

SYLLABUS

REGARDING THE QUALIFICATION CYCLE 2021/2022 - 2023/2024

Academic year 2021/2022

1. BASIC COURSE/MODULE INFORMATION

Course/Module title	Principles of biostatistical analysis
Course/Module code *	
Faculty (name of the unit offering the field of study)	College of Natural Sciences
Name of the unit running the course	Institute of Biology and Biotechnology
Field of study	Biology
Qualification level	I degree
Profile	general academic
Study mode	stationary
Year and semester of studies	year I, sem. 1
Course type	Specialized course
Language of instruction	English
Coordinator	Prof. dr hab. Idalia Kasprzyk
Course instructor	Prof. dr hab. Idalia Kasprzyk

* - as agreed at the faculty

1.1. Learning format – number of hours and ECTS credits

Semester (n0.)	Lectures	Classes	Colloquia	Lab classes	Seminars	Practical classes	Internships	others	ECTS credits
1	10					22			3

1.2. Course delivery methods

- conducted in a traditional way

- involving distance education methods and techniques

1.3. Course/Module assessment (an exam, pass with a grade, pass without a grade)

2. PREREQUISITES

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Good communication, reading and writing English; knowledge of: Math, ability to use MS Excel package
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3. OBJECTIVES, LEARNING OUTCOMES, COURSE CONTENT, AND INSTRUCTIONAL METHODS

3.1. Course/Module objectives

O1	familiarizing the student with statistical functions in MS Excel and Statistica packages
O2	familiarizing the student with selected methods of processing numerical data and their graphical presentation
O3	teaching students to use statistical techniques in biological studies

3.2. COURSE/MODULE LEARNING OUTCOMES (TO BE COMPLETED BY THE COORDINATOR)

Learning Outcome	The description of the learning outcome defined for the course/module	Relation to the degree programme outcomes
LO_01	the graduate knows and understands the basic statistical concepts for necessary to describe and explain processes biological taking place	K_W01
LO_02	the graduate knows and understands basic statistical tests used in the biological studies	K_W02
LO_03	The graduate can select the appropriate statistical and graphic methods for data processing; performs basic analyzes	K_U02
LO_04	the graduate is able to use biologist terminology in English used in statistical analysis	K_U13

3.3. Course content (to be completed by the coordinator)

A. Lectures

Content outline
Fundamentals of the calculus of probability
Basic descriptive statistics
Relationships between two variables, methods of their evaluation
Stages of statistical inference; characteristics and application of tests for two or more samples
Characteristics and application of tests for two or more samples
Characteristics and application of the chi2 test

B. Classes, tutorials/seminars, colloquia, laboratories, practical classes

Content outline
Basic mathematical and statistical functions in MS Excel and Statistica packages
Statistical series and distributive series; graphical presentation of population distributions
Central location measures; skewness and flattening measures
Measures of data dispersion; rule of three standard deviations; rejection of extreme values
Correlation measures; linear and nonlinear regression
Tests for 2 samples (dependent and independent)
ANOVA
Chi2 test - assumptions and application

3.4. Methods of Instruction

e.g.

Lecture: a problem-solving lecture/a lecture supported by a multimedia presentation/ distance learning

Classes: text analysis and discussion/project work (research project, implementation project, practical project)/ group work (problem solving, case study, discussion)/didactic games/ distance learning

Laboratory classes: designing and conducting experiments

Lecture: Audio/video presentations.

Classes: practical work with computer packages, discussion

4. Assessment techniques and criteria

4.1 Methods of evaluating learning outcomes

Learning outcome	Methods of assessment of learning outcomes (e.g. test, oral exam, written exam, project, report, observation during classes)	Learning format (lectures, classes,...)
LO_01-02	A written and practical test, observations during lectures and practical work in classes	LECTURES, CLASSES
LO_03	A practical test, observations during practical work in classes	CLASSES
LO_04	A written and practical test, observations during lectures and practical work in classes	LECTURES, CLASSES

4.2 Course assessment criteria

Attendance is expected in all lectures, indoor workshops.

Assessment for this course is carried out in many different ways. It takes into consideration both knowledge of the lecture but also critical thinking skills, technical skills, communication skills and collaborative skills.

5. Total student workload needed to achieve the intended learning outcomes – number of hours and ECTS credits

Activity	Number of hours
Scheduled course contact hours	32
Other contact hours involving the teacher (consultation hours, examinations)	15
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	25
Total number of hours	72
Total number of ECTS credits	3

* One ECTS point corresponds to 25-30 hours of total student workload

6. Internships related to the course/module

Number of hours	n.a.
Internship regulations and procedures	n.a.

7. Instructional materials

<p>Compulsory literature:</p> <ul style="list-style-type: none"> • Zar J. Biostatistical analysis. • <i>TIBCO Software Inc. (2020). Data Science Textbook.</i> • HTTPS://DOCS.TIBCO.COM/DATA-SCIENCE/TEXTBOOK
<p>Complementary literature:</p> <ul style="list-style-type: none"> • Kelly D., Jasperse J., Westbrooke I. Designing science graphs for data analysis and presentation. DEPARTMENT OF CONSERVATION TECHNICAL SERIES 32, Science & Technical Publishing Department of Conservation PO Box 10-420 Wellington, New Zealand https://www.doc.govt.nz/documents/science-and-technical/docts32entire.pdf

Approved by the Head of the Department or an authorised person