

## COURSE DESCRIPTION – ACADEMIC YEAR 2023/2024

<b>Course title</b>	<b>Modeling and Databases</b>
<b>Course code</b>	76404
<b>Scientific sector</b>	ING-INF/05
<b>Degree</b>	Bachelor in Informatics and Management of Digital Business (L-31)
<b>Semester</b>	2
<b>Year</b>	1
<b>Credits</b>	12
<b>Modular</b>	Yes

<b>Total lecturing hours</b>	80
<b>Total lab hours</b>	40
<b>Attendance</b>	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.
<b>Prerequisites</b>	Students should have a solid mathematical foundation and be familiar with the basic programming concepts.
<b>Course page</b>	<a href="https://ole.unibz.it/">https://ole.unibz.it/</a>

<b>Specific educational objectives</b>	<p>The course belongs to the type "attività formative di base – formazione informatica di base".</p> <p>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.</p>
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<b>Module 1</b>	<b>Data and Process Modeling for Business Informatics</b>
<b>Module code</b>	76404A
<b>Module scientific sector</b>	ING-INF/05
<b>Lecturer</b>	<a href="#">Marco Montali</a>
<b>Contact</b>	Office POS 2.01, <a href="mailto:marco.montali@unibz.it">marco.montali@unibz.it</a> , +39 0471 016116
<b>Scientific sector of lecturer</b>	ING-INF/05
<b>Teaching language</b>	English
<b>Office hours</b>	Announced on the webpage of the course and of the lecturer.
<b>Lecturing assistant (if any)</b>	--
<b>Contact LA</b>	--
<b>Office hours LA</b>	--
<b>Credits</b>	6

<b>Lecturing hours</b>	40
<b>Lab hours</b>	20
<b>List of topics</b>	<ul style="list-style-type: none"> <li>• Principles of data modeling</li> <li>• Data modeling with ER and UML</li> <li>• Relational mapping</li> <li>• Descriptive process modeling</li> <li>• Analytic process modeling</li> <li>• Decision modeling</li> </ul>
<b>Teaching format</b>	Frontal classroom lectures plus exercises.

<b>Module 2</b>	<b>Introduction to Databases for Business Informatics</b>
<b>Module code</b>	76404B
<b>Module scientific sector</b>	INF/01
<b>Lecturer</b>	<a href="#">Davide Lanti</a>
<b>Contact</b>	Office POS 2.06, <a href="mailto:lanti@inf.unibz.it">lanti@inf.unibz.it</a>
<b>Scientific sector of lecturer</b>	INF/01
<b>Teaching language</b>	English
<b>Office hours</b>	Announced on the webpage of the course and of the lecturer.
<b>Lecturing assistant (if any)</b>	--
<b>Contact LA</b>	--
<b>Office hours LA</b>	--
<b>Credits</b>	6
<b>Lecturing hours</b>	40
<b>Lab hours</b>	20
<b>List of topics</b>	<ul style="list-style-type: none"> <li>• Relational Model</li> <li>• Query languages (relational algebra and SQL)</li> <li>• Query management</li> <li>• Database design</li> <li>• Building database applications</li> <li>• NoSQL and large-scale data management</li> </ul>
<b>Teaching format</b>	Frontal classroom lectures plus exercises.

<b>Learning outcomes</b>	<p>Knowledge and understanding:</p> <ul style="list-style-type: none"> <li>• D1.4 - Understand the key principles and modeling structures of data and processes.</li> <li>• D1.5 - Know the main foundations of relational database systems and methods of designing, developing and optimising such systems.</li> </ul> <p>Applying knowledge and understanding:</p> <ul style="list-style-type: none"> <li>• D2.4 - Ability to formalise and to analyse procedures and operational processes, to recognise and use optimisation potentials.</li> <li>• D2.7 - Ability to plan and use access to (relational) databases.</li> </ul> <p>Communication skills</p> <ul style="list-style-type: none"> <li>• D4.5 - Ability to collaborate in interdisciplinary teams to achieve IT objectives.</li> </ul> <p>Learning skills</p> <ul style="list-style-type: none"> <li>• D5.3 - Ability to follow rapid technological developments and to learn about innovative aspects of the latest generation of information technology and systems.</li> </ul>
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<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Project work to test knowledge application skills and communication skills, done in small groups to present their work written and orally.</li> <li>• Written exam with verification questions and questions to test knowledge application skills.</li> </ul>
<b>Assessment language</b>	English
<b>Assessment Typology</b>	Monocratic
<b>Evaluation criteria and criteria for awarding marks</b>	<ul style="list-style-type: none"> <li>• 40% project work</li> <li>• 60% written exercises</li> </ul> <p>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.</p> <p>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.</p>
<b>Required readings</b>	<ul style="list-style-type: none"> <li>• Raghu Ramakrishnan, Johannes Gehrke. Database Management Systems. 3<sup>rd</sup> edition. McGraw-Hill, 2005.</li> <li>• Dumas, M., La Rosa, M., Mendling, J. and Reijers, H. A.: Fundamentals of Business Process Management (II edition). Springer, 2018.</li> </ul> <p>Subject Librarian: David Gebhardi, <a href="mailto:David.Gebhardi@unibz.it">David.Gebhardi@unibz.it</a></p>
<b>Supplementary readings</b>	
<b>Software used</b>	PostgreSQL Database Management System