



Applied Statistics and Econometrics

General data

Course code:	M17VZA01E
ECTS credits:	6
Type of the course:	Core course
Semester:	Spring, Semester 3
Course restrictions:	<i>Preferably BAM Business Statistics</i>
Course leader (with availabilities):	<i>Gábor Rappai, Dr. Professor</i> <i>B112 room</i> rappai.gabor@kttk.pte.hu
Further lecturer(s) (with availabilities):	<i>Diána Fűrész, Dr. Assistant professor</i> <i>B112 room</i> furesz.diana@kttk.pte.hu

1. Description and aims

The course gives an overview of major methods regarding empirical work in economics, mostly concentrating on econometric techniques. The methods will be applied to various economic problems, demonstrating their practical applications. Students get hands-on experiences analyzing various economic issues with a variety of approaches. We use SPSS software for practical work. The module aims to deepen the statistical methodology studied at the BSc level and present its special applications in economics and business.

2. Intended Learning Outcomes (ILOs)

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

CILO1. know the basic principles of constructive modelling based on empirical data and the selection procedures used for optimal and economic modeling (PILO4);

CILO2. know the continuous and limited endogenous variable econometric models that can be used to solve the problems of business life and the procedures that enable the examination of the common effect of multiple variables (PILO4);

CILO3. know the correct method for exploring stochastic- and causal relationships and the limitations of causality (PILO3, PILO4, PILO5);

CILO4. collect multivariate primary and secondary data files, clean data with appropriate procedures, and describe and plot them correctly and ethically (PILO3, PILO4, PILO7);



CILO5. choose an appropriate statistical-econometric procedure for examining a given hypothesis and know the conditions and limitations of the methods (PILO4, PILO5);

CILO6. use statistical software that facilitates the application of multivariate regression analysis and applies new methods based on public data (PILO4);

CILO7. perform analytical tasks ethically, furthermore know and wish to avoid bias caused by incorrect data transformation (PILO7);

CILO8. argue supported by professional arguments and represent their opinion responsibly. Taking into account the consequences of the decisions based on it, and at the same time, regardless of the client's intentions (PILO8).

3. Content, schedule

1. Preparing for Multivariate Analysis
2. Review of Descriptive Statistics and Statistical Inference
3. Exploratory Factor Analysis
4. Cluster Analysis
5. Midterm exam
6. Harvard Case Study 1
7. Multivariate Regression
8. MANOVA: Extending ANOVA
9. Discriminant Analysis
10. Logistic Regression: Regression with a Binary Dependent Variable
11. Harvard Case Study 2
12. Univariate Stationary Processes
13. Nonstationary Processes

4. Learning and teaching strategy, methodology

Principal teaching methodologies: lecture, in-class discussion, group work.

This module consists of a combination of lectures and practical exercises. Two classes (2 times 75 minutes) per week in which theory is explained (CILO 1, 2, 3, 5) and applications are demonstrated. The seminars extend the student's statistical software (SPSS) knowledge to solve business-related problems and construct models based on the book's material (CILO 4, 5, 6). The Harvard Case Studies (2 times) supports improving analytical skills by applying statistical and econometrical methods to complex business problems. Students are expected to practice on their own based on the core learning materials during the course. Students receive statistical problems to analyze with SPSS at home during the study period. The lecturer is available for homework-related consultation in class; extra consultation is also possible in addition to the regular office hours.

5. Assessment

Formative assessment elements: Oral feedback on in-class activities; discussion of the solution regarding practical exercises solved during the classes.

Summative assessment elements:

Individual Assessment	80%	Group Assessment	20%
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Name of the element	Weight	Type	Details	Retake opportunity	Req.*	Related CILOs
Midterm	20%	Individual written exam	A written exam based on topics 1-4, containing 3-4 questions.	one retake opportunity	yes	1, 2, 3, 4, 5, 6, 7
Final exam	60%	Individual written exam	A written exam based on topics 1-13, containing 5-6 questions.	one retake opportunity	yes	1, 2, 3, 4, 5, 6, 7
Team presentation	20%	Oral group work	Group work outcome (based on Harvard Case Studies) to be delivered in the form of a presentation.	no	yes	1, 2, 3, 4, 5, 6, 7, 8

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

6. Learning materials

Essential

- Hair, J.F. - Babin, B. J. - Anderson, R. E. - Black, W. C. (2018): Multivariate Data Analysis (Section 1-3.), Cengage.
- Kirchgässner, G. - Wolters, J. - Hassler, U. (2013): Introduction to Modern Time Series Analysis (Chapter 1-2, 5), Springer.

Recommended

- Jarjabka, Á. - Fűrész, D. I. - Havran, Z. (2024): The impact of cultural distance on the migration of professional athletes as high-skilled employees. Journal of Industrial and Business Economics
- Rappai, G. - Fűrész, D. I. (2022): Relationship Between Player Value and Competitive Balance Under the Assumption of Oligopoly. International Journal of Sport Finance, 17(1).
- Stock, J.H. - Watson, M. H. (2020): Introduction to Econometrics, 4th edition.
- Tyrrell, S. (2022): SPSS: Stats Practically Short and Simple.

7. Further information

International aspects embedded with the course
The global edition of the essential learning material contains many international problems. Harvard Case Studies during class.
Ethics, Responsibility & Sustainability (ERS) aspects embedded with the course
Almost all chapters of the essential learning material and all lectures mention ethical considerations and the use of statistics.
Connections to the world of practice of the course
In case studies of the essential learning material, the lecturer shares her consulting and research experiences.



UNIVERSITY OF PÉCS
Faculty of Business and Economics

MSc in Management and Leadership