



Biostatistics and methods of data collection
Educational subject description sheet

Basic information

Field of study Veterinary Medicine		Education cycle 2022/23
Speciality -		Subject code MD000000MWW-AJS.J1.3219.22
Organizational unit The Faculty of Veterinary Medicine		Lecture languages english
Study level Long-cycle programme		Mandatory mandatory
Study form Full-time		Block major subjects (conducted) in foreign languages
Education profile General academic		Disciplines Veterinary medicine
		Subject related to scientific research No
		Subject shaping practical skills Nie
Teacher responsible for the subject	Heliodor Wierzbicki	
Other teachers conducting classes	Heliodor Wierzbicki	
Period Semester 1	Examination graded credit	Number of ECTS points 2.0
	Activities and hours laboratory classes: 30	
	Standard groups A. Basic sciences, C. Supplementary classes	

Goals

C1	The overall purpose of the course is to provide students with theoretical knowledge and practical skills (application of the SAS computer system for statistical analyses of data) concerning biostatistical methods used when collecting and describing a data set (descriptive statistics) and hypotheses testing (parametric and non-parametric tests). Moreover, correlation and linear regression as well as analysis of variance is taught.
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Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge - Student knows and understands:			
W1	presents the basic IT and biostatistic methods used in veterinary medicine.	O.W15	test
Skills - Student can:			
U1	performs basic statistical analysis and uses appropriate methods for presentation of the results	O.U10	project
Social competences - Student is ready to:			
K1	uses the objective sources of information	O.K4	project
K2	formulates conclusions from own measurements or observations	O.K5	project

Balance of ECTS points

Activity form	Activity hours*	
laboratory classes	30	
project preparation	15	
class preparation	15	
Student workload	Hours 60	ECTS 2.0
Workload involving teacher	Hours 30	ECTS 1.0
Practical workload	Hours 30	ECTS 1.0

* hour means 45 minutes

Study content

No.	Course content	Activities
1.	1. Descriptive biostatistics (1) – basic definitions and concepts; measures of central tendency; measures of variability; random variables and their distributions; methods of data collection 2. Descriptive biostatistics (2) – basic definitions and concepts; measures of central tendency; measures of variability; random variables and their distributions; methods of data collection 3. The SAS computer system (Statistical Analysis System) – an introduction. 4. The SAS computer system – data management. 5. The SAS computer system – basic procedures (descriptive statistics). 6. Testing hypotheses (1) - basic definitions and concepts; types of hypotheses; significance level; critical value; rejection region; type I and II errors, power of the statistical test. 7. Testing hypotheses (2) – parametric tests; t-test (single sample; two independent samples; two paired samples). 8. Testing hypotheses (3) – non-parametric tests; chi-square test (one-way classification, two-way classification). 9. Correlation and linear regression. 10. Analysis of variance. 11. The SAS computer system - using the SAS system to test hypotheses – t-test; Duncan test; ch-square test. 12. The SAS computer system - using the SAS system to compute correlation coefficients and construct linear regression equation. 13. The SAS computer system - using the SAS system to perform analysis of variance. 14. Written test - using the SAS system for calculating descriptive statistics, hypotheses testing, computing correlation and regression and perform analysis of variance. 15. Final project presentation.	laboratory classes

Course advanced

Teaching methods:

project-based learning (PBL), teamwork, computer lab/laboratory, lecture

Activities	Examination methods	Percentage in subject assessment
laboratory classes	project, test	100%

Entry requirements

mathematics, computer science

Literature

Obligatory

1. Beginning statistics v.1,0. Douglas S. Shafer, Zhiyi Zhang.
<https://2012books.lardbucket.org/pdfs/beginning-statistics.pdf>
2. Basics of statistics. Jarkko Isotalo. <http://www.mv.helsinki.fi/home/jmisotal/BoS.pdf>

Optional

1. Starting SAS -
<https://support.sas.com/documentation/cdl/en/hostwin/69955/HTML/default/viewer.htm#p16esisc4nrd5sn1ps5l6u8f79k6.htm>

Kierunkowe efekty uczenia się

Kod	Treść
O.K4	Uses the objective sources of information
O.K5	Formulates conclusions from own measurements or observations
O.U10	Performs basic statistical analysis and uses appropriate methods for presentation of the results
O.W15	Presents the basic IT and biostatistic methods used in veterinary medicine.