STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Probabilistic methods and statistics**		Code **1010334551010344954**
Field of study **Information Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **3 / 5**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**	

No. of hours				No. of credits
Lecture: **20** Classes: **16** Laboratory: **-** Project/seminars: **-**				**5**

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	ECTS distribution (number and %**)**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Well understands the role and the importance of proof in mathematics, as well as the concept of importance of significance. Know the basic claim of the known branches of mathematics. Familiar with the basics of calculus and calculus of functions of one variable and multiple variables, understand how to use in other branches of mathematics.
2	**Skills**	In a way that is understandable, in speech and in writing, to present the correct mathematical reasoning, formulate theorems and definitions, uses the account sentences and quantifiers, correctly use the quantifiers in everyday language, can talk about the mathematical issues understandable, everyday language. He knows how to lead easy and medium difficult evidence method of induction complete; can define functions and recursive relationships
3	**Social competencies**	Familiar with the limitation of their own knowledge and understand the need for further education.

Assumptions and objectives of the course:

- To learn the basic methods for probabilistic and the ability to use them to solve practical engineering problems.
- To use methods and tools of mathematical statistics.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Has knowledge of probability necessary to the description and analysis of the operation and technical systems and fundamental phenomena that occur in them. - [K_W08]

Skills:

1. Uses the term a probability space; can provide various examples of discrete and continuous probability distributions, and discuss selected random experiments and mathematical models in which these timetables; familiar with the practical applications of basic schedules, know how to apply the formula for the conditional probability, total and Bayesian pattern. - [K_U15]

2. Can designate the parameters of the distribution of the random variable with distribution of discrete and continuous; can apply the limit theorem and law of large numbers to estimate probabilities. - [K_U16]

3. He can use the statistical characteristics of the population, knows how to perform simple statistical inference, including the use of computer tools. - [K_U17]

Social competencies:

1. Can accurately formulate questions, to deepen your understanding of the topic or find the missing elements of reasoning, correctly resolves dilemmas associated with the use of the profession. - [K_K02]

2. Understands and appreciates the importance of fairness in the activities of their own and of others; progressed ethically; understand the validity of and understand non-technical aspects and effects of engineering activities, including its impact on the environment and the consciousness of responsibility for decisions. - [K_K04]

Assessment methods of study outcomes

- in terms of lectures:

written exam with theoretical and practical issues,

- in terms of exercises:

written tests (half-and final), continuous assessment activities in the classroom.

Course description

The basic concepts of probability will be discussed i.e.: probability space, different definitions of the probability: axiomatic, geometric, classical, conditional, random variables one and two-dimensional and their probability distributions, elements of descriptive statistics, methods od statistical inference - estimation, hypothesis verification. Simple random sample. The review of basic statistics, their properties and applications in the parameter estimation and the statistical hypotheses testing for one and two populations.

Basic bibliography:

1. Krysicki, Bartos, Dyczka, Krolikowski, Wasilewski - Probability and mathematical statistics in the tasks. I and II. Wydawnictwo PWN, Warsaw, Poland, 2010.

2. Jasiulewicz, Kordecki -   Probability and mathematical statistics. Examples and tasks. Publishing House of the GiS, Wrocław, 2002.

3. Kordecki - Probability and mathematical statistics. Definitions, theorems, formulas. Publishing House of the GiS, Wrocław, 2002.

4. Bobrowski D., Łybacka K. - Wybrane metody wnioskowania statystycznego. Wydawnictwo Politechniki Poznańskiej, Poznań

Additional bibliography:

1. Feller William - Introduction to probability. PWN, T1, 2008, T2 2009.

2. Bobrowski Dobiesław - Probabilistyka in technical applications. WNT, Warszawa 1986.

3. Mirosław Krzyśko - Lectures on probability theory. WNT 2000.

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Participate in exercises	30
3. Prepare for exercise	10
4. Complete (under work) tasks with exercise	10
5. Preparation for the colloquiums with exercise	20
6. Exam preparation of lecture	20

Student's workload

Source of workload	hours	ECTS
Total workload	120	5
Contact hours	60	3
Practical activities	30	2