

Subject: **Statistics**

GENERAL INFORMATION

Organization unit	Faculty of: Physical Education Chair of: Human Biology Chairman: 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
Professor	Szymon Kulis PhD; szymon.kulis@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

DETAILED INFORMATION

Course aims and objectives

The primary aim of the course *Statistics* is to equip graduate students in Physical Education with foundational and applied knowledge of statistical methods essential for conducting research in sport and physical activity sciences. The course is designed to ensure that students acquire the theoretical understanding and practical skills necessary to collect, organize, analyze, and interpret quantitative data within the context of physical education and sport sciences.

Specific objectives of the course include:

- To prepare students for the independent collection and organization of data derived from physical education and sports research, as well as for processing this data using appropriate statistical methods.
- To develop a solid understanding of the principles of statistical hypothesis formulation and verification, and the ability to draw meaningful scientific conclusions based on statistical outcomes.

- To cultivate practical competencies in using selected computer software for statistical analysis and to present analytical results in a clear and scientifically appropriate manner.

Through the integration of theoretical lectures and hands-on practice, students will enhance their research capabilities and become proficient in applying statistical reasoning to empirical studies in the field of sport and physical education.

Obligatory Literature

1. Clark, D.H. (1999). *Research Problems in Physical Education* (2nd edition). Englewood Cliffs: Prentice Hall, Inc.
2. Thomas, J.R., & Nelson, J.K. (2000). *Research Methods in Physical Activities*. Illinois: 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*. New Delhi: Tata McGraw Hill Education Private Limited.

Main topics

No	Topic
Lectures/classes	
1	Statistical variables – types, entering the data, creation of stemplots and of histograms; cumulative distribution function.
2	Types and characteristics of continuous variables distributions, descriptive statistics: measures of central tendency and of variability, degrees of freedom.
3	Properties of normal distribution, testing of normality, transformations, standardised variable.
4	Cumulative distribution function, percentile charts – exercises.
5	Standardization against individual or reference values, multivariate analysis – multivariate profiles, ranking.
6	Mid-semester test – verification of practical skills in utilising of cumulative distribution function and of percentile charts.
7	Relationships between continuous variables, assessment of correlation coefficient, coefficient of determination



8	Linear regression of the two variables, calculation of regression equations, prediction of dependent variable, residuals, curvilinear regressions. Comparison of means – Student's t-test for independent data.
9	Comparison of means – Student's t-test for independent data.
10	Comparison of means – Student's t-test for dependent data.
11	Analysis of frequency – chi-square test (G function), analysis of two-way tables (2×2)
12	Analysis of multi-way tables (2×3, 2×4)
13	Operations with approximate numbers.
14	Measurement errors. Repeatability of measurements. Intraclass correlation.
15	Verification of analytic skills: statistical analysis – practical test.

CONDITIONS FOR PASSING CLASSES:

Students must pass a practical test evaluating their ability to apply the skills acquired during the course. The practical test will be assessed and graded.

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

TYPES OF CLASSES	HOURS
1. Contact classes	30
2. Students' preparations of the presentations	



3. Self study as preparation to the written exam	90
4. Self study as reading text prepared by the teacher	
Total = 120 hours- ECTS points 4	

Author of the class card:	Name, surname and email
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