

Syllabus

1. Programme information

1.1. Institution	THE BUCHAREST UNIVERSITY OF ECONOMIC STUDIES
1.2. Faculty	Economic Cybernetics, Statistics and Informatics
1.3. Departments	Department of Statistics and Econometrics
1.4. Field of study	Cybernetics and statistics
1.5. Cycle of studies	Master Studies
1.6. Education type	Full-time
1.7. Study programme	Applied data analytics
1.8. Language of study	English
1.9. Academic year	2025-2026

2. Information on the discipline

2.1. Name	Data Visualisation Techniques								
2.2. Code	25.0318IF1.2-0004								
2.3. Year of study	1	2.4. Semester	2	2.5. Type of assessment	Exam	2.6. Status of the discipline	O	2.7. Number of ECTS credits	6
2.8. Leaders	C(C)	prof.univ.dr. MARIN I ERIKA					erika.marin@csie.ase.ro		
	S(S)	prof.univ.dr. MARIN I ERIKA					erika.marin@csie.ase.ro		

3. Estimated Total Time

3.1. Number of weeks	14.00
3.2. Number of hours per week	4.00 of which
	C(C) 2.00
	S(S) 2.00
3.3. Total hours from curriculum	56.00 of which
	C(C) 28.00
	S(S) 28.00
3.4. Total hours of study per semester (ECTS*25)	150.00
3.5. Total hours of individual study	94.00
<i>Distribution of time for individual study</i>	
Study by the textbook, lecture notes, bibliography and student's own notes	14.00
Additional documentation in the library, on specialized online platforms and in the field	28.00
Preparation of seminars, labs, assignments, portfolios and essays	34.00
Tutorials	16.00
Examinations	2.00
Other activities	

4. Prerequisites

4.1. of curriculum	Basic Statistics
4.2. of competences	Statistical Software - Excel

5. Conditions

for the C(C)	The lectures will be held in rooms with Internet access and multimedia teaching equipment
for the S(S)	The seminars will be conducted in rooms with computers which have appropriate software: Excel, Tableau, Power BI

6. Acquired specific competences

PREFESSIONAL	CC1	Digital skills – advanced use of software tools and platforms, development of software applications on different platforms.
PREFESSIONAL	CC2	STEM (science, technology, engineering, mathematics) skills – understanding the mathematical foundations of AI, statistical methods of data analysis applied in AI techniques.
PREFESSIONAL	CO4	Conducts quantitative research
PREFESSIONAL	CP3	Performs data analysis
PREFESSIONAL	CT2	Thinks through the use of logic and reasoning for identifying the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.
PREFESSIONAL	CT3	Lists simple instructions for a computer system to solve problems or perform tasks at a basic level, with appropriate guidance if necessary.

7. Objectives of the discipline

7.1. General objective	<p>Preparing students to use dedicated softwares in data visualisation in order to identify trends, patterns, relationships between variables and exploratory analysis of data sets as tools in the decision making process</p> <p>Understanding the importance and role of visualization in data analysis in the decision-making process.</p> <p>Understanding the components of a visualization and choosing the right type of graph depending on the characteristics of the data set, the type of audience and the established objectives.</p> <p>Creating and presenting interactive dashboards in different data visualization software</p>
7.2. Specific objectives	<p>Knowledge:</p> <p>C2: Deep understanding of the processes of data collection, processing, analysis and interpretation in economic, social and industrial contexts, as well as the integration of interdisciplinary knowledge (data science, machine learning, advanced visualization).</p> <p>C3: Acquisition of knowledge about accessing data from different sources and handling large volumes of data.</p> <p>Skills:</p> <p>A2: Application of exploratory and predictive data analysis techniques, including time series analysis, spatial econometrics and big data, with the purpose of substantiating strategic decisions in public and private organizations.</p> <p>Responsibility and autonomy:</p> <p>RA1: Capacitatea de a conduce proiecte analitice complexe și de a lua decizii statistice autonome în condiții de incertitudine, cu respectarea principiilor etice și de protecție a datelor.</p> <p>RA3: Dezvoltarea continuă a competențelor profesionale în conformitate cu dinamica tehnologică și a mediului de business</p>

8. Contents

8.1. C(C)		Teaching/Work methods	Recommendations for students
1	<p>Introduction to data visualization</p> <ul style="list-style-type: none"> - Importance and role of data visualization. - Evolution of data visualization - Elements of graphic representations. <p>[C2,C4,A2] [2h]</p>	Lecture based on multimedia presentations and interaction with students.	Lecture 1. Class notes online.ase.ro

2	Basics of data visualization - Main types of graphical representations. [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 2. Class notes online.ase.ro
3	Data visualisation using Microsoft Excel. -Understanding the several types of charts in Excel. -Design principles in Excel [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 3. Class notes online.ase.ro
4	LookUp functions and Pivot tables used in creating a Dashbord in Excel. [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 4. Class notes online.ase.ro
5	Creation of an interactive Dashbord in Excel. [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 5. Class notes online.ase.ro
6	Introduction in Power BI . Data flows Understanding the Interface Basic working principles in Power BI [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 6. Class notes online.ase.ro
7	Power BI – part 2 Creation of interface Constructiin charts Particularities of charts preseting distributions, associations, trends [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 7. Class notes online.ase.ro
8	Constructing a dashbord in Power BI. Use of Slicer Use of Filter pane and other instruments used in creating an interactive dashboard in Power BI [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 8. Class notes online.ase.ro
9	Exploratory Data Analysis and Visual Analytics -Principles of visual perception -Attributes used in visual perception -Choosing the optimal graph according to the characteristics of the data set. - Data exploration facilities using visual representation. [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 9. Class notes online.ase.ro
10	Design principles and best practices in visual representation -Design principles -Strategic use of colour -Esthetical elements in data visualization [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 10. Class notes online.ase.ro
11	Dashboards -Principles for creating effective dashboards -Best practices and errors to avoid in creating dashboards. [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 11. Class notes online.ase.ro
12	Dashboards -Creating dashboards in Tableau. Examples Cluster Analysis using Tableau [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 12. Class notes online.ase.ro
13	Detecting errors in graphical representations. [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	Lecture 13. Class notes online.ase.ro
14	Integration of visualisation techniques [C2,C4,A2] [2h]	Lecture based on multimedia presentations and interaction with students.	recapitulation

Bibliography

- Few, S, Information dashboard design: The effective visual communication of data, O'Reilly Media, Inc., 2006, Statele Unite ale Americii
- Tufte, E. R., McKay, S. R., Christian, W., & Matey, J. R., Visual explanations: Images and quantities, evidence and narrative, 1998, Statele Unite ale Americii

- Tableau web site, <http://www.tableau.com/academic/teaching/university-of-washington>
- Microsoft, Power BI, <https://learn.microsoft.com/en-us/power-bi/fundamentals/desktop-get-the-desktop>
- Marin Erika, Note de curs - Data Visualization Techniques, class notes, online.ase.ro

8.2. S(S)		Teaching/Work methods	Recommendations for students
1	Introduction in data visualization [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 1. Class notes online.ase.ro
2	Creating the main types of graphs [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 2. Class notes online.ase.ro
3	Data visualisation using Microsoft Excel. Applications in -Understanding the several types of charts in Excel. -Design principle in Excel [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 3. Class notes online.ase.ro
4	LookUp functions (VlookUp, HlookUp) and Pivot tables and charts used in creating a Dashbord in Excel. [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 4. Class notes online.ase.ro
5	Creation of an interactive Dashbord in Excel based on a multidimensional databases. [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 5. Class notes online.ase.ro
6	Introduction in Power BI . Data flows Understanding the Interface Basic working principles in Power BI [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 6. Class notes online.ase.ro
7	Power BI – part 2 Creation of interface Constructiin charts Particularities of charts preseting distributions, associations, trends [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 7. Class notes online.ase.ro
8	Constructing a dashbord in Power BI. Use of Slicer. Use of Filter pane and other instruments used in creating an interactive dashboard in Power BI [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 8. Class notes online.ase.ro
9	Introduction in Tableau. Main types of graphs in Tableau. Creating new variables using the “if” function. Case study: Business products/orders database. [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 9. Class notes online.ase.ro
10	Using new calculated fields and parameters. Creating a control chart. Creating a synthesis visualization using Tableau functionalities Special types of graphs: Word Cloud; Bubble Map [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 10. Class notes online.ase.ro
11	Creating a dashboard using Tableau Using the interactive features of dashboards in Tableau: actions and filters. Case Study: Creating a dashboard for the Business products/orders database. [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 11. Class notes online.ase.ro
12	Dashboards Case Study: Human Resources Database [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 12. Class notes online.ase.ro
13	Project Presentation. [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	Lecture 13. Class notes online.ase.ro
14	Project Presentation. [C2,C4,A2,RA1,RA3] [2h]	Applications and Case Studies in specialized visualisation software	

Bibliography

- <https://learn.microsoft.com/en-us/power-bi/fundamentals/desktop-get-the-desktop>
- Tableau web site, <http://www.tableau.com/academic/teaching/university-of-washington>
- Marin, Erika, nOTEDE CURS - Data Visualization Techniques, class notes, online.ase.ro

9. Corroboration of the contents of the discipline with the expectations of the representatives of the epistemic community, of the professional associations and representative employers in the field associated with the programme

The proposed course and seminar topics are consistent with national and international literature, as well as employers' requirements both in terms of theoretical knowledge and software packages used.

10. Assessment

Type of activity	Assessment criteria	Assessment methods	Percentage in the final grade
10.1. C(C)	Active participation	Recording of answers and participation in discussions	5.00
10.2. S(S)	Active participation	Recording of answers and participation in discussions	5.00
10.3. S(S)	PROJECT	Project presentation/ Oral evaluation	30.00
10.4. Final assessment	Written exam	Written exam	60.00
10.5. Modality of grading	Whole notes 1-10		
10.6. Minimum standard of performance	Project presentation Grade of minimum 5 (out of 10) to be obtained from project evaluation Carrying out a project using either POWER BI or TABLEAU in which exploratory or predictive analysis techniques are applied to create a DASHBOARD.		

Date of listing,
04/28/2026

Signature of the discipline leaders,

Date of approval in the
department

Signature of the Department Director,