



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Ingegneria
<b>ACADEMIC YEAR</b>	2017/2018
<b>BACHELOR'S DEGREE (BSC)</b>	CIVIL AND BUILDING ENGINEERING
<b>SUBJECT</b>	BUILDING TECHNIQUES OF HISTORICAL ARCHITECTURE
<b>TYPE OF EDUCATIONAL ACTIVITY</b>	B
<b>AMBIT</b>	50110-Architettura e urbanistica
<b>CODE</b>	18080
<b>SCIENTIFIC SECTOR(S)</b>	ICAR/10
<b>HEAD PROFESSOR(S)</b>	VINCI CALOGERO      Professore Associato      Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	
<b>CREDITS</b>	6
<b>INDIVIDUAL STUDY (Hrs)</b>	96
<b>COURSE ACTIVITY (Hrs)</b>	54
<b>PROPAEDEUTICAL SUBJECTS</b>	
<b>MUTUALIZATION</b>	
<b>YEAR</b>	3
<b>TERM (SEMESTER)</b>	1° semester
<b>ATTENDANCE</b>	Not mandatory
<b>EVALUATION</b>	Out of 30
<b>TEACHER OFFICE HOURS</b>	<b>VINCI CALOGERO</b> Tuesday 15:00 17:00 Dipartimento di Architettura - Edificio 8 - 2° piano - Stanza 40 Thursday 15:00 17:00 Dipartimento di Architettura - Edificio 8 - 2° piano - Stanza 40

<p><b>PREREQUISITES</b></p>	<p>The Degree Course not have in its study declaration any propaedeutic teaching.</p>
<p><b>LEARNING OUTCOMES</b></p>	<p><b>KNOWLEDGE</b>                  The student will acquire awareness of the major issues regarding the historical building system.                  In detail:  <ul style="list-style-type: none"> <li>• he/she will examine the various components of the traditional building technological system (classes of technological units, technological units; materials and components of traditional buildings);</li> <li>• starting from a general overview (building and environment, building construction systems, general principles of the construction process/design), the lessons will be referred initially to traditional building techniques and materials.</li> <li>• the student will acquire a wide range of technology possibilities (due to the variety of materials and constructive techniques) and also he/she can understand the continuous changing needs, often regulated by technical progress of traditional construction system.</li> </ul> <p>At the end of the course, the student will dispose of conceptual, methodological and operational notions and knowledge which will allow him/her to synthetically develop an appropriate evaluation and analysis of an historical building.</p> <p><b>CAPACITY 'TO APPLY KNOWLEDGE AND UNDERSTANDING</b>                  The course aims to develop into the student mind, mainly through the theoretical lessons, the under listed capacities:  <ul style="list-style-type: none"> <li>• apply what learned through an evaluation of different design conditions, making choices targeted to specific application cases as regards traditional constructive solutions;</li> <li>• understand the evolution of building systems, the problems linked to the compatibility of building materials, the potential ambits of the traditional building techniques.</li> </ul> <p><b>AUTONOMY OF JUDGEMENT</b>                  After completing the course, the student will develop specific critical skills in:  <ul style="list-style-type: none"> <li>• identification of the most relevant solutions in traditional/historic construction.</li> <li>• understanding, by analogy and differentiation, such as the issues of the intervention design on historical construction did not offer standardized solutions, but the design activity require an autonomous capacity of interpretation as regard the environmental parameters and the choice of technical solutions too;</li> <li>• understanding of own specific professional profile with respect to the range of skills that are required to address in an integrated way the issues of historical building design and construction methods.</li> </ul> <p><b>COMMUNICATION ABILITIES</b>                  During the lessons, the design exercise and eventually some specific seminars, the student is stimulated to:  <ul style="list-style-type: none"> <li>• interact with its interlocutors (colleagues, professors) to develop its capacity for dialogue on general and specific topics.</li> <li>• adopt from time to time the most effective communication tools in a modern interpretation of the future engineering profession.</li> </ul> <p><b>LEARNING ABILITY</b>                  During the course                  the student will be able to:  <ul style="list-style-type: none"> <li>• develop learning skills useful to relate the topics of the course even with past and future teachings, learned or that he/she will learn during his/her degree course.</li> </ul> </p> </p></p></p></p>
<p><b>ASSESSMENT METHODS</b></p>	<p>Oral exam, concerning questions about the course topics.</p> <p><b>CRITERIA USED FOR EVALUATION:</b>                  The oral exam consists of a conversation, in order to check the skill and the knowledge of the topics of the course; the final evaluation of the exam will be expressed in thirtieths.</p> <p>The oral questions will focus mainly on these contents:  <ul style="list-style-type: none"> <li>• the course themes debated during the lessons, with a particular attention to the acquired knowledge, the elaboration capacity and the possession of an adequate exposition capacity;</li> </ul> <p>The final evaluation will globally deal with the theoretical knowledge.</p> <p>About the check of the knowledge, to the student will be requested:  <ul style="list-style-type: none"> <li>• skill of the theoretical topics;</li> </ul> <p>About the check of the elaborated capacities pertinent to the theoretical part of</p> </p></p>

	<p>the course, the student will obtain the achievement at least of two objectives among these:</p> <ul style="list-style-type: none"> <li>•understanding of the application/implications of the examined topics; ability to exactly place the contents inside the system (technological or environmental), inside the technological units class, a single technological unit class; ability to argue and distinguish the materials and traditional construction systems;</li> <li>•ability to place the subject content of the course within the vast professional and technological context, regulatory reference;</li> <li>•critical synthesis and comparisons between theoretical topics.</li> </ul> <p>About the check of the reasoning and narrative buildup capability, the student will obtain the achievement of these objectives:</p> <ul style="list-style-type: none"> <li>•technical language knowledge, adequate to the acquired knowledge and the professional engineering context;</li> </ul>
<b>EDUCATIONAL OBJECTIVES</b>	<p>The teaching and learning goals are the acquisition of knowledge for the analysis and characterization of the historic buildings preparatory to the restoration.</p> <p>The student, in particular, will acquire knowledge of:</p> <ul style="list-style-type: none"> <li>•contents related to the historical construction, set to the architectural scale, reaching a synthesis of knowledge able to activate a complex and integrated approach to intervention design;</li> <li>•contents inherent the production, realization of construction materials and related traditional construction techniques;</li> </ul>
<b>TEACHING METHODS</b>	Frontal lessons (54 hours).
<b>SUGGESTED BIBLIOGRAPHY</b>	<p>Menicali U., I materiali dell'edilizia storica: tecnologia ed impiego dei materiali tradizionali, La Nuova Italia scientifica, Roma, 1992</p> <p>Di Pasquale S., L'arte del costruire. Tra conoscenza e scienza, Marsilio, Venezia, 1996</p>

## SYLLABUS

Hrs	Frontal teaching
25	Materials widely used in historic building (natural and artificial stone, wood, mortar, plaster and stucco, metal, glass, ...), with particular reference to the architecture of Sicily. The natural stones. Lithogenesis, types and recognition, extraction systems in quarry, processing systems and formats, identifying specific cases in parts of the historic buildings. The artificial stone. Brick: production systems, used in the old site. Building mortars, plasters and stucco: the material and the methods' packaging. The wood and its use in architecture. The material, technical features. The iron in construction and steel structures: material (iron, steel and cast iron) and features. The glass.
4	Evolution of building techniques (processing and packaging systems, mode 'of use and installation, replacement and / or integration, ...), understanding and knowledge of technical terminology, advancement and improvement of technologies, through the testing of materials and construction techniques held over the centuries "innovative". Treatises, manuals and construction technique. Architecture and ways of building through the direct and indirect sources.
25	Evolution of the construction process: the project and the protagonists of the historical building construction; the new construction and the reconfiguration project, extension; transformations and changes, and related change of traditional building character, integration and compatibility between the old and new building systems; integrations and material replacements. Relations between geometry, form and structure. The historical building techniques: Construction principles. Heavy systems. Pillars and columns, Trilith. Masonry. Pushing systems. Geometry and construction of arches and vaults. Use of natural and artificial stone and various construction techniques in monuments from different historical periods: walls. Evolution over the centuries of construction techniques. Arches, vaults, domes. Evolution over the centuries of construction techniques. Building mortars, plasters and stucco: uses in the historical shipyard. The wood and its use in architecture. Structural elements construction techniques: foundation piles, columns and pillars, beams, lintels, masonry timbered ceilings, trusses, furniture finishing and completion: light dividers, vaulted ceilings and floor. Evolution over the centuries of construction techniques. The iron in construction and steel structures: construction systems (floors, pillars, trusses, arches, roofs, etc.). Evolution over the centuries of construction techniques. The nineteenth century and the discovery of architecture iron-vitreous; review of cases and building techniques. The discovery of the concrete and its uses in architecture