literature

### Obligatory

1. Rabiej M.: Analizy statystyczne z programami Statistica i Excel, wyd. Helion, Gliwice 2018
2. Data Science Textbook, Tibco: <https://docs.tibco.com/data-science/textbook>
3. TIBCO Statistica Quick Reference, Software Release 13.3, June 2017: <https://docs.tibco.com/products/tibco-statistica/archive>

### Optional

1. Stanisz A.: Przystępny kurs statystyki z zastosowaniem Statistica PL na przykładach z medycyny; Tom 1. Statystyki podstawowe, StatSoft, Kraków 2006
2. Stanisz A.: Przystępny kurs statystyki z zastosowaniem Statistica PL na przykładach z medycyny; Tom 2. Modele liniowe i nieliniowe, StatSoft, Kraków 2007

## Kierunkowe efekty uczenia się

| Kod         | Treść  |
|-------------|--|
| NZ_P7S_KK01 | The graduate is ready to critically evaluate information from various sources and seek expert opinions in solving professional problems                                    |
| NZ_P7S_UK07 | The graduate is able to use a foreign language at the B2 + level of the European Framework of Reference for Education using specialist terminology                         |
| NZ_P7S_UW04 | The graduate can apply IT tools and statistical methods in planning experiments and developing research results as well as analyzing enterprise costs                      |
| NZ_P7S_WG03 | The graduate knows and understands the principles of planning and optimizing experiments and developing scientific results using advanced statistical methods and IT tools |