Code of subject	M_WE_SEM2 BIOST ANG
Field of study	Veterinary medicine
Name of the training module including the Polish name	Biostatistics and methods of documentation
	Biostatystyka i metody dokumentacji
Language of instruction	English
Type of the training module	Mandatory
Level of the training module	Long-cycle master's degree studies
Form of studies	Full-time
Location in the programme (year)	I
Location in the programme (semester)	II
Number of ECTS credits with a division into contact/noncontact	2 (1/1)
Name and surname of the person in charge	Arkadiusz Miaskowski
Unit offering the subject	Department of Applied Mathematics and Computer Science
Aim of the module	Acquainting students with basic concepts of the theory of probability and mathematical statistics; ability to use descriptive statistics for elementary analysis of experimental data; knowledge of statistical inference – estimation, hypothesis testing; knowledge of and ability to use computer software for statistical data analysis (e.g. Excel, Python programming language).
Learning outcomes – the total number of learning outcomes may not exceed (4-8) for the module. The description of the intended learning outcomes that a student should achieve after the completion of the module should be provided. The outcomes for all forms of classes used should be presented.	Knowledge:
	K1. Knowledge of basic concepts of the theory of probability and mathematical statistics (probability, random variable, distribution, distribution function, density, population and sample, estimator, confidence interval, test).
	K2. Knowledge of basic distribution and estimator types used in mathematical statistics and ability to describe their characteristics.
	K3. Ability to demonstrate model confidence intervals and tests.
	Skills:
	S1. Ability to apply a preliminary (descriptive) experimental data analysis.
	S2. Ability to adapt model examples of statistical inference in given situations.
	S3. Ability to use computer software (e.g. Excel, Python programming language) in statistical analysis and inference.
	Social competences:
	C1. Ability to estimate the task difficulty and consciously choise he right tools for its implementation
	C2. A need for improvement of one's knowledge and skills in the time of rapid technological growth. Awareness of the need for mathematical modelling of phenomena for the purpose of scientific cognition.
Preliminary and additional requirements	---

Contents of the training module – a compact description	Descriptive statistics (construction of stem-and-leaf displays, determining basic characteristics: measures of position, dispersion, asymmetry and concentration) Elements of the theory of probability (probability, random variable, distribution function, density, discrete and continuous probability distributions – examples: binominal distribution, Poisson distribution, normal distribution, Student's t-distribution, Chi-square) Point and interval estimation (construction of confidence intervals for a mean, mean difference, variance, variance ratio) Parametric tests (mean and variance hypothesis testing) Non-parametric tests (testing the characteristics independence and distribution conformity hypotheses)
Recommended and obligatory reading list	1. W. McKinney, Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, (2017), O'Reilly Media; 2nd edition 2. J. Schmuller, Statistical Analysis with Excel (2016), ISBN-13 : 978-1119271154
The intended forms/activities/ teaching methods	Teaching methods: Lecture, computer laboratory, tutorials, consultations.
Methods of verification and documentation forms of the achieved learning outcomes	During the computer laboratory students are free to choose calculation spreadsheet or Python programming language in order to complete the laboratory tasks. Python programming language is preferred to complete the assignments than, for example, MS Excel. Student are obliged to solve and analyse selected problems during laboratory exercises. The lecture's topics are divided into 4 main sections and during the computer laboratory the students' knowledge is verified in practice. The final grade is calculated as the mean value on the base of 4 marks in scale from 2.0 to 5.0. Mark 3.0 (dostateczny) is received if student has got 61% preparing each assignments. The grading scale is in line with the Faculty Book of Education Quality
Balance of ECTS credits	Contact hours Lectures – 15h (0,425 ECTS) Laboratory classes – 15h (0,425 ECTS) Consultations – 5h (0,15 ECTS) Non-contact hours Studying recommended literature – 15h (0.5 ECTS) Preparation for the classes – 15h (0.5 ECTS)
Number of contact hours	Participation in lectures – 15h (0,425 ECTS) Participation in lab classes – 15h (0,425 ECTS) Participation in Consultations – 5h (0,15 ECTS)

Relationship between subject learning outcomes and veterinary studies learning outcomes	K1-other++ K2-other++ K3-other++ S1- C.U3+, U-other ++ S2- C.U3+, U-other ++ S3- C.U3+, U-other ++ C1- K8+++ C2- K7+
Impact of selected compounds to final grade	K1 -3 – 30% S1-4 – 65% C1 – 5% If student wants to get better grade the assignments should be completed using Python programming language.