

**Nazwa kierunku studiów:**

**Psychologia**

**Nazwa przedmiotu: Introduction to Statistics**

Poziom studiów: I stopnia

Forma studiów: Stacjonarne

Profil studiów: ogólnoakademicki

Nazwa przedmiotu: Introduction to Statistics

### Forma zajęć i punkty ECTS

	Liczba godzin	Punkty ECTS	Sposób zaliczenia
ćwiczenia	30		zaliczenie z oceną
wykłady	30		egzamin
Razem	60	6	

### Cele kształcenia

Goals of the course are:

1. to familiarize the students with the role of statistics in scientific psychology and to link knowledge of statistics with knowledge of research methods. [Form of classes: lecture]
2. to familiarize students with selected descriptive statistics, with the logic of statistical inference and the theoretical assumptions of basic statistical tests. [Form of classes: lecture and exercises]
3. to familiarize the students with the IBM-Imago computer environment (SPSS) which supports the researcher's work in entering the collected data into the electronic database, in calculating synthetic descriptive indicators of these data and in conducting individual statistical tests enabling statistical inference of research hypotheses. [Form of classes: exercises]

## Efekty uczenia się

<b>Kategoria: WIEDZA</b>		
<b>SYMBOL EFEKTU UCZENIA SIĘ</b>	<b>OPIS EFEKTU UCZENIA SIĘ</b>	<b>ODNIESIENIE EFEKTU DO EFEKTU KIERUNKOWEGO</b>
P_W1	The student understands the probabilistic nature of empirical research and the logic of statistical inference.	Ps_WG01_Lic Ps_WG04_Lic
P_W2	The student distinguishes and defines the basic concepts of descriptive statistics and statistical inference. He/she can present the interrelationships between these concepts.	Ps_WG01_Lic Ps_WG04_Lic
P_W3	Using specific examples of random events, the student can explain the basic issues related to statistical inference (such as central limit theorem, sample distribution of the mean, standard error, confidence interval, level of significance, rejection area of the null hypothesis).	Ps_WG01_Lic Ps_WG04_Lic
<b>Kategoria: UMIEJĘTNOŚCI</b>		
<b>SYMBOL EFEKTU UCZENIA SIĘ</b>	<b>OPIS EFEKTU UCZENIA SIĘ</b>	<b>ODNIESIENIE EFEKTU DO EFEKTU KIERUNKOWEGO</b>
P_U1	The student is able to decide which statistical procedures are the most adequate to summarize the data and for statistical inference, based on the chosen research design and the characteristics of the sample.	Ps_UW02_Lic Ps_UW03_Lic Ps_UW04_Lic Ps_UK01_Lic Ps_UK02_Lic
P_U2	The student is able to apply the appropriate methods of analysis, interpret the results obtained and discuss the conclusions derived from them.	Ps_UW04_Lic Ps_UK01_Lic Ps_UK02_Lic
<b>Kategoria: KOMPETENCJE SPOŁECZNE</b>		
<b>SYMBOL EFEKTU UCZENIA SIĘ</b>	<b>OPIS EFEKTU UCZENIA SIĘ</b>	<b>ODNIESIENIE EFEKTU DO EFEKTU KIERUNKOWEGO</b>
P_K1	The student is an active participant in the process of exchange of scientific information, is able to communicate the results of statistical surveys, as well as critically evaluate reports from statistical surveys of other authors.	Ps_KK01_Lic Ps_KR02_Lic Ps_KR03_Lic
P_K2	The student is a propagator of the scientific approach to psychology and is able to explain its advantages and limitations.	Ps_KK01_Lic

## Treści programowe przedmiotu

NUMER	OPIS ZAGADNIENIA	FORMA ZAJĘĆ	LICZBA GODZIN
1	The goals of statistics - Descriptive and inferential statistics; scales of measurement and types of variables; discrete and continuous variables; examples of variables and ways to measure them.	wykłady	3 / 3
2	Statistical summary, descriptive statistics - Central tendency measures, measures of dispersion, frequencies, cross tables, distribution properties - kurtosis, skewness, calculation of the mean, median, variance, standard deviation.	wykłady	3 / 3
3	Relationship between quantitative variables - Pearson's r correlation coefficient, computation of Pearson's r based on sample data. Relationship between ordinal variables - non-parametric Spearman's rho and Kendall's tau tests. Assessment of the strength and direction of the relationship for r, tau and rho. Prediction and regression line.	wykłady	3 / 3
4	Probability - Understanding probability: frequentist and subjective probability, examples of random events. Probability distributions of random variables - Examples of continuous and discrete random variables' probability distributions: binomial distribution and normal distribution; mass and density probability functions; reading probability table of the standardized normal curve (z scores).	wykłady	3 / 3
5	Sampling distribution of the mean - Demonstration of the central limit theorem: computer simulation of multiple samplings. Properties of the sampling distribution of the mean: mean and standard deviation (standard error).	wykłady	3 / 3
6	Logic of statistical inference - Point and interval estimation, Confidence intervals. Introducing the Student's t distribution.	wykłady	3 / 3
7	Hypothesis testing - null and alternative hypothesis; hypotheses on the value of the population mean (one sample test), and on the means' differences between groups (two samples tests - dependent and independent measures). Significance level. Type-I (alpha) and type-II (beta) inference errors. Step-by-step methodology of inference testing. Relationship between type-I error, statistical power, effect size and sample size.	wykłady	3 / 3
8	Test for differences among samples - Dependent measures and independent measures samples. Parametric tests: t test for dependent and independent measures samples and for one sample. Checking assumptions for parametric tests. T distribution, degrees of freedom for the t test, confidence interval for the t statistics, null hypothesis rejection area, significance level for the t test. Calculating t statistics. One and two-sided tests. Non-parametric U-Mann Whitney's test and Wilcoxon's test.	wykłady	6 / 6
9	Analyzing qualitative data - Chi squared tests. Goodness of fit and Test of association. Research plans in which the chi-square test is used. Properties of the chi-square distribution.	wykłady	3 / 3
10	Introduction to the IMAGO IBM-SPSS computing environment. Data tab and variables tab. Report window. Entering and loading data. Coding, recoding and transforming variable values.	ćwiczenia	6 / 6
11	Descriptive statistics and frequency tables for one variable and in subgroups (numerical variable divided into categories of nominal variable). Crosstabs and their interpretation.	ćwiczenia	6 / 6

NUMER	OPIS ZAGADNIENIA	FORMA ZAJĘĆ	LICZBA GODZIN
12	Computing relationships between variables. Correlation coefficient and Pearson's r test (after checking its assumption). The Spearman's rho and Kendall's tau correlation coefficients. Relationships between nominal variables - chi square test	ćwiczenia	9 / 9
13	Independent samples comparison among means. Assumptions for parametric tests and Student's t test for independent samples. Non-parametric Mann-Whitney's U test. Dependent samples comparison among means. Assumptions for parametric tests and Student's t-test for dependent samples. Wilcoxon non-parametric test.	ćwiczenia	9 / 9

## Warunki zaliczenia

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### ĆWICZENIA

FORMA ZALICZENIA	WAGA FORMY ZALICZENIA
Obecność na zajęciach	10
Zaliczenie	90

### WYKŁADY

FORMA ZALICZENIA	WAGA FORMY ZALICZENIA
Egzamin	90
Obecność na zajęciach	10

## Metody kształcenia

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- Wykład interakcyjny (prezentacja w PowerPoint, dyskusja, rozwiązywanie problemów, omawianie przypadków)
- ćwiczenie umiejętności - indywidualne (np. praca na komputerze, prezentacja wyników samodzielnej pracy)

## Literatura przedmiotu (obowiązkowa)

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- Witte J. & Witte R.. Statistics 2017

## Literatura przedmiotu (uzupełniająca)

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- Field A.. Discovering statistics using SPSS 2011

## Odniesienie efektów przedmiotowych do efektów kierunkowych, treści kształcenia, metod weryfikacji

SYMBOL EFEKTU UCZENIA SIĘ	ODNIESIENIE DANEGO EFEKTU DO EFEKTU KIERUNKOWEGO	ODNIESIENIE DANEGO EFEKTU DO TREŚCI KSZTAŁCENIA (NAUCZANIA)	ODNIESIENIE DANEGO EFEKTU DO METODY WERYFIKACJI
<b>WIEDZA</b>			
P_W1	Ps_WG01_Lic Ps_WG04_Lic	1 3 4 5 6 7 8 9	Egzamin
P_W2	Ps_WG01_Lic Ps_WG04_Lic	1 2 3 4 5 6 7 8 9 13	Egzamin
P_W3	Ps_WG01_Lic Ps_WG04_Lic	5 6 7 8 9	Egzamin
SYMBOL EFEKTU UCZENIA SIĘ	ODNIESIENIE DANEGO EFEKTU DO EFEKTU KIERUNKOWEGO	ODNIESIENIE DANEGO EFEKTU DO TREŚCI KSZTAŁCENIA (NAUCZANIA)	ODNIESIENIE DANEGO EFEKTU DO METODY WERYFIKACJI
<b>UMIĘTNOŚCI</b>			
P_U1	Ps_UW02_Lic Ps_UW03_Lic Ps_UW04_Lic Ps_UK01_Lic Ps_UK02_Lic	1 2 3 4 5 6 7 8 9 10 11 12 13	Egzamin zaliczenie ćwiczenia do wykonania
P_U2	Ps_UW04_Lic Ps_UK01_Lic Ps_UK02_Lic	3 6 7 8 9 10 11 12 13	Egzamin zaliczenie ćwiczenia do wykonania

SYMBOL EFEKTU UCZENIA SIĘ	ODNIESIENIE DANEGO EFEKTU DO EFEKTU KIERUNKOWEGO	ODNIESIENIE DANEGO EFEKTU DO TREŚCI KSZTAŁCENIA (NAUCZANIA)	ODNIESIENIE DANEGO EFEKTU DO METODY WERYFIKACJI
<b>KOMPETENCJE SPOŁECZNE</b>			
P_K1	Ps_KK01_Lic Ps_KR02_Lic Ps_KR03_Lic	2 3 4 5 6 7 8 9 10 11 12 13	Dyskusja ćwiczenia do wykonania
P_K2	Ps_KK01_Lic	8 9 10 11 12 13	dyskusja