



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2023/2024
MASTER'S DEGREE (MSC)	COMPUTER ENGINEERING
SUBJECT	WEB SYSTEMS DESIGN AND ARCHITECTURE
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50369-Ingegneria informatica
CODE	21500
SCIENTIFIC SECTOR(S)	ING-INF/05
HEAD PROFESSOR(S)	LA CASCIA MARCO Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	96
COURSE ACTIVITY (Hrs)	54
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	LA CASCIA MARCO Monday 15:00 17:00 Microsoft Teams Codice: wztkv0u

PREREQUISITES	Basic knowledge of HTML and CSS. Java programming skills. Knowledge of relational DB and SQL language. Basic knowledge of TCP/IP protocol stack.
LEARNING OUTCOMES	- Knowledge and understanding The student will acquire knowledge about web application architecture and design and related technologies both client-side and server-side. To achieve this goal, the course will include: lectures; class discussions about existing web applications and analysis of sample code. - Applying knowledge and understanding The student will be able to design and implement simple web applications and to work in team under the supervision of a senior developer. To achieve this goal, the course will include sessions in classroom discussing code and autonomous writing of simple applications. - Making judgements The student will acquire the capabilities to evaluate different technologies and choose the most appropriate for the project at hand. To achieve this goal the course will include: analysis and discussion of case studies; analysis of several technologies with focus on advantages and disadvantages of their use. - Communication skills The student will acquire the skills needed to discuss problems related to web application architectures and design and effectively interact with teammates and customers. To achieve this goal the course include sessions where students explain how they solve the assignments and the difficulties encountered. - Learning skills The student will be able to deepen autonomously the topics of the course and understand advanced books and documentation. To achieve this goal the course include: exercises to solve autonomously; discussion on difficulties encountered.
ASSESSMENT METHODS	The final grade will be expressed out of thirty and will vary from 18/30 to 30/30 with honors. The exam consists of a written test (in a computer lab) in which the candidate will be asked to design a complete application, using the technologies presented in the course, starting from the textual description of the problem. The written test also includes the implementation of some of the modules of the designed application. Students who obtain at least a sufficient evaluation in the written test will then be able to access the oral test which will focus on all the topics of the course. Students who deliver the exercises (which will essentially be parts of a complete web application) within the times established by the teacher will be able, instead of the written test, to present the web application resulting from the integration of the delivered exercises and directly access the oral exam. According to the Dublin descriptors, the expected results will be assessed in relation to the final grade as follows: - from 18/30 to 20/30: mediocre or sufficient knowledge and understanding of the topics covered in the class, partial ability to apply the acquired knowledge to solve the proposed problems; partial autonomy of judgment, communication skills and the ability to learn. - from 21/30 to 23/30: sufficient or discrete knowledge and understanding of the topics covered, sufficient ability to apply the knowledge acquired for the resolution of the proposed problems, sufficient independence of judgment, communication skills and ability to learn. - from 24/30 to 26/30: discrete knowledge and understanding of the topics covered, discrete ability to apply the knowledge acquired for the resolution of the proposed problems, sufficient autonomy of judgment, communication skills and the ability to learn. - from 27/30 to 30/30 cum laude: good or excellent knowledge and understanding of the topics covered, good or excellent ability to apply the acquired knowledge for the resolution of the proposed problems, good or excellent judgment autonomy, enables communicative and ability to learn. The minimum requirement for passing the exam is the demonstrated knowledge, in the two tests, of the technologies used in web applications, both from the front-end and back-end point of view, and how these integrate with each other.
EDUCATIONAL OBJECTIVES	The goal of the course is the study of web technologies and possible web applications architectures. We will discuss XML language and techniques for validation, manipulation, presentation and transformation. Front-end technologies will be presented referring to HTML, CSS, Javascript and the document object model of XML (DOM). AJAX technology will also be discussed. The jQuery library will be outlined including animations and AJAX support. Back-end technologies based on Java, JDBC, Servlet, JSP, MVC approach and the Spring framework will be reviewed in some detail. Spring security will also be introduced. Based on the technologies studied possible web applications

	architecture will be shown. Finally, version control systems and build tools will be introduced as well as the steps needed to deploy a web application on the most popular cloud platforms.
TEACHING METHODS	Lectures, practical sessions implementing web application parts.
SUGGESTED BIBLIOGRAPHY	Note fornite dal docente.

SYLLABUS

Hrs	Frontal teaching
2	Web application basic architecture: client-server model, web services.
2	HTML language. Introduction to CSS.
4	"Introduction to XML: structure of an XML document, XML tree, namespace XML, XML applications. XML validation: regular expressions, DTD (Document Type Definition), XML Schema. XPath. XSL transformation (XML Stylesheet Language)."
6	Javascript core language: variable, type, control flow, predefined object, string, array, date. Javascript events. DOM manipulation in Javascript. AJAX: using XMLHttpRequest, response handling. Exchanging data using JSON and XML. jQuery library.
4	Introduction to JAVA EE: Servlet, JSP. MVC approach.
4	Data persistence in Java. Brute force approach (JDBC). Object oriented architecture and relational databases. ORM.
6	Introduction to Spring Boot. Spring security.
2	Source version control systems. Build tools. Deploying on cloud platforms.
2	Wrap-up
Hrs	Practice
2	HTML/CSS pages.
4	XML and XML validation.
4	Javascript and jQuery pages.
4	Endpoints for AJAX requests.
4	Server components accessing a DB.
4	Implementation of access control.