## STUDY MODULE DESCRIPTION FORM

| Name of the module/subject<br>**Probabilistic methods and statistics** | | Code<br>**1010334551010344954** |
|---|---|---|
| Field of study<br>**Information Engineering** | Profile of study<br>(general academic, practical)<br>**general academic** | Year /Semester<br>**3 / 5** |
| Elective path/specialty<br>**-** | Subject offered in:<br>**Polish** | Course (compulsory, elective)<br>**obligatory** |

| Cycle of study:<br>**First-cycle studies** | Form of study (full-time,part-time)<br>**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)<br>**other** | (university-wide, from another field)<br>**university-wide** |
|---|---|

| Education areas and fields of science and art<br>**the sciences**<br>　　　**Mathematical sciences** | ECTS distribution (number and %**)**<br>**5   100%**<br>　　**5   100%** |
|---|---|

### 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.<br>Know the basic claim of the known branches of mathematics.<br>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.<br>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. The student has a basic knowledge of mathematics including algebra, analysis, logic, probability and elements of discrete mathematics - [K_W01]

#### Skills:

1. The student can obtain information from literature, databases, and other sources; is able to integrate the information obtained, to make their interpretation, as well as draw conclusions and formulate and justify opinions   - [K_U01]

2. The student has the ability to self-education, m. In. In order to improve the professional competence.  - [K_U05]

#### Social competencies:

1. The student understands the need and know the possibilities of continuous training (study the second and third degree, postgraduate courses) - raise their language skills, professional, personal and social. - [K_K01]

2. The student is aware of the validity of behavior in a professional manner, comply with professional ethics and respect for the diversity of views and cultures. - [K_K03]

## 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 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.

Applied methods of education: lectures and exercises.

Lecture supplemented with a multimedia presentation of the supplied examples on the blackboard, during a lecture initiate discussion, take into account the activity of students during class when exposed final evaluation.

Exercises - solving sample tasks on the board and initiating discussion of solutions.

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### 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. - Selected methods of statistical inference. Wydawnictwo Politechniki Poznańskiej, Poznań,2006

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

### Additional bibliography:

1. Plucińska Agnieszka, Edmund Pluciński - Probability, WNT, Warszawa 2000.

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

3. Bobrowski Dobiesław - Probability in technical applications. WNT, Warszawa 1986.

## Result of average student's workload

| Activity | Time (working hours) |
|---|---|
| 1. Participation in lectures | 20 |
| 2. Participate in exercises | 16 |
| 3. Prepare for exercise | 10 |
| 4. Complete (under work) tasks with exercise | 14 |
| 5. Preparation for the colloquiums with exercise | 20 |
| 6. Exam preparation of lecture | 20 |

## Student's workload

| Source of workload | hours | ECTS |
|---|---|---|
| Total workload | 100 | 5 |
| Contact hours | 56 | 3 |
| Practical activities | 44 | 2 |