

Practice in Environmental Sciences
Educational subject description sheet

Basic information

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| <p>Field of study Ecology and Evolution</p> <p>Speciality -</p> <p>Department Faculty of Biology</p> <p>Study level second cycle</p> <p>Study form full-time degree programme</p> <p>Education profile General academic</p> <p>Mandatory elective</p> | <p>Education cycle 2020/21</p> <p>Subject code UJ.WBIEEVS.250.1584358270.20</p> <p>Lecture languages English</p> <p>Disciplines Biological sciences</p> <p>ISCED classification 0511 Biology</p> <p>USOS code WB.INS.P-48</p> |
| Subject coordinator | Maria Niklińska |
| Lecturer | Maria Niklińska, Beata Klimek |

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| Periods Semester 1, Semester 3 | <p>Examination assessment</p> <p>Activities and hours lecture: 8, classes: 18, conversatory classes: 2, field classes: 2</p> | Number of ECTS points 2.0 |
|--|--|-------------------------------------|

Goals

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| C1 | Presentation of analytical methods and techniques used in environmental science and practical aspects of research |
| C2 | Planning, preparation and conducting the experiment in a small team (3-4 people), created in the course. |

Subject's learning outcomes

| Code | Outcomes in terms of | Effects | Examination methods |
|---|--|--|--|
| Knowledge - Student knows and understands: | | | |
| W1 | Student recognizes natural processes and phenomena using knowledge of biology, chemistry, statistics and mathematics. Understands the need for interdisciplinarity in scientific research | EEV_K2_W01, EEV_K2_W02, EEV_K2_W06 | Final quiz, credit with grade, project, report, findings, presentation |
| W2 | Knows the principles of observation and measurements as well as the use of research apparatus, knows the basic research tools and techniques used in the study of organisms and the environment. | EEV_K2_W01, EEV_K2_W02 | Final quiz, credit with grade, project, report, findings, presentation |
| W3 | Knows the principles of good laboratory practice and good scientific practice | EEV_K2_W02, EEV_K2_W08 | Final quiz, credit with grade, project, report, findings, presentation |
| W4 | Knows the rules of intellectual property and copyright protection. | EEV_K2_W08 | Final quiz, credit with grade, project, report, findings, presentation |
| Skills - Student can: | | | |
| U1 | Is able to plan and perform a simple laboratory and field experiment in a team, is able to perform analyzes and research tasks under the guidance of a scientific supervisor. | EEV_K2_U01, EEV_K2_U03 | Final quiz, credit with grade, project, report, findings, presentation |
| U2 | Is able to present the results of the experiment in the form of appropriate charts and tables, based on the results obtained is able to develop and write a detailed report containing conclusions and discussion of the results with literature cited and found in scientific databases | EEV_K2_U02, EEV_K2_U03, EEV_K2_U05, EEV_K2_U06, EEV_K2_U08 | Final quiz, credit with grade, project, report, findings, presentation |
| Social competences - Student is ready to: | | | |
| K1 | Is able to responsibly plan group work by doing laboratory experiments, knows how to work in a team while preparing a joint report | EEV_K2_K04, EEV_K2_K07 | Final quiz, credit with grade, project, report, findings, presentation |
| K2 | Cares about the reliability and credibility of the results obtained, and about the equipment and apparatus used in the tests, applies health and safety rules in the laboratory | EEV_K2_K01, EEV_K2_K02, EEV_K2_K03, EEV_K2_K08, EEV_K2_K09 | Final quiz, credit with grade, project, report, findings, presentation |

Calculation of ECTS points

| Activity form | Activity hours* |
|----------------------|-----------------|
| lecture | 8 |
| classes | 18 |
| conversatory classes | 2 |
| field classes | 2 |

| | | |
|--|--------------------|--------------------|
| collecting information for a given project | 10 | |
| report preparation | 5 | |
| preparation for final test | 8 | |
| preparation of a multimedia presentation | 7 | |
| Student workload | Hours 60 | ECTS 2.0 |
| Workload involving teacher | Hours 30 | ECTS 1.0 |

* hour means 45 minutes

Study content

| No. | Course content | Subject's learning outcomes |
|-----|--|--------------------------------|
| 1. | Principles and methods of research work in the laboratory and in the field (sampling and storage procedures, selection of the analytical method, reference materials, calibration solutions, dilution series, purity standards, standards in force in laboratories). Principles of analytical equipment operation (AAS, elemental analysis, microplate spectrometry, respirometry, gas chromatography, flow injection analysis, pH determination). | W1, W2, W3, W4, U1, U2, K1, K2 |
| 2. | Metody gromadzenia, zapisywania i przedstawiania danych doświadczalnych z wykorzystaniem programów komputerowych. Prawidłowe formy pracy naukowej (tabele, wzory matematyczne, typy wykresów) | W1, W2, W3, W4, U1, U2, K1, K2 |
| 3. | Methods for collecting, saving and presenting experimental data using computer programs. Correct form of scientific work (tables, mathematical formulas, chart types) | W1, W2, W3, W4, U1, U2, K1, K2 |

Course advanced

Teaching methods:

lecture, conversation lecture, discussion, laboratories, konsultacje

| Activities | Examination methods | Credit conditions |
|---------------------|-------------------------------|--|
| lecture | Final quiz, credit with grade | written course assesment in the form of a multiple-choice test and short open questions |
| classes | project, report, findings | obligatory attendance at laboratory and field classes and presentation of obtained results in the form of a report |
| conersatory classes | presentation | obligatory presence and presentation plan of the team experiment and results obtained |
| field classes | findings | obligatory presence |

Entry requirements

no

Literature

Obligatory

1. Jones, A., Duck, R., Reed, R., & Weyers, J. (2000). Practical skills in environmental science. Prentice Hall.
2. G.D. Ruxton, N. Colegrave 2003. Environmental design for the life sciences. Oxford University Press
3. Ch. Barnard, F. Gilbert, P.McGregor 2007. Asking questions in biology. Pearson Education Ltd

Optional

1. C.Ph. Wheater, J. Bell, P.Cook 2011. Practical Field Ecology, Wiley -Blackwell

Effects

| Code | Content |
|------------|--|
| EEV_K2_W01 | The graduate knows and understands the complexity of ecological processes and phenomena on the basis of empirical evidence found in various disciplines |
| EEV_K2_W02 | The graduate knows and understands methodology of biological sciences with a special focus on ecology and evolutionism; they can critically analyze data using relevant mathematical and statistical methods |
| EEV_K2_W06 | The graduate knows and understands the complexity of dependencies and mechanisms of evolution |
| EEV_K2_W08 | The graduate knows and understands basic and advanced methods of modeling the occurrence of phenomena and biological processes using mathematic, statistical and computational methods |
| EEV_K2_U01 | The graduate is able to use advanced research techniques and tools specific for various fields of ecology |
| EEV_K2_U03 | The graduate is able to use specialist English terminology in ecology and biology |
| EEV_K2_U02 | The graduate is able to search for and use scientific data in English obtained from various sources |
| EEV_K2_U05 | The graduate is able to plan and carry out research tasks or expertise work under the guidance of an academic supervisor |
| EEV_K2_U06 | The graduate is able to use advanced statistical tools and numerical techniques relevant for solving problems in ecology and related sciences |
| EEV_K2_U08 | The graduate is able to correctly formulate conclusions and judgements on the basis of collected empirical data |
| EEV_K2_K04 | The graduate is ready to identify and solve dilemmas related to their job following ethical principles |
| EEV_K2_K07 | The graduate is ready to take advantage of lifelong learning, inspire and organize the process of learning of others |
| EEV_K2_K01 | The graduate is ready to work in a team, assuming different roles, planning their tasks especially in terms of taking up different responsibilities and managing time |
| EEV_K2_K02 | The graduate is ready to listen to, accept or reject proposals offered by other team members |
| EEV_K2_K03 | The graduate is ready to appropriately define priorities related to the tasks assumed by themselves or by others |
| EEV_K2_K08 | The graduate is ready to apply self-criticism and draw conclusions on the basis of self-analysis |
| EEV_K2_K09 | The graduate is ready to consistently apply and popularize the rules of a strictly empirical interpretation of biological phenomena and processes in research and practice |