

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 Economic Informatics and Cybernetics
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 Management for Data Science								
2.2. Code	25.0318IF1.1-05.2								
2.3. Year of study	1	2.4. Semester	1	2.5. Type of assessment	Test	2.6. Status of the discipline	A	2.7. Number of ECTS credits	6
2.8. Leaders	C(C)	conf.univ.dr. BELCIU Anda					anda.velicanu@ie.ase.ro		
	S(S)	conf.univ.dr. CORBEA D ALEXANDRA-MARIA-IOANA					Alexandra.corbea@ie.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	30.00		
Additional documentation in the library, on specialized online platforms and in the field	18.00		
Preparation of seminars, labs, assignments, portfolios and essays	30.00		
Tutorials	7.00		
Examinations	7.00		
Other activities	2.00		

4. Prerequisites

4.1. of curriculum	Databases, Web Technologies, Programming
4.2. of competences	Use methods and techniques regarding advanced databases analysis, design and implementation.

5. Conditions

for the C(C)	The lectures will be held in rooms with Internet access and multimedia teaching equipment
for the S(S)	<ul style="list-style-type: none"> The seminars take place in rooms with internet access and the computers can connect to the Oracle Database server The following products are installed: Oracle SQL Developer.

6. Acquired specific competences

PREFESSIONAL	CC1	Digital skills – advanced use of software tools and platforms, development of software applications on different platforms.
PREFESSIONAL	CP2	Uses of data processing techniques
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.
PREFESSIONAL	CT5	Assumes the need for continuous training to create the premises for career progression and adapts one's own professional and managerial skills to the dynamics of the economic environment.

7. Objectives of the discipline

7.1. General objective	Students gain knowledge of modern technologies on advanced database systems for data science
7.2. Specific objectives	<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>RA1: Ability to lead complex analytical projects and make autonomous statistical decisions under uncertainty, in compliance with ethical and data protection principles.</p> <p>RA3: Continuous development of professional skills in accordance with technology trends and business environment.</p>

8. Contents

8.1. C(C)		Teaching/Work methods	Recommendations for students
1	Introduction to databases Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[4] Chap 1 pp 11-23
2	Relational databases Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[4] Chap 3 pp 63-75
3	Other types of databases Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[4] Chap 6 pp 105-114
4	NoSQL Databases Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[5] Chap 24 pp 883-910

5	DBMS, fundamental concepts Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[5] Chap 2 pp 31-56
6	Functions, architecture and classifying DBMS Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[5] Chap 2 pp 31-56
7	Relational DBMS, characteristics, mechanisms, characterizing PL/SQL Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[2]
8	Advanced database systems Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[5] Chap 26 pp 961-1018
9	The data block, transactions, properties of transactions Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[1] Chap 15 pp 443-446
10	Spatial databases Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[5] Chap 26 pp 987-993
11	The relational model and the SQL standard Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[3] [4] Chap 4 pp 79-85
12	SQL procedural extensions, fundamental control structures, advantages and disadvantages of using stored procedures, packages and triggers Expected learning outcomes: C2, C3	Lecture based on multimedia presentations and interaction with students. (2h)	[3] [1] Chap 9 pp 277-288
13	Summary (RA1, RA3)	Lecture based on multimedia presentations and interaction with students. (2h)	
14	Evaluation (RA1, RA3)	Lecture based on multimedia presentations and interaction with students. (2h)	

Bibliography

- C.J. Date , [1] An introduction to database systems, Addison Wesley, 2004
- [2] Database PL/SQL Language Reference, <https://docs.oracle.com/en/database/oracle/oracle-database/21/lnpls/index.html>
- [3] SQL Language Reference, <https://docs.oracle.com/en/database/oracle/oracle-database/21/sqlrf/>
- A. Belciu, [4] Introduction to Databases, ASE Bucuresti, 2016, România
- R.Elmasri, S.Navathe, [5] Fundamentals of database systems, 7th edition,, Pearson, 2016, Statele Unite ale Americii

8.2. S(S)		Teaching/Work methods	Recommendations for students
1	Introduction Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[1]
2	Advanced SQL Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[1]
3	Advanced SQL Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[1]
4	Advanced SQL Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[1]
5	Advanced SQL – project presentation (RA1, RA3)	Practical demonstrations, case studies (2h)	
6	Oracle spatial Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[3] Chap 1 pp 1-27
7	Oracle spatial Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[3] Chap 2 pp 1-34
8	Oracle spatial Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[3] Chap 4 pp 1-19
9	Oracle spatial - project presentation (RA1, RA3)	Practical demonstrations, case studies (2h)	
10	Oracle APEX Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[2]
11	Oracle APEX Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[2]
12	Oracle APEX Expected learning outcomes: RA1, RA3	Practical demonstrations, case studies (2h)	[2]
13	Oracle APEX - project presentation (RA1, RA3)	Practical demonstrations, case studies (2h)	
14	Late project presentations (RA1, RA3)	Practical demonstrations, case studies (2h)	

Bibliography

- [1] SQL Language Reference, <https://docs.oracle.com/en/database/oracle/oracle-database/21/sqlrf/>
- [2] APEX Documentation, <https://apex.oracle.com/en/learn/documentation/>
- Chuck Murray et al., [3] Oracle® Spatial User's Guide and Reference , Oracle Corporation, 2002, https://docs.oracle.com/cd/B10501_01/appdev.920/a96630.pdf

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 content of the course is consistent with what is taught in other universities in the country and abroad. For a better adaptation to the labor market needs and requirements, will be held meetings with experts in the field of databases, representatives of Oracle Romania and other prestigious IT companies, but also with teachers of computer sciences/ databases from Romanian universities dedicated data centers.

10. Assessment

Type of activity	Assessment criteria	Assessment methods	Percentage in the final grade
10.1. C(C)	- the obtained grade; -activity during classes (about 5 attendances), responding to questions, ideas, suggestions etc	- the written verification test on PC; - points for classes activity (+ or -)	50.00
10.2. S(S)	Defending the three projects	The average of the three project grades	50.00
10.3. Final assessment			
10.4. Modality of grading	Whole notes 1-10		

10.5. Minimum standard of performance	At least, the student should know: - The current trends regarding the integrated technologies into database systems - To make at least two of the projects using the studied products
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Date of listing,
04/28/2026

Signature of the discipline leaders,

Date of approval in the
department

Signature of the Department Director,