Syllabus

Course Description

Course Title	Database Management Systems
Course Code	76213
Course Title Additional	
Scientific-Disciplinary Sector	INFO-01/A
Language	German
Degree Course	Bachelor in Computer Science
Other Degree Courses (Loaned)	
Lecturers	Prof. Johann Gamper, Johann.Gamper@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/748
Teaching Assistant	
Semester	Second semester
Course Year/s	2
CP	6
Teaching Hours	40
Lab Hours	20
Individual Study Hours	90
Planned Office Hours	
Contents Summary	Based on the concepts gained in the introductory database course, students will develop a deeper understanding of how database management systems work. Specifically, students will learn basic and advanced techniques and methods used in database management systems to store and index data, to efficiently process concurrent user queries and to keep the data safe and consistent.
Course Topics	- Physical data storage - Indexing and hashing - Query processing and optimization

	- Transaction processing - Concurrency control - Recovery
Keywords	Database management systems, index structures, query optimization, transactions, concurrency control
Recommended Prerequisites	The course requires knowledge of relational databases (including SQL and relational algebra), algorithms, and programming skills. This material is taught in the following courses: Introduction to Databases, Data Structures and Algorithms, Introduction to Programming.
Propaedeutic Courses	
Teaching Format	The course includes frontal lectures, exercises, and lab exercises.
Mandatory Attendance	Attendance to the course and the labs is not compulsory, but generally recommended to maximize the learning effect. The exam modalities for attending and non-attending students are the same.
Specific Educational Objectives and Learning Outcomes	Knowledge and Understanding - D1.4 Understand the key principles, the structures and the organization of relational databases and methods for designing and developing databases. - D1.9 Know in detail the principles of relational database systems and methods for designing, developing and optimizing databases. Applying knowledge and understanding - D2.13 Be able to develop efficient and optimized applications based on relational databases Ability to make judgments - D3.1 Be able to collect and interpret useful data and to judge information systems and their applicability. - D3.2 Be able to work autonomously according to the own level of knowledge and understanding. Communication skills - D4.1 Be able to use one of the three languages English, Italian and German, and be able to use technical terms and communication appropriately. Learning skills

	- D5.1 Have developed learning capabilities to pursue further studies with a high degree of autonomy. - D5.3 Be able to follow the fast technological evolution and to learn cutting edge IT technologies and innovative aspects of last generation information systems.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	The assessment for the course consists of a single written exam at the end of the term. The exam includes verification questions, transfer-of-knowledge questions, and exercises. Verification questions are used to assess learning outcomes related to knowledge and understanding, while transfer-of-knowledge questions and exercises evaluate the ability to apply that knowledge in practical contexts.
Evaluation Criteria	The written exam counts 100% of the grade. The exam is evaluated according to the following criteria: clarity, completeness and correctness of answers.
Required Readings	Abraham Silberschatz, Henry Korth, and S. Sudarshan. Database System Concepts. McGraw-Hill Science/Engineering/Math, Boston, 5th edition, May 2005. ISBN 978-0-07-295886-7.
Supplementary Readings	Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer D. Widom. Database Systems: The Complete Book. Pearson College Div, Upper Saddle River, N.J, 2th edition, 2008. ISBN 978-0-13-187325-4.
Further Information	- PostgreSQL (https://www.postgresql.org) - PgAdmin (https://www.pgadmin.org)
Sustainable Development Goals (SDGs)	Quality education