

Syllabus

Course description

Course title	Design and Development of Business Software
Course code	47559 / 76090
Scientific sector	ING-INF/05
Degree	Master in Industrial Mechanical Engineering / Master SEIS LM-18
Semester	2
Year	1
Academic year	2021/2022
Credits	5
Modular	no

Total lecturing hours	32 + 8 optional (for Master SEIS LM-18)
Total lab and exercise hours	16 + 8 optional (for Master SEIS LM-18)
Attendance	Not mandatory but strongly recommended
Recommended preliminary knowledge	-
Connections with other courses	-
Course page	https://www.unibz.it/en/faculties/sciencetechnology/master-industrial-mechanical-engineering/

Specific educational objectives	<p>The aim of the course is to teach students about the most advanced solutions in the field of business software, grasping the essential elements through the study of the evolution of systems, to understand the evolutionary dimension of information systems and thus be able to interact with system engineers, both in the most advanced as well as in traditional contexts.</p> <p>At the end of the course students will know how to design an information system, creating comprehensive project documentation to be implemented by computer scientists and will know how to design and implement small solutions for their own use.</p>
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Lecturers	Prof. Cortolezzis Daniele Dr. Melegati Goncalves Jorge Augusto
Scientific sector of the lecturers	ING-INF/05
Teaching language	English
Office hours	12 hours + 9 hours
Teaching assistant (if any)	-
Office hours	-

<p>List of topics covered</p>	<ul style="list-style-type: none"> • Introduction to Business Processes • Basic Tools for Business Software Design and Development <ul style="list-style-type: none"> - Spreadsheets - The Internet and Applications for Business - Fundamentals of Database and Relational DB • Database Design and Implementation <ul style="list-style-type: none"> - Conceptual Schemas - Logical Schemas - DBMS Languages for design, querying and manipulation - Distributed databases and evolutionary trends in information organization (big data, cloud computing, blockchain, and security) - • The Enterprise and its Business Processes <ul style="list-style-type: none"> - Operational processes - Management processes - Government processes • Transactional systems (OLTP) for business processes <ul style="list-style-type: none"> - Formal Languages to describe processes - Fundamentals of programming languages for implementing OLTP • Enterprise applications <ul style="list-style-type: none"> - ERP: Enterprise Resource Planning - CRM: customer relationship management - Supply Chain Management - E-commerce • Business Intelligence, Dashboards and Online Analytical Processing (OLAP) • Software Lifecycle • Case studies on Advanced Solutions (<i>optional</i>) <ul style="list-style-type: none"> - NAMS: Digital Marketplace for Additive Manufacturing - Systems for Digital Supply Network and Digital Twins Management
<p>Professional applications of the covered topics</p>	<p>The student will be able to play a driving role in the development of information systems, in relation to the processes in which he/she is involved, knowing the techniques of analysis and design of information systems and being familiar with the most advanced technological solutions, albeit at a high level.</p>

Teaching format	Frontal lessons and Case Studies Exercises								
Learning outcomes (ILO)	<p>The learning outcomes need to refer to the Dublin Descriptors:</p> <p>1. Knowledge and understanding:</p> <p>a. Students will be able to understand what an information system is, what its ICT components are, what factors enable their evolutions, and what trends are most popular nowadays.</p> <p>b. Students will know the basic and most common tools for implementing personal information systems using databases or spreadsheets</p> <p>2. Applying Knowledge and understanding:</p> <p>a. Students will be able to describe a business process, modify it and redesign the components of an information system involved in the change</p> <p>b. Also, students will be able to implement simple solutions through a spreadsheet or a commercial database</p> <p>3. Making judgments:</p> <p>Thanks to a comparative approach to the study of information systems in different business contexts, students will be able to understand the innovation degree of a solution and how to drive an innovative process towards more advanced solutions, enabled by emerging IC technologies.</p> <p>4. Communication skills:</p> <p>Students will acquire the ability to draw up the design of an information system (or the redesign of one of its components), using a formal and correct language, comprehensible to those who will then have to physically implement the solution.</p> <p>5. Learning skills</p> <p>Students acquire the ability to autonomously extend the knowledge on the topics of the course, applying them in different industrial context.</p>								
Assessment	<table border="1"> <thead> <tr> <th data-bbox="639 1890 850 1962">Form</th> <th data-bbox="850 1890 1212 1962">Length /duration</th> <th data-bbox="1212 1890 1404 1962">ILOs assessed</th> </tr> </thead> <tbody> <tr> <td data-bbox="639 1962 850 2098">Writing</td> <td data-bbox="850 1962 1212 2098">3 h</td> <td data-bbox="1212 1962 1404 2098">1.a - 2.a 1.b - 2.b - 3 4</td> </tr> </tbody> </table>			Form	Length /duration	ILOs assessed	Writing	3 h	1.a - 2.a 1.b - 2.b - 3 4
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	<table border="1"> <tr> <td>Lab exercises</td> <td>1.b - 2.b - 3 - 5</td> </tr> </table>	Lab exercises	1.b - 2.b - 3 - 5
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	<p>Labs exercises are mandatory and correspond to 33% of the final mark. In case of a positive mark for the lab exercises, the mark will count for the remaining regular exam sessions of the academic year. In case of negative evaluation of the exercises, a new version needs to be submitted for the next session.</p>		
Assessment language	English		
Evaluation criteria and criteria for awarding marks	<p>The final mark will be the sum of three components: (ILO 1.b – 2.b) – ability to solve simple problems, creating and managing solutions through spreadsheets and database – max 11 pts. (ILO 4.) – ability to design / redesign a component of an information system, using correct key terms and semantic representation of information – max 11 pts. (ILO 1.a – 2.a - 3) – ability to dissertate on information system’s organisation and management, ICT components and infrastructures, trends and key factors on technological evolutions – max 11 pts.</p>		
Required readings	Laudon, K. C., Laudon, J. P., Management Information Systems: Managing the Digital Firm (17th Edition) Pearson Education		
Supplementary readings	<p>Elmasri, Navathe, Fundamentals of Database Systems, Global Edition (7th Edition), Pearson Education</p> <p>Sinha A., Bernardes E., Calderon R., Wuest T., Digital Supply Network, McGraw Hill</p> <p>Magal, R. S., Word, J. (2009): Essentials of business processes and information systems, Wiley, New York</p>		