COURSE DESCRIPTION CARD - SYLLABUS

Course name
Statistics and data analysis [N1Inf1>SAD]

Course

Field of study
Computing

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
24

Laboratory classes
16

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge in mathematical analysis, algebra of sets and probability theory

Course objective

The aim of this course is to give the opportunity to learn and discuss basic problems of probability theory and methods of statistical inference. Presented material should give the opportunity to solve selected engineering problems.

Course-related learning outcomes

Knowledge:
1. Student has systematic general knowledge in mathematical statistics, based on theoretical methodology
2. Student knows the most important new directions of the development of mathematical statistics and its achievements
3. Student know basic statistical techniques, methods and tools used in solving problems that appear in informatics

Skills:
1. Student is able to plan and to carry out experiments, including measurements and simulations, to interpret the results and draw conclusions
2. Solving the problems of informatics Student is able to use of respcective statistical methods, including analytical, simulation or experimantal approach

Social competences:
1. Student understands that in informatics the knowledge and skills quickly become obsolete
2. Student is aware of importance of the knowldedge and scientific research in informatics in solving practical problems; knows the examples of malfunctioning systems, that would provide to economic, or social loss; takes responsibility for the reliability of working results and their interpretation

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lectures - written test based on the material presented during the lectures; the student has to collect at least 50% of possible points;
Laboratory classes - test comprising probability theory and mathematical statistics; the student has to collect at least 50% of possible points; the test is scheduled for the last lab in the semester

Programme content

Lectures:
1. Elements of descriptive statistics
2. Random variables (revisited) - basic definitions, cumulative distribution function, expectation and standard deviation probability distributions (binomial and normal),
3. Statistics and their distributions, t-Student distribution, chi-square distribution,
4. Point and interval estimation
5. Testing hypotheses about one or two populations
6. Analysis of variance
7. Correlation and regression analysis

Laboratory Classes:
1. Introduction to R
2. Elements of descriptive statistics
3. Random variables (revisited) - basic definitions, cumulative distribution function, expectation and standard
deviation probability distributions (binomial and normal),
4. Point and interval estimation
5. Testing hypotheses about one or two populations
6. Analysis of variance
7. Correlation and regression analysis

Teaching methods

Lectures (multimedia presentations) - presenting the theory connected with a current students' knowledge, presenting a new topic preceded by a reminder of related content known to students from other subjects
Laboratory classes - solving examples with the use of R package, discussions in groups, applications of statistical methods to solve real problems in groups an individually

Bibliography

Basic
1. Krysicki, W., J. Bartos, W. Dyczka, K. Królikowska and M. Wasilewski: Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach, wydanie 8. PWN Warszawa, 2012
2. Bobrowski, D. and K. Maćkowiak-Łybacka: Wybrane metody wnioskowania statystycznego. Wyd. PP, Poznań, 2004
Additional
1. Devore, J.L.: Probability and Statistics for Engineering and Sciences, Brooks/Cole, 2012
2. Ross, S.M.: Introductory Statistics, Elsevier, 2010

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	40	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	60	2,00