POZNAN UNIVERSITY OF TECHNOLOGY



EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name

Probability Calculus [S1Bioinf1>RPRAW]

Course			
Field of study		Year/Semester	
Bioinformatics		2/3	
Area of study (specialization)		Profile of study general academi	ic
Level of study first-cycle		Course offered in Polish	n
Form of study full-time		Requirements compulsory	
Number of hours			
Lecture	Laboratory classe	es	Other
30	0		0
Tutorials	Projects/seminars	S	
30	0		
Number of credit points 6,00			
Coordinators		Lecturers	
prof. dr hab. inż. Piotr Formanowie piotr.formanowicz@put.poznan.pl	CZ		
dr hab. inż. Marek Mika marek.mika@put.poznan.pl			

Prerequisites

The student starting this course should have knowledge and skills in the area of discrete mathematics, calculus and linear algebra. Moreover, the student should present such attitudes as: honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, respect for other people.

Course objective

Providing students with basic knowledge in the field of probability. Developing the students" ability to properly perceive random phenomena and their analysis using probability theory methods.

Course-related learning outcomes

Knowledge:

1. The student knows and understands probability theory issues useful for formulating and solving simple bioinformatics problems.

Skills:

1. The student is able to obtain information from literature, databases and other properly selected sources, also in English.

2. The student is able to integrate and interpret the obtained information, as well as draw conclusions and formulate and justify his/her opinions.

Social competences:

1. The student is ready to learn throughout the whole life and improve his/her competences.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

In terms of lectures on the basis of a written exam in the form of a multiple-choice test.

In terms of tutorials on the basis of tests conducted during the semester and the current assessment of students" work.

Programme content

The course covers basic concepts of probablility theory.

Course topics

The lecture covers the following topics:

- 1. Basic concepts of probability theory.
- 2. Probability theory axioms.
- 3. Conditional probability.
- 4. Independence of events.
- 5. Random variables.
- 6. Probability distributions.
- 7. Distribution function.
- 8. Covariance.
- 9. Multidimensional random variables.
- 10. Independent random variables.
- 11. Conditional probability distributions.
- 12. Limit theorems.
- 13. Elements of the theory of stochastic processes.

As part of the tutorials students solve exercises related to the issues discussed during the lectures.

Teaching methods

Lecture: multimedia presentation supplemented with examples given on the blackboard. Tutorials: solving exercises on the blackboard concerning the material presented during lectures, discussion with students on possible ways of solving the exercises.

Bibliography

Basic

1. W. Feller. Wstęp do rachunku prawdopodobieństwa. PWN, Warszawa 2020.

- 2. M. Fisz. Rachunek prawdopodobieństwa i statystyka matematyczna. PWN, Warszawa 1969.
- 3. J. Jakubowski, R. Sztencel. Wstęp do teorii prawdopodobienstwa. Script, Warszawa 2010.

4. A. Plucińska, E. Pluciński. Probabilistyka. WNT, Warszawa 2000.

Additional

1. D. Bobrowski. Probabilistyka w zastosowaniach technicznych. WNT, Warszawa 1986.

2. A. Pacut. Prawdopodobieństwo. Teoria. Modelowanie probabilistyczne w technice. WNT, Warszawa1985.

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,00
Classes requiring direct contact with the teacher	60	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	90	3,00