VISUALIZATION WITH SPREADSHEETS

General data

Course code:	B19GMC14E
ECTS credits:	3
Type of the course:	general elective
Semester:	Fall, Semester 1,3 or 5
Course restrictions:	-
Course leader (with availabilities):	Ferenc Kruzslicz, Dr. kruzslic@ktk.pte.hu +36 72 501 599/ 23113
Further lecturer(s) (with availabilities):	-

1. Description and aims

This course allows participants to gain practical experience with chart design and corresponding VBA through a series of practice sessions and problem-solving workshops. The instructor will take students through various learning outcomes and then consolidate each laboratory work with hands on examples whereby students can utilize the tools provided and apply them in various decision making and programming situations. It is discussed also why how good ethical practices play in designing visualisation. The course starts with learning how to use advanced charting tools of Excel, then goes on to learn to write VBA programs to help in professional modelling and visualization. VBA is important even in financial industry, because its integration into Microsoft Office, especially Excel. Generally knowing how to design beautiful charts is a definite advantage for your future career.

2. Intended Learning Outcomes (ILOs)

Upon the successful completion of this course, students should be able to:
1. Understand and analyse business models, written in well-structured Excel. (PILO1)
2. Preprocess data of different types with advanced spreadsheet techniques and evaluate the role data issues (quality, errors) in decision making, research and investigations. (PILO3)
3. Find proper visualization method for management decisions problems and produce high quality, dynamic charts and effective data summaries. (PILO4)
4. Adjudge visualization quality of charts and graphical data representation. (PILO3)
5. Demonstrate management with Excel as a DSS applications using large, complex datasets. (PILO3)
6. Solve business problems by using a wide range of advanced Excel functions, objects and VBA. (PILO2)

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

3. Content, schedule

1. Introducing charts in Excel: Creating and editing charts and templates

2. Customizing charts: Elements and formatting, series and markers
3. Charts with trends: Trendline, forecasting, scatter matrix
4. Charts of differences: Component comparison, waterfall charts
5. Charts of relationships: Paired matching, correlation, radar charts
6. Stock analysis charts: Data structure, OHLC and candlestick charts
7. Advanced chart techniques: Dynamic charts with scrolling
8. Pivot charts: Data cubes and pivoting, filtering and OLAP operators
9. Visualization without charts: Ascii art, conditional formatting, data bars
10. Maps, shapes and graphs: Geographical data plot, smart art
11. Introduction to VBA: Woking with elements of chart objects
12. Advanced charting with VBA: Interactive, dynamic charts, exporting

4. Learning and teaching strategy, methodology

Principal teaching methodologies: Hands on practices based on chapter prereading

This module has a practical focus. Every week a new concept is introduced and discussed (CILO1, CILO3). Teaching method is a case and example-based problem-solving using computer related best practice technologies (CILO2, CILO4, CILO6). Reading the reference books, accompany with exercises, gives you further learning possibilities. Weekly data visualization challenges are announced as optional homeworks (CILO5). All materials and instructions are available on the digital learning environment.

5. Assessment

Formative assessment elements: Optional weekly home works to reproduce charts created by professionals. Solutions are voted, shared and best ones are discussed with in-class demonstration.

Summative assessment elements:

Individual Assessment	100%	Group Assessment	0%

Name of the element	Weight	Type	Details	Retake opportunity	Req.*	Related CILOs
Home works	0%	Individual case	Reproduction of a professional chart example of the chapter	No retake	no	1,4,5
Midterm 1 exam	50%	Individual exam	Computer exam about basic charts of chapters 1-6	One retake opportunity	yes	1,2,3
Midterm 2 exam	50%	Individual exam	Computer exam about advanced charts based on chapters 7-14	One retake opportunity	yes	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

B. Jelen: Charts and Graphs: Microsoft Excel (2007/2010/2013),

Que, 2007, ISBN: 9780789736109, p. 480

- Recommended

M. Alexander, J. Walkenbach: Excel Dashboards and Reports (1st or 2nd ed),
Wiley, 2010, ISBN: 9781118257500, p. 456

7. Further information

International aspects embedded with the course
A short introduction is included into number, date and currency format localization methods. Giving examples how different chart types are preferred and used in different countries
Ethics, Responsibility & Sustainability (ERS) aspects embedded with the course
One chapter covers ethics of how to avoid visual misleading and false communication. Considering how to develop charts in order to make them readable for persons with disabilities, colour blindness and visually impaired persons.
Connections to the world of practice of the course
Real world examples and dataset are used to illustrate common tasks and basic skills. A special topic is included for stock market visualizations.