
Course title: THEORY OF PROBABILITY AND STATISTICS

ECTS credit allocation (and other scores): 7,5

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Natural sciences

Language: English

Number of hours per semester: 45 lectures + 45 classes = 90 hours

Course coordinator/ Department and e-mail: Erasmus coordinator Anna Szczepkowska/ WMil,
erasmuswmii.uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES:

The use of classical and geometrical definition of probability. Conditional probability. Bayes' formula. Probability distribution, discrete distribution function. The density of the probability distribution function of a random variable continuous type. The parameters of random variables. Some probability distributions. Limit theorems and examples of their applications. Determination of confidence intervals for the mean and variation. Verification of statistical hypotheses.

LECTURES:

The concept of probability. Conditional probability and independence of events. Probability total. Bayes' formula. Random variable and its distribution. Distribution parameters. Examples of random variables of discrete type and of the continuous type. The law of large numbers. The central limit theorem. Basic concepts of mathematical statistics. The definition and properties of estimators. Confidence intervals. Parametric tests. Compatibility tests, tests of independence.

LEARNING PURPOSE

The ability to use theorems to solve problems of probabilistic models and statistics to solve typical statistical problems.

On completion of the study programme the graduate will gain:

Knowledge:

The student understands the civilizational importance of mathematics and its applications

The student understands the construction of mathematical theories; can use mathematical formalism to construct and analyze simple mathematical models in other sciences

Skills:

Student uses the notion of probability space; can build and analyze mathematical model random experiment

Student can give various examples of discrete and continuous probability distributions and discuss selected



random experiments and mathematical models in which these distributions are; knows the practical application of basic distributions

Social Competencies:

The student knows the limitations of their knowledge and understands the need for further education

Students can work in teams; understands the need for systematic work on different projects, which are longterm in nature

BASIC LITERATURE

- 1) W. Kryszicki, J. Bartos, W. Dyczka, Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach, wyd. PWN, 1999 ; 2) W. Kordecki, Rachunek prawdopodobieństwa i statystyka matematyczna, wyd. GIS, 2001 ; 3) W. Szlenk, Rachunek prawdopodobieństwa, wyd. WSiPSiA, 2003;
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The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 3,8 ECTS points,

Student's independent work: 3,7 ECTS points,