Subject: Statistics

I. General information

Organization unit	Faculty of Physical Education	
	Chair: Human Biology	
	Supervisor: Prof. Monika Łopuszańska-Dawid	
Course name	Statistics	
Subject code	7/1/II/PE	
Teaching language	English	
Type of subject (obligatory/ facultative)	facultative	
Level of studies (eg. bachelor, master)	master	
Study year	1	
Semester	2	
ECTS points	4	
Teacher	Jan Gajewski (jan.gajewski@awf.edu.pl) Paweł Tomaszewski (pawel.tomaszewski@awf.edu.pl)	
Studies program in which the subject is realized	PHYSICAL EDUCATION	
Method of realization (stationary/ distance learning)	stationary	
Prerequisites	Basic knowledge on information technology, basic skills in using formulas and functions of a calculation spreadsheet.	

II. Detailed Information

Course aims and objectives

A1	Preparing a graduate to independently collect and organize data obtained as a result of
	physical education and sport research and how to process it using a statistical account
A2	Facilitate the principles of formulating and verification of statistical hypotheses and the
	ability to formulate conclusions on the basis of statistical outcomes
A3	Developing practical skills of conscious and efficient use of selected computer programs
	for computational purposes and proper presentation of results of the analysis.

Learning outcomes

Learning outcome	Subject's learning outcomes			
Knowledge				
K_W03 Knows objectives and functions of				
sport sciences - subjects and methods.				
Knows and understands basic principles of				
logic, principles of scientific research,				
research workflows and basic methods,				
techniques and research tools. Understands	Knows the basic statistical concepts, distinguishes between types of statistical variables, types of measurement scales. Knows the methods of statistical description - empirical distribution of the variable and numerical characteristics of the distribution.			
the sampling method. Knows the rules of				
writing a research paper and ethical				
principles applicable in research.				
K_W07 Knows basic statistical methods,				
principles of quantitative data processing				
and ways of is deployment in scientific work.				
Recognises and understands the principles				
of formulation and verification of statistical				
hypotheses and understands an aspects				
K W07 Knows basic statistical methods				
nrinciples of quantitative data processing				
and ways of is deployment in scientific work.				
Recognises and understands the principles				
of formulation and verification of statistical				
hypotheses and understands all aspects	Knows the principles of planning and			
comprised by statistical analysis.	conducting research in physical education and sports. Understands the principles of collecting and organizing parametric and nonparametric data and distinguishes the methods of their processing using a statistical methods. Knows the basics of statistical inference			
K_W09 Knows forms, means and methods				
as well as the specific nature of the				
organization of training in diverse sport				
disciplines and is capable of working with				
young people, adults and retirees. Knows				
the rules of developing own original physical				
education and health plans. Comprehends				
the need of innovation and innovative and				
research work in sport. Knows and				
understands the process of planning,				
implementation and evaluation.				
SKI	lls			
K_003 Ability to formulate and solve				
research problems in the context of physical	Is able to prepare research tools and			
methods of research and to use research	conduct research in the field of physical			
tools available as well as to evaluate	education and sport. Is able to use selected			
accented research procedures and to	computer programs to process data			
interpret results achieved	obtained as a result of research.			
K_U07 Ability to create basic research tools				

based on recognised methods applied in		
social research. Ability to perform an		
environment and group diagnosis. Ability to		
interpret social facts related to sports in an		
independent way (physical culture).		
K_U03 Ability to formulate and solve		
research problems in the context of physical		
culture sciences. Ability to use basic		
methods of research and to use research		
tools available, as well as to evaluate		
accepted research procedures and to		
interpret results achieved.		
K_U07 Ability to create basic research tools		
based on recognised methods applied in	He is able to properly interpret the results	
social research. Ability to perform an	He is able to properly interpret the results	
environment and group diagnosis. Ability to	has a them	
interpret social facts related to sports in an	based on them.	
independent way (physical culture).		
K_U08 Ability to make use of basic statistical		
methods for needs of research work. Ability		
to compile, describe and analyse		
quantitative and qualitative data and to		
interpret the obtained results. Ability to		
formulate substantive conclusions based on		
statistical conclusions.		
K_U07 Ability to create basic research tools	Is able to correctly present the results of	
based on recognised methods applied in	tests in tables and graphs. Has the ability to	
social research. Ability to perform an	prepare a written study and an oral	
environment and group diagnosis. Ability to	presentation based on the results of own	
interpret social facts related to sports in an	research.	
independent way (physical culture).		
Social Con	npetences	
K_K10 Ability of independent and critical		
complementing of own knowledge and skills.	Has the need to supplement and improve	
Use of interdisciplinary approach to the field	acquired knowledge and skills on applied	
of specialisation during the execution of	statistics.	
assigned tasks.		
K_K02 Involvement in creative problem		
solving, planning and execution of		
educational activities in different social		
environments independently and in a team.		
K_K04 Readiness to undertake individual	Works in a team performing various tasks	
activities and to execute them in a	works in a team performing various tasks.	
systematic and professional way. Ability to		
manage human resources in achieving		
complex professional tasks of educational		
character (recreational and health).		

K_K09 Involvement in the work of groups and teams acting for people with disabilities and excluded persons.	
 K_K02 Involvement in creative problem solving, planning and execution of educational activities in different social environments independently and in a team. K_K04 Readiness to undertake individual activities and to execute them in a systematic and professional way. Ability to manage human resources in achieving complex professional tasks of educational character (recreational and health). K_K10 Ability of independent and critical complementing of own knowledge and skills. Use of interdisciplinary approach to the field of specialisation during the execution of assigned tasks. 	Consciously applies methods of statistical inference in empirical research and adheres to the principles of formal conclusion in scientific research.

Syllabus contents

No	Title	
Classes/ Practical classes		
SC1	Statistical variables – types, entering the data, creation of stemplots and of histograms; cumulative distribution function.	
SC2	Types and characteristics of continuous variables distributions, descriptive statistics: measures of central tendency and of variability, degrees of freedom.	
SC3	Properties of normal distribution, testing of normality, transformations, standardised variable.	
SC4	Cumulative distribution function, percentile charts – exercises.	
SC5	Standardization against individual or reference values, multivariate analysis – multivariate profiles, ranking.	
SC6	Mid-semester test – verification of practical skills in utilising of cumulative distribution function and of percentile charts.	
SC7	Relationships between continuous variables, assessment of correlation coefficient, coefficient of determination	
SC8	Linear regression of the two variables, calculation of regression equations, prediction of dependent variable, residuals, curvilinear regressions.	
SC9	Comparison of means – Student's t-test for independent data.	
SC10	Comparison of means – Student's t-test for dependent data.	
SC11	Analysis of frequency – chi-square test (G function), analysis of two-way tables (2×2)	
SC12	Analysis of multi-way tables (2×3, 2×4)	
SC13	Operations with approximate numbers.	
SC14	Measurement errors. Repeatability of measurements. Intracalss correlation.	

SC15	Verification of analytic skills: statistical analysis – practical test.
Accessment criterion:	

Assessment criterion:

Students' activity, test of knowledge, test of practical skills

Obligatory literature:

1. Clark D.H. (1999) Research Problem in Physical Education 2nd edition, Eaglewood Cliffs, Prentice Hall, Inc.

2. Jerry R Thomas & Jack K Nelson (2000) Research Methods in Physical Activities; Illonosis; Human Kinetics;

3. Jones, I., Brown, L. & Holloway, I. (2013). Qualitative research in sport and physical activity London: SAGE Publications Ltd

4. Rothstain A (1985) Research Design and Statistics for Physical Education, Englewood Cliffs: Prentice Hall, Inc.

5. Verma, J. P. (2011). Statistical Methods for Sports and Physical Education. Tata McGraw Hill Education Private Limited.

1ECTS point = 30 hours students work (contact + self study)

TYPES OF CLASSES	HOURS	
Contact hours	30	
Self study	90	
Total = 120 hours = 4 ECTS		