COURSE DESCRIPTION CARD - SYLLABUS

Course name
Probability Calculus [S1Bioinf1>RPRAW]

Course

Field of study
Bioinformatics

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
0

Other (e.g. online)
0

Tutorials
30

Projects/seminars
0

Number of credit points

6,00

Coordinators

prof. dr hab. inż. Piotr Formanowicz
piotr.formanowicz@put.poznan.pl

dr hab. inż. Marek Mika
marek.mika@put.poznan.pl

Lecturers

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

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