



PROBABILITY AND STATISTICS

General data

Course code:	B19GMK06E
ECTS credits:	7
Type of the course:	core course
Semester:	Spring, Semester 2
Course restrictions:	<i>Basic Excel knowledge is useful</i>
Course leader (with availabilities):	Dániel Kehl, Dr. kehld@ktk.pte.hu +36 72 501 599/ 63144
Further lecturer(s) (with availabilities):	-

1. Description and aims

The module aims to develop a basic understanding in probability theory (discrete and continuous distributions) and basic statistical methods (both descriptive and inferential). It builds a basis in methodology for both theoretical and practical issues in the given field. The module helps to understand ethical questions, concepts of data analysis and methods covered in more advanced statistics courses. Data analytic skills are among the most in-demand jobs nowadays and in the coming years.

2. Intended Learning Outcomes (ILOs)

Upon the successful completion of this course, students should be able to:

1. analyse a population using descriptive statistics (*PILO3*),
2. summarise the key aspects of probability and random variables in the decision-making process (*PILO2*),
3. infer population parameters based on a sample (*PILO3*),
4. solve numerical business problems (*PILO3*),
5. select appropriate techniques and methods for the solution of such problems (*PILO4*),
6. apply theoretical concepts in a business environment (*PILO1*).

(The remarks in brackets express each CILO's connection to the Program Intended Learning Outcomes (PILOs).)

3. Content, schedule

The discussion of topics is divided into the following ten chapters, first 10 chapters of the essential learning material:

1. Introduction
2. Organizing and Visualizing Data
3. Numerical Descriptive Measures
4. Basic Probability
5. Discrete Probability Distributions
6. The Normal Distribution and Other Continuous Distributions



7. Sampling and Sampling Distributions
8. Confidence Interval Estimation
9. Fundamentals of Hypothesis Testing: One-Sample Tests
10. Two-Sample Tests

4. Learning and teaching strategy, methodology

Principal teaching methodologies: pre-reading of book chapter, lecture, in-class discussion, quizzes

This module is delivered via a combination of lectures and practical exercises. Two classes per week in which theory is explained (CILO 1, 2, 3, 5) and applications are demonstrated. An exercise comprising several problems issued at each lecture will form the basis of the follow-up seminars. The seminars extend the students' knowledge of computer programs (primarily Microsoft Excel) to solve business related problems based on the material of the book (CILO 4, 6). A home assignment (CILO 4) is given each week for the students to practice the newly learnt material in form of quizzes. Students are expected to read subchapters before class so they can ask their questions related to the material and we can focus more on problematic concepts (CILO 6).

It is inevitable that students practice on their own based on the exercises and their solutions in the core learning materials. A Forum is provided to have the ability of a panel discussion about the material online on Moodle.

5. Assessment

Formative assessment elements: Oral feedback on in-class activities, discussion of the solution of practical exercises solved during the classes, QA sessions before midterm tests, and drop-in office hours.

Summative assessment elements:

Individual Assessment	100%	Group Assessment	0%
------------------------------	------	-------------------------	----

Name of the element	Weight	Type	Details	Retake opportunity	Req.*	Related CILOs
Midterm 1	20%	Individual written exam	A written exam based on chapters 1-4, containing 3-5 questions.	-	no	1, 2, 4, 5
Midterm 2	20%	Individual written exam	A written exam based on chapters 5-8, containing 3-5 questions.	-	no	2, 3, 4, 5
Weekly assessments	10%	quiz	weekly quizzes (10 x 1%)	-	no	1, 2, 3, 4
Final exam	50%	Individual written exam	A written exam based on chapters 1-10, containing 5-6 questions.	one retake opportunity	yes	1, 2, 3, 4, 5, 6

* Req.: Completion of the element is required to pass the course, irrespective of the performance in other elements.

6. Learning materials

- Essential

BERENSON, M. L., LEVINE, D., SZABAT, K., AND STEPHAN, D. (2019): Basic Business Statistics: Global Edition 14/e, ISBN: 978-0134684840



- Recommended

SHARPE, N. R., DE VEAUX, R. D., VELLEMAN, P. F. (2022): Business Statistics, Global Edition, Pearson, ISBN: 9781292269313

NEWBOLD, P., CARLSON, W. L., THORNE, B. M. (2019): Statistics for Business and Economics, Global Edition, Pearson, 9781292315034

GYIMESI, A, KEHL, D (2021): Relative age effect on the market value of elite European football players: a balanced sample approach, European Sport Management Quarterly, <https://doi.org/10.1080/16184742.2021.1894206>

7. Further information

International aspects embedded with the course
The global edition of the essential learning material contains many international problems. Guest lectures from international faculty if possible.
Ethics, Responsibility & Sustainability (ERS) aspects embedded with the course
Almost all chapters of the essential learning material and all lectures mention ethical considerations and use of statistics.
Connections to the world of practice of the course
Case studies of the essential learning material, course leader shares own consulting and research experiences.