Fakultät für Ingenieurwesen
Facoltà di Ingegneria
Faculty of Engineering

COURSE DESCRIPTION – ACADEMIC YEAR 2024/2025

Course title	**Modeling and Databases with Project**
Course code	76445
Scientific sector	ING-INF/05
Degree	Bachelor in Informatics and Management of Digital Business (L-31)
Semester	2
Year	1
Credits	12
Modular	Yes

Total lecturing hours	80
Total lab hours	40
Attendance	Not compulsory. Non-attending students should contact the lecturers at the beginning of the course in order to get indications on how to best follow the course.
Prerequisites	Students should have a solid mathematical foundation and be familiar with the basic programming concepts.
Course page	https://ole.unibz.it/

Specific educational objectives	The course belongs to the type "attività formative di base – formazione informatica di base". Students attending this course will study and put into practice languages, methodologies, and techniques for modelling data, business processes and decisions that are instrumental to the creation of information systems supporting contemporary organizations in their operations management. In addition, they will be able to translate a data model into a corresponding database, and learn how to make use of the basic functionalities (definition, update, and querying) of database management systems in the context of development and deployment of information systems. The course focuses specifically on relational databases, the SQL language, and software programs accessing them, but the taught methods and principles are of a more general nature, and can be applied also in those contexts where data models and database systems different from relational ones are adopted.

Module 1	**Data and Process Modeling for Business Informatics**
Module code	76404A
Module scientific sector	ING-INF/05
Lecturer	Marco Montali
Contact	Office B1.5.03, Faculty of Engineering, NOI Techpark, Via Bruno Buozzi 1, marco.montali@unibz.it, +39 0471 016116
Scientific sector of lecturer	ING-INF/05
Teaching language	English
Office hours	Announced on the webpage of the course and of the lecturer.
Lecturing assistant (if any)	--
Contact LA	--
Office hours LA	--

Credits	6
Lecturing hours	40
Lab hours	20
List of topics	• Introduction to Business Process Management • Data modeling • Descriptive process modeling • Analytic process modeling • Decision modeling
Teaching format	Frontal classroom lectures plus exercises.

Module 2	**Introduction to Databases for Business Informatics**
Module code	76404B
Module scientific sector	INF/01
Lecturer	Davide Lanti
Contact	Office B1.5.06, Faculty of Engineering, NOI Techpark, Via Bruno Buozzi 1, lanti@inf.unibz.it
Scientific sector of lecturer	INF/01
Teaching language	English
Office hours	Announced on the webpage of the course and of the lecturer.
Lecturing assistant (if any)	--
Contact LA	--
Office hours LA	--
Credits	6
Lecturing hours	40
Lab hours	20
List of topics	• Relational Model • Query languages (relational algebra and SQL) • Query management • Database design • Building database applications • NoSQL and large-scale data management
Teaching format	Frontal classroom lectures plus exercises.

Learning outcomes	Knowledge and understanding: • D1.4 - Understand the key principles and modeling structures of data and processes. • D1.5 - Know the main foundations of relational database systems and methods of designing, developing and optimising such systems. Applying knowledge and understanding: • D2.4 - Ability to formalise and to analyse procedures and operational processes, to recognise and use optimisation potentials. • D2.7 - Ability to plan and use access to (relational) databases. Communication skills • D4.5 - Ability to collaborate in interdisciplinary teams to achieve IT objectives. Learning skills

	• D5.3 - Ability to follow rapid technological developments and to learn about innovative aspects of the latest generation of information technology and systems.

Assessment	• Project work to test knowledge application skills and communication skills, done in small groups to present their work written and orally. • Written exam with verification questions and questions to test knowledge application skills.
Assessment language	English
Assessment Typology	Monocratic
Evaluation criteria and criteria for awarding marks	• 40% project work • 60% written exercises Relevant for assessment of Module 1: ability to work in teams, skill in applying knowledge in a practical setting, ability to summarize in own words. Relevant for assessment of Module 2: clarity of answers, ability to recall principles and methods used in database systems, skill in applying knowledge such as developing and querying databases.

Required readings	• Raghu Ramakrishnan, Johannes Gehrke. Database Management Systems. 3rd edition. McGraw-Hill, 2005. • Dumas, M., La Rosa, M., Mendling, J. and Reijers, H. A.: Fundamentals of Business Process Management (II edition). Springer, 2018. Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it
Supplementary readings	
Software used	PostgreSQL Database Management System