

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Basics of statistics		Code 1010102111010349370
Field of study Civil Engineering Second-cycle Studies	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty Structural Engineering	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: - Laboratory: 15 Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art the sciences Mathematical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: Ewa Bakinowska email: ewa.bakinowska@put.poznan.pl tel. 61 665 2816 Faculty of Electrical Engineering ul. Piotrowo 3A, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Student has a knowledge of combinatorics and probability calculus at the secondary school level. Student has a basic knowledge of Mathematics 1.
2	Skills	Student is able to think logically. Student is able to use a computer.
3	Social competencies	Student understands the necessity of learning and usefulness of acquired knowledge.
Assumptions and objectives of the course: The aim of the course is to familiarize students with selected problems of probability and mathematical statistics. Students acquire the ability to use probabilistic and statistical methods to describe technical issues.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Student knows the basic probability distributions - [K_W01] 2. Student knows the basic terms of mathematical statistics - [K_W01] 3. The student knows different methods of statistical inference. - [K_W01] 4. Student knows the basics of software for statistical computing (R). Student knows the ways of their use in solving technical problems - [K_W01]		
Skills: 1. Student is able to apply theoretical probability distributions. Student is able to analyze and interpret statistical data. Student is able to apply the methods of mathematical statistics in engineering practice. - [K_U013]		
Social competencies: 1. Student understands the usefulness of statistical methods - [K_K01] 2. Student understands the need and know the possibilities of lifelong learning - [K_K06]		
Assessment methods of study outcomes		
Laboratory: written tests Lecture: written test		

Course description		
<p>1. Random variable, distribution function, expected value, variance. 2. Discrete random variable. Discrete distributions. 3. The continuous random variable. Continuous distributions. 4. Point estimation. (Lecture). Confidence intervals. 5. Tests of significance: expected value, variance, proportion (one population). 6. Tests of significance: expected value, variance, proportion (two populations). 7. Analysis of variance. Tests for multiple comparisons (Fisher test, Tukey - test , Dunnett? -test) 8. Pearson correlation coefficients. Linear regression. Testing the significance of regression. 9. Introduction to the environment R. Carry out the above statistical analyses using R.</p> <p>Applied methods of education: - lectures: lecture with multimedia presentation supplemented by examples given on the blackboard Interactive lecture with questions to students Presenting a new topic preceded by a reminder of related content known to students from other subjects - laboratories : use of tools to enable students to perform tasks at home (program R) Presenting a new topic preceded by a reminder of related content known to students from other subjects Update 2018</p>		
<p>Basic bibliography:</p> <p>1. D. Bobrowski, (1986) Probabilistyka w zastosowaniach technicznych, Wydawnictwo Naukowo Techniczne. 2. D. Bobrowski, K. Maćkowiak-Łybacka, (2006) Wybrane metody wnioskowania statystycznego, Wydawnictwo Politechniki Poznańskiej. 3. J. Koronacki, J. Melniczuk (2001) Statystyka dla studentów kierunków technicznych i przyrodniczych. WNT, Warszawa. 4. W. Kordecki (2010) Rachunek prawdopodobieństwa i statystyka matematyczna, Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS. 5. H. Jasiulewicz, W. Kordecki, (2003) Rachunek prawdopodobieństwa i statystyka matematyczna, Przykłady i zadania Oficyna Wydawnicza GiS 6. T. Górecki (2011), Podstawy statystyki z przykładami w R, Wydawnictwo BTC</p>		
<p>Additional bibliography:</p> <p>1. Plucińska A., Pluciński E., Probabilistyka, Wydawnictwo WNT, Warszawa 2. R. L. Scheaffer, J. T. McClave (1995) Probability and Statistics for Engineers, Duxbury</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. participation in lectures	15	
2. participation in laboratory classes	15	
3. participation in the consultations related to the implementation of the education process, (laboratory)	4	
4. completion (own work) reports on laboratory classes	8	
5. prepare for the tests	6	
6. familiarization with the indicated literature / teaching materials	6	
7. preparing to pass the course and participation in completion of lectures: (10 godz. + 2 godz.)	12	
Student's workload		
Source of workload	hours	ECTS
Total workload	66	2
Contact hours	36	2
Practical activities	15	1