Business Statistics

General data

Course code:	B19GMK08E
ECTS credits:	7
Type of the course:	Core course
Semester:	Fall, Semester 3
Course restrictions:	*It is recommended to finish Probability and Statistics successfully before this course.*
Course leader (with availabilities):	*Mónika Galambosné Tiszberger, Dr.* *tiszbergerm@ktk.pte.hu* *+36 72 501 599/63146*
Further lecturer(s) (with availabilities):	-

1. Description and aims

The module aims to provide students with an understanding of both the theory and practice of Business Statistics. Using the MS Excel as a statistical tool, students will be able to use the special features of a commonly used program and at the same time they will get an overview over the background of the calculations. The main focus of the module is to introduce students to the complex tools of statistics to enable them to research business and management problems in their further studies and work. Students will also be able to understand statistical reports and critically evaluate their content by the end of the course. Ethics and responsible thinking are key in statistics. Data handling, confidenciality issues and ethical reporting of data and results is discussed.

2. Intended Learning Outcomes (ILOs)

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

1. Recognise and define measurement scale of the input variables, recognize statistical problems and match the proper basic methodology (hypothesis test, analysis of stochastic relationships, linear regression model, time series analysis) (PILO2)
2. Describe uncertainty in estimations and hypothesis tests (PILO4)
3. Explain statistical reports and conclusions (PILO4)
4. Solve certain business problems based on data (PILO3)
5. Demonstrate basic statistical terminology (PILO4)
6. Confidently apply Ms Excel as a basic data analysis tool for calculations (PILO3)

(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 main topics (details ont he related core learning material are in the quiz schedule):

1. Recall of descriptive and inferential statistics

2. Analysis of Variance
3. Chi-square test
4. Nonparametric procedures
5. Correlation
6. Simple Linear Regression
7. Multiple Linear Regression
8. Non-linear regression
9. Time series analysis (trends and forecasting)
10. Seasonal changes in time series

4. Learning and teaching strategy, methodology

This module is taught through joint application of theoretical and practical teaching methods, which should enable students to understand mechanisms of business decision making applying statistical methods. To achieve this objective "**flipped classroom**" techniques are applied. Before the lecture the students have to prepare from the coming topic and fill in the online quiz and another quiz after the classes (CILO4, CILO5). (Multiple choice quizes form <20% of the total points.) Feedback on quiz will be given weekly for the class in general and individually if necessary. During the lecture time students work in random groups of 3-4 and work out the guiding questions of the topic (CILO1, CILO2, CILO5). Lecture by the module leader in between is alway shorter than 20 minutes. At the end of the class they also have to solve a group work exercise (CILO3, CILO4) with calculations and conclusions. Feedback is given weekly. At the tutorials in the computer lab the teacher and the students solve the exercises together with MS Excel (CILO4, CILO6). Continuous learning and individual practising is necessary to keep up with the course and ensure successful performance.

Many datasets of the tutorials are based on the research or collection of the module leader. So these are valid, real life examples. International examples mainly included in the time series analysis topics.

A forum is open all along the semester in MS Teams or Moodle to questions and answers.

List of teaching method elements:
- in class discussion
- online quizzes (homework), after and before the class
- one to one consultation
- online tutorials (MS Excel solution videos prepared by the module leader)
- lecturing (<20 minutes)
- in class exercises
- group work
- peer to peer teaching

5. Assessment

Formative assessment elements: Oral feedback on quizzes and group work weekly. Discussion of the solution of practical exercises solved during the classes. Opportunity to individual feedback in office hours.

Summative assessment elements:

Individual Assessment	90%	Group Assessment	10%

Name of the element	Weight	Type	Details	Retake opportunity	Req.*	Related CILOs
Take home assessment	10%	individual quiz (at home)	Multiple choice, T/F quiz in Moodle before and after the topics each week. Open for more days. 12 questions for 12 minutes. It is a readiness/reading assessment.	no retake	no	4, 5
Group work	10%	coursework in groups	Topic related problem solution in 10-15 minutes at the end of each lecture.	no retake	no	2, 3, 4
Midterm tests (2)	2×15% =30	written individual exam	Problem solution with the help of MS Excel. Direct questions. Only numeric solutions are required. 4-5 problems for 50 minutes.	no retake	no	1, 4, 5, 6
Final exam	50%	written individual exam	Problem solution with the help of MS Excel. More complex questions. Interpretation of the results is required beside numeric solutions 5-6 problems for 90 minutes.	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.
Quizzes, group work and midterm tests are required to pass TOGETHER, irrespective of the composition.

6. Learning materials

- Essential

Berenson, M.L. – Levine, D.M. – Szabat, K.A. – Stephan, D. F. (2020): Basic Business Statistics: Concepts and Applications, 14th Global Edition, Pearson

- Recommended

Levine, D.M. – Stephan, D.F. – Szabat, K.A. (2017): Statistics for Managers Using Microsoft Excel, 8th Edition, Pearson
Videos (and belonging datasets) of the lecturer are provided for every exercise type, which guide through the steps of calculations in MS Excel. Students are encouraged to watch these individually and practise the exercise solutions.
As an example of the meaning of responsibility and ethics in statistics, see Galambosné Tiszberger, Mónika: Shadow economy: A comprehensive concept and the interpretation of its size. INTERNATIONAL SOCIAL SCIENCE JOURNAL 72:243 pp. 175-191. 17 p. (2022)
https://doi.org/10.1111/issj.12313

7. Further information

International aspects embedded with the course
Time series analysis topics are illustrated with international examples at the tutorials (international companies like Google, Amazon, Starbucks, etc. source is statista.com) The Global Edition of the textbook is applied. It includes some international examples.
Ethics, Responsibility & Sustainability (ERS) aspects embedded with the course
Ethics and responsible thinking are key in statistics. Data handling, confidenciality issues and ethical reporting of data and results is discussed. Ethical statistical thinking and reporting is discussed in terms of all topics.
Connections to the world of practice of the course
Directly not relevant to this course. An expert of The Central Bank (of Hungary) will have a short introduction of application of regression models in GDP forecasts.