

KARTA PRZEDMIOTU**I. Dane podstawowe**

Nazwa przedmiotu	Statystyczna analiza danych
Nazwa przedmiotu w języku angielskim	Statistical Analysis of Data
Kierunek studiów	Informatyka
Poziom studiów (I, II, jednolite magisterskie)	I-stopnia
Forma studiów (stacjonarne, niestacjonarne)	stacjonarne
Dyscyplina	Informatyka
Język wykładowy	Angielski

Koordinator przedmiotu/osoba odpowiedzialna	
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Forma zajęć (<i>katalog zamknięty ze słownika</i>)	Liczba godzin	semestr	Punkty ECTS
wykład	30	IV	5
konwersatorium			
ćwiczenia			
laboratorium	30	IV	
warsztaty			
seminarium			
proseminarium			
lektorat			
praktyki			
zajęcia terenowe			
pracownia dyplomowa			
translatorium			
wizyta studyjna			

Wymagania wstępne	W1. Introduction to differential and integral calculus W2. Basics of probabilistic methods
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II. Cele kształcenia dla przedmiotu

C1. The main aim of the course is to familiarize students with the methods and procedures of descriptive statistics and mathematical statistics.
C2. Students will get acquainted with the basic methods and objectives of descriptive statistics, such as the use of statistical measures, charts and methods of statistical inference, such as estimation and statistical testing principles.

III. Efekty uczenia się dla przedmiotu wraz z odniesieniem do efektów kierunkowych

Symbol	Opis efektu przedmiotowego	Odniesienie do efektu kierunkowego
WIEDZA		
W_01	Students know basic probability distributions	K_W02
W_02	Students know the basic measures and graphs of descriptive statistics. Students are able to compare various statistical tests and choose the appropriate one for the problem in question. Students know the basic concepts of statistics, such as estimation, statistical error, statistical hypothesis, level of significance, prediction. Students know the basic elements of regression analysis	K_W02
W_03	Students have knowledge of the selected statistical software	K_W025
UMIĘTNOŚCI		
U_01	Students have the ability to apply statistical measures for population and sample. Students have the ability to perform statistical tests in the case of regression analysis. Students have the ability to conduct simple statistical inference and conduct simple forecasting in the case of regression analysis	K_U22, K_U28
U_02	Students have the ability to conduct computer data analysis in case of problems with descriptive statistics and computer data analysis in the case of simple statistical inference	K_U03, K_U22, K_U28
U_03		
KOMPETENCJE SPOŁECZNE		
K_01	Students are able to start a discussion about statistical inference and statistical methods	K_K07
K_02		

IV. Opis przedmiotu/ treści programowe

1. Main goals, advantages and disadvantages of statistics - examples of statistical problems, basic definitions (population, sample, random variable), measurement scales.
2. Basic statistical concepts - empirical distribution, data series, time series, types of data, quantity, cumulative quantity.
3. Measurements of descriptive statistics - average, median, quartiles, quintiles, standard deviation, variance, range. Other measures of descriptive statistics.
4. Statistical charts - histogram, side-and-must chart, pie chart, line chart, other charts.
5. Review of some distributions of random variables - discrete distributions and continuous distribution (binomial distribution, Poisson distribution, normal distribution, exponential distribution, Student's t-distribution).
6. Estimation - point estimation, estimator features, moment method, estimation of the maximum probability, methods and examples of interval estimation.
7. Statistical tests - the concept of zero hypothesis, alternative hypothesis, level of significance, types of errors, critical value.
8. Selected examples of statistical tests (chi-square tests, tests of means, Kolmogorov-Smirnov test, etc.).
9. Introduction to multidimensional analysis, concept of variable dependencies (covariance and correlation)

coefficient). Basics of regression analysis (linear and nonlinear).
 10. Time series - smoothing time series, dynamics indicators. Discussion on the basics of forecasting time series.
 11. Introduction to simulation methods - Monte Carlo method and its application.

V. Metody realizacji i weryfikacji efektów uczenia się

Symbol efektu	Metody dydaktyczne (lista wyboru)	Metody weryfikacji (lista wyboru)	Sposoby dokumentacji (lista wyboru)
WIEDZA			
W_01	Lecture	Exam, tests	Filled, evaluated tests and exams
W_02	Lecture	Exam, tests	Filled, evaluated tests and exams
W_03	Work under direction	Submitted spreadsheets, documentation	printouts
UMIĘTNOŚCI			
U_01	Practical classes	Submitted spreadsheets, documentation	printouts
U_02	Practical classes	Submitted spreadsheets, documentation	printouts
U_....			
KOMPETENCJE SPOŁECZNE			
K_01	Discussion	Submitted spreadsheets, documentation	printouts

VI. Assesment criteria

Lecture. Based on written exam

90 – 100% (5,0)

80 – 89% (4,5)

70 – 79% (4,0)

60 – 69% (3,5)

50 – 59% (3,0)

less than 50% (2,0)

Classes

80% of attendance required

Based on two tests and submitted work

90 – 100% (5,0)

80 – 89% (4,5)

70 – 79% (4,0)

60 – 69% (3,5)

50 – 59% (3,0)

less than 50% (2,0)

The student may be released from the written part of the exam on the basis of the result obtained in tests. Detailed exemption conditions are given to students with each edition of the subject. Further details shall be given during the classes and lecture

VII. Obciążenie pracą studenta

Forma aktywności studenta	Liczba godzin
Liczba godzin kontaktowych z nauczycielem	90
Liczba godzin indywidualnej pracy studenta	50

VIII. Literatura

Literatura podstawowa
William Mendenhall, Robert J. Beaver, Barbara M. Beaver "Introduction to Probability and Statistics" David Freedman, Robert Pisani, Roger Pruves "Statistics" Viva Books, 2011 Andrzej Stanisławski, "Accessible Statistics Course", Cracow 2001 Amir D. Aczel "Complete business statistics" Wohl Publishing; 8th edition (2012)
Literatura uzupełniająca
Roxy Peck, Chris Olsen, Jay Devore "Introduction to Statistics and Data Analysis" Cengage Learning, Jan 1, 2011