

**COURSE DESCRIPTION****1. Information about the programme**

1.1 Institution of higher education	Alexandru Ioan Cuza University of Iasi
1.2 Faculty	Faculty of Economics and Business Administration
1.3 Department	Department of Accounting, Information Systems and Statistics
1.4 Field of study	Business Informatics
1.5 Level	Master
1.6 Study programme/ Qualification	Software Development and Business Information Systems

2. Information about the course

2.1 Course name	Database Administration						
2.2 Course coordinator	Associate Prof. Cătălin Strîmbei, Ph.D.						
2.3 Seminar coordinator	Ionuț HRUBARU, George Daniel TALABĂ						
2.4 Year of study	I	2.5 Semester	II	2.6 Type of assessment	E	2.7 Discipline status	E

* C – Compulsory / E - Elective

3. Total estimated time (hours allocated to didactic activity per semester)						
3.1 Total number of hours per week	3	of which: 3.2 lecture	1	3.3 seminar/lab	2	
3.4 Total number of hours in the curriculum	42	of which: 3.5 lecture	14	3.6 seminar/lab	28	
Time distribution						hours
Study of the handbook, coursebook, bibliography and notes						30
Additional research in the library, online and on the field						15
Preparation of seminars/labs, homeworks and projects						40
Tutorials						15
Assessment						8
Other activities.....						
3.7 Total number of self-study hours						108
3.9 Total number of hours per semester						150
3.10 Number of credits						6

4. Prerequisites (if applicable)

4.1 curriculum-based	<ul style="list-style-type: none"> Databases (or similar)
4.2 competence-based	<ul style="list-style-type: none"> SQL

5. Conditions (if applicable)

5.1. for lectures	<ul style="list-style-type: none"> Lecture rooms shall be provided with video projector
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5.2. for seminars/labs	<ul style="list-style-type: none"> IT services of the faculty will provide a real or virtual machine with Oracle Database Server Students are invited to bring and use their own laptops with Database Server (Oracle DB), SQL Developer Labs will have enough computers for students not owning a laptop Lab computers will have installed a real or virtual machine Oracle DB Server and Oracle SQL Developer Tool
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6. Assimilated specific competences

Professional competences	<ul style="list-style-type: none"> C2.2 Selection and refinement of the methods and techniques for data modeling, persistence, query and analysis, according to the nature of problems and available resources (3) C2.3 Assess the degree of information integrity and validity for organizational data; find the appropriate tools for administration and analysis of business data (2) C4.5 Write the specifications and deploy the modules regarding data, applications and services integration (0.5)
Transversal competences	<ul style="list-style-type: none"> CT3 – Continuous improvement of specific skills and knowledge towards approaching information systems, development of new software technologies and management of information systems. (0.5)

7. Discipline objectives (provided by the assimilated specific competences grid)

7.1 The general objective of the discipline	<ul style="list-style-type: none"> To provide the core knowledge, methodologies and tools in order to create optimized physical database schemas and to implement security and availability assurance policies and strategies.
7.2 Specific objectives	<ul style="list-style-type: none"> Knowledge of database servers internal architecture. Knowledge of and skills to design optimal database storage structures. Knowledge and skills to audit and tune database server activity parameters. Knowledge and skills for implementing business rules regarding security and backup&recovery requirements.

8. Content

8. 1 Lecture	Teaching methods	Observations
Chapter 1. Database System Architecture 1.1 Overview on DBMSs/Database Servers Functional and Organization structures 1.2 Oracle DBMS Specific Structural Features: instance and background processes, SQL processing	Course lecture, explanation, conversation, questioning.	4 hours (2 lectures)





1.3 Oracle DBMS Specific Structural Features: tablespaces, segments, extents and data blocks 1.4 Oracle DBMS Specific Structural Features: indexes types and storage 1.5 Oracle DBMS Specific Structural Features: tables, partitioning and storage		
Chapter 2. SQL Database Physical Design 2.1 Goals and objectives of database physical design 2.2 Database Design Process: macro process and micro process 2.3 Physical Design principles and decisions: Query execution plan and index design 2.3 Physical Design principles and decisions: table storage design 2.3 Physical Design principles and decisions: de-normalization techniques	Course lecture, diagrams, explanation, conversation, questioning. Case study.	6 hours (3 lectures)
Chapter 3. Database System Transactions and Concurrency 3.1 Transactional support structures 3.2 Applying ACID principles on database systems 3.3 Oracle blocking options 3.4 Pluggable Database and DBaaS	Course lecture, code execution, explanation, conversation, questioning. Case study.	4 hours (2 lectures)
8. 2 Seminar/lab	Teaching methods	Observations
T1. Oracle Database Server Setup	Practical Case Study	2 labs
T2. The Oracle Instance and the Physical Schema	Practical Case Study	2 labs
T3. Oracle Database Tuning	Practical Case Study	2 labs
T4. Oracle Database Security and Auditing	Practical Case Study	2 labs
T5. Oracle Database Backup and Recovery	Practical Case Study	2 labs
T6. Oracle Container DB and Cloud	Practical Case Study	2 labs
T7. DBA Project Evaluation	Discussion, Individual Practical Project-final stage	2 labs
Bibliography		
Craig S. Mullins, <i>Database Administration: the complete guide to practices and procedures</i> , Second Edition, Addison-Wesley, 2013 Thomas Kyte and Darl Kuhn, <i>Expert Oracle Database Architecture</i> , Third Edition, Apress, 2015 Lahdenmaki, Tapio, Leach, Michael, <i>Relational database index design and optimizers: DB2, Oracle, SQL server et al</i> , John Wiley & Sons, 2005		





Bob Bryla, Kevin Loney *Oracle Database 11g DBA Handbook*, (Oracle Press), McGraw-Hill Osborne Media, 2008
 Harrison, Guy, *Oracle performance survival guide: a systematic approach to database optimization*, Prentice Hall, 2009
 Allen, Grant, Bryla, Bob, Kuhn, Darl, *Oracle SQL Recipes: A Problem-Solution Approach*, Apress, 2009
 Caffrey, Mellanie et.al. *Expert Oracle Practices: Oracle Database Administration from the Oak Table*, Apress, 2010
 Tony Hasler, *Expert Oracle SQL Optimization, Deployment, and Statistics*, Apress, 2014
 Christian Antognini, *Troubleshooting Oracle Performance*, Apress, 2014
 Robert G. Freeman, Matthew Hart, *Oracle RMAN 11g Backup and Recover*, 2010, The McGraw-Hill Companies, Inc. (Publisher)
 Paul Wright, *Protecting Oracle Database 12c*, 2014 Apress
 Fotache, Marin, Strîmbei, Cătălin, Crețu, Liviu *Oracle9i2: dezvoltarea aplicațiilor profesionale*, Polirom 2004
 Date, C.J. *An introduction to Database Systems Eighth Edition*, Addison-Wesley 2004
 Connolly, Thomas M., Begg, Carolyn E. *Database systems: a practical approach to design, implementation and management, third edition*, Addison-Wesley Pearson Education Lmt., 2002
 Fotache, Marin *Proiectare bazelor de date: normalizare și postnormalizare, implementări SQL și Oracle*, Polirom 2005

9. Corroboration of the discipline content with the expectations of epistemic community representatives, professional associations as well as of representative employers in the programme related field.

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10. Assessment

Type of activity	10.1 Assessment criteria	10.2 Assessment methods	10.3 Share of final grade
Project	<ul style="list-style-type: none"> The physical schema Tuning Security and Backup-Restore 	Real-world application, complexity, validity	75%
Exam		Quiz Test	25%
10.6 Minimum performance standard			
<ul style="list-style-type: none"> Minim 5 for the final grade. 			

Date of completion Lecture Coordinator
Assoc.Prof. Cătălin Strîmbei, Ph.D.

Seminar Coordinators
Ionuț HRUBARU,
George Daniel TALABĂ

Date of approval within the department

Head of Department
Prof. Florin Dumitriu, Ph.D.

