DESCRIPTION OF THE COURSE OF STUDY

Course code		
Name of the course in	Polish	**Metody statystyczne**
	English	**Statistical Methods**

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	physics
1.2. Mode of study	Full-time
1.3. Level of study	2nd degree
1.4. Profile of study	General academic
1.5. Person/s preparing the course description	Dr hab. Aldona Kubala-Kukuś, prof. UJK
1.6. Contact	aldona.kubala-kukus@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	English
2.2. Prerequisites	-

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes		Lecture, laboratory
3.2. Place of classes		Courses in the UJK teaching rooms of the Faculty of Exact and Natural Science
3.3. Form of assessment		Exam, Credit with grade
3.4. Teaching methods		Lecture – informative lecture Laboratory - practical classes
3.5. Bibliography	**Required reading**	1. 1. T. Hill, P. Lewicki, STATISTICS Methods and Applications, StatSoft Inc., Tulsa, 2006. 2. 2. A. Stanisz, Przystępny kurs statystyki z zastosowaniem STATISTICA, t.1-3, StatSoft Polska, 2007. 3. R. Nowak, Statystyka dla fizyków, Warszawa, 2002.
	Further reading	1. A. Stanisz, Analiza danych w programie STATISTICA. Kraków: StatSoft Polska, 2013. 2. S. Brandt, Analiza danych, PWN, Warszawa, 1998.

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives (including form of classes)
Knowledge (lectures and laboratories) C1 – To give students a knowledge of basic properties of the underlying mathematics necessary for statistics. C2 – To give students a knowledge of statistical methods. C3 - To give students a knowledge of applications of the statistical methods in different physical problems. **Abilities (laboratories and project)** C4 – Developing skills to application selected statistical methods in data analysis. C5 – Developing skills to use selected statistical methods with the application of software supporting statistical calculations.

4.2. Detailed syllabus (including form of classes)

Lecture:
The distribution of statistical data. Descriptive statistics. Types of statistical inference. Point and interval estimation of random variable parameters. Statistical hypotheses. Process of statistical hypothesis testing. Hypothesis testing: one, two and multi sample inference. Nonparametric methods. Goodness-of-fit tests. Test of independence. Regression and correlation methods. Analysis of variance. Logistic regression. Survival analysis. Random right-censored data. Random left-censored data. Multivariate analyzes.

Laboratory:
Exploring data by descriptive statistics and graphics. Assessing normality of data by tests and graphical methods. Point and interval estimation – computing and interpretation. Hypothesis testing: one, two and multi sample inference. Nonparametric methods. Goodnes-of-fit tests. Test of independence. Regression and correlation methods. Analysis of variance. Application of logistic regression model. Creation of survival curve. Comparing survivals in groups. Survival analysis. Random right-censored data. Random left-censored data. Multivariate analyzes. Note: for implementation of the above content to support calculation and visualization of data, the program STATISTICA is used (licensed commercial program), as well as MS Excel program.

4.3. Education outcomes in the discipline

Code	A student, who passed the course	Relation to learning outcomes
within the scope of **KNOWLEDGE:**		
W01	knows the basic properties of the underlying mathematics necessary for statistics	P8U_W
W02	knows the statistical methods	P8U_W
W03	knows the examples of applications of the statistical methods in different physical problems	P8U_W
within the scope of **ABILITIES:**		
U01	applies different statistical methods in data analysis	P8U_U
U02	uses different statistical methods with the application of software supporting statistical calculations	P8U_U

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes *(code)*	Method of assessment (+/-)																				
	Oral answer			Project			Self-study			Group work			Exam								
	Form of classes			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*		
	L	*C*	*P*	*L*	*C*	*P*	*L*	*C*	*P*	*L*	*C*	*P*	*L*	*C*	*P*	*L*	*C*	*P*	*L*	*C*	*P*
W01					***X***								***X***								
W02					***X***								***X***								
W03					***X***								***X***								
U01					***X***								***X***								
U02					***X***								***X***								

4.5. Criteria of assessment of the intended learning outcomes		
Form of classes	**Grade**	**Criterion of assessment**
lecture (L)	**3**	at least 50% and not more than 60% of the total number of available points
	3,5	more than 60% and not more than 70% of the total number of available points
	4	more than 70% and not more than 80% of the total number of available points
	4,5	more than 80% and not more than 90% of the total number of available points
	5	more than 90% of the total number of available points
project (P)	**3**	at least 50% and not more than 60% of the total number of available points
	3,5	more than 60% and not more than 70% of the total number of available points
	4	more than 70% and not more than 80% of the total number of available points
	4,5	more than 80% and not more than 90% of the total number of available points
	5	more than 90% of the total number of available points

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	**Student's workload**	
	Full-time studies	**Extramural studies**
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/		
Participation in lectures	10	
Participation in laboratories/project	20	
Preparation for the exam		
Others		
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/		
Preparation for the lecture	5	
Preparation for the laboratories	30	
Preparation for the exam	10	
Gathering materials for the project		
Preparation of multimedia presentation		
*Others**		
TOTAL NUMBER OF HOURS	**75**	
ECTS credits for the course of study	**3**	

Accepted for execution *(date and signatures of the teachers running the course in the given academic year)*

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