UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2018/2019
BACHELOR'S DEGREE (BSC)	CIVIL AND BUIDING ENGINEERING
SUBJECT	TECHNICAL ARCHITECTURE
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50110-Architettura e urbanistica
CODE	01463
SCIENTIFIC SECTOR(S)	ICAR/10
HEAD PROFESSOR(S)	VINCI CALOGERO Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	9
INDIVIDUAL STUDY (Hrs)	144
COURSE ACTIVITY (Hrs)	81
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**VINCI CALOGERO** 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

DOCENTE: Prof. CALOGERO VINCI

PREREQUISITES	The Degree Course not have in its study declaration any propaedeutic teaching. Being able to follow the course without any problems and with the necessary skills, the student should have acquired at least the following pre-required knowledge: •free-hand drawing and computer tools;
LEARNING OUTCOMES	KNOWLEDGE The student will acquire awareness of the major issues regarding the building system, broken down into "technological system" and "environmental system". In detail: • he/she will examine the various components of the building technological system (classes of technological units, technological units; materials and components of traditional buildings; materials and components of contemporary buildings); • 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, focusing in the second part of the course particularly to contemporary materials and constructive techniques; • the student will be accompanied in the understanding of the environmental spaces that constitute the building structure and performance, that have to satisfy the demands of users; • the student has available 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 or normative system (environmental and technological), referring to the performances that each building system have to meet. At the end of the course, the student will dispose of conceptual, methodological and operational/executive/normative notions and knowledge which will allow him/her to synthetically develop an appropriate design solution, in which the adopted technological solutions will be compatible with the environmental requirements. CAPACITY 'TO APPLY KNOWLEDGE AND UNDERSTANDING The course aims to develop into the student mind, mainly through the theoretical lessons, the under listed capacities: •apply what learned through an evaluation of different design conditions, making choices targeted to specific application cases, both as regards traditional constructive solutions that evolved ones; • understand the evolution of building systems, the problems linked to the compatibility of building materials, the potential ambits both of the traditional building techniques that of evolved ones. After the illustration of spaces that make up the building structure and of the different classes of technological units and the related requirements (environmental and technological) and doing a design exercise, the student will be stimulate to: •develop a specific capacity to apply traditional and contemporary materials and building techniques to the design of a simple building organism, in respect and satisfaction of users needs and of environment. In particular, the design exercise aims to: • facilitate the students to deal with a concrete professional event, which will cross the typological analysis phases, the analysis of normative references and the use of the most suitable materials and construction techniques. The course, including visits to construction building sites and construction industries, will favourite a best and more immediate understanding of the building construction process, activating a chance to see applied the knowledge gained in real executive cases. AUTONOMY OF JUDGEMENT After completing the course, the student will develop specific critical skills in: • identification of the most relevant solutions related to the various situations in which the design and construction of a building operate. •understanding, by analogy and differentiation, such as the issues of the building design did not offer standardized solutions, but rather the design activity require an autonomous capacity of interpretation as regard the environmental parameters and the choice of technical solutions; • 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 building design and construction methods. COMMUNICATION ABILITIES During the lessons, the design exercise and eventually some specific seminars,

	the student is stimulated to: •interact with its interlocutors (colleagues, professors) to develop its capacity for dialogue on general and specific topics; • present, at progressive steps, the results reached during the design exercise and thus to argue in a critical way his/her analysis activities and to discuss the adopted design solutions. • adopt from time to time the most effective communication tools in a modern interpretation of the future engineering profession, in addition to appropriate and actually used graphical representations, multimedia presentations and contemporary graphics programs for building design LEARNING ABILITY During the course the student will understand: •the theoretical and conceptual subjects and the normative ambit related to the discipline, which should be progressively updated with respect to the cultural and scientific debate and the evolution of technology, as well as the research of new materials and the needs increasingly targeted at energy and environmental parameters; •the need of a continuous updating of knowledge, useful to maintain good levels of competence and professionalism, through a plurality of bibliographic references. Through the frequent dialogue established with the professor during the lessons, the exercise time and the exposition of doubts and question during the clarification time, the student will be able to: •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. .
ASSESSMENT METHODS	Oral exam, concerning questions about the course topics and the presentation/ discussion of the design building project. CRITERIA USED FOR EVALUATION: 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. The oral questions will focus mainly on these contents: •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; •presentation (in all its constituent parts) and discussion of the building design developed during the assigned exercise, with a particular attention to evidence the own and significant contribution to the group work, to the well description of the design in autonomy and to a good argumentation, using an adequate properties of language; ability to refer the course content to the practical aspects of the design exercise. The final evaluation will globally deal with the theoretical knowledge and the assessment of the building design elaborated by the student. About the check of the knowledge, to the student will be requested: •skill of the theoretical topics; •skill of the graphical tools and the design contents, indicated during the group exercise. About the check of the elaborated capacities pertinent to the theoretical part of the course, the student will obtain the achievement at least of two objectives among these: •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 construction systems, both traditional that contemporary; •ability to place the subject content of the course within the vast professional and technological context, regulatory reference; •critical synthesis and comparisons between theoretical topics. About the check of the capacities pertinent to the building assigned design, the student will obtain the achievement at least of two objectives among these: •ability to expose the design and apply the content of the course to the same design; •ability to favour relationship between the other components of the design group (group work); •predisposition to autonomy of work, with a resolution capability of the assigned problems; capacity of critical judgment about the course contents.

	About the check of the reasoning and narrative buildup capability (both in the theoretical content of the assigned design exercise), the student will obtain the achievement of these objectives: •technical language knowledge, adequate to the acquired knowledge and the professional engineering context; •full skill of general and detailed design capabilities.
EDUCATIONAL OBJECTIVES	The teaching and learning goals are the acquisition of knowledge about the technological system, consisting of classes of technological units, classes of technical elements and technical elements, aimed at the design of simple building structures, using materials and construction techniques of the contemporary . The student, in particular, will acquire knowledge of: •contents related to the design, set to the architectural scale, reaching a synthesis of knowledge able to activate a complex and integrated approach to architectural design; •contents inherent the production, realization of construction materials and related construction techniques; •contents inherent the sustainable design of the building envelope and of the different technical elements that can contribute to sustainability and energy savings.
TEACHING METHODS	Frontal lessons (53 hours) and a design exercise, carried out into teamwork groups of students directly linked to the design of a single family residence (28 hours).
SUGGESTED BIBLIOGRAPHY	Arbizzani E., Tecnologia dei sistemi edilizi. Progetto e costruzione, Maggioli Editore, Milano, 2011

SYLLABUS

Hrs	Frontal teaching
1	The building process, from requirements to performance. References to the main building systems (heavy, pushing, framed, tense cables)
2	General principles for sustainable design; the natural elements and the living quality
2	References to the generality and the characteristics of construction materials
2	References to materials of traditional construction: natural and artificial stone. Characters, properties and working methods.
2	References to construction materials: natural wood
2	References to construction materials: natural wood
2	Contemporary building materials: artificial wood, glued laminated timber, plywood, MDF and chipboard, recycled wood.
2	Building materials: cement and concrete
2	Building materials: iron, steel and cast iron.
2	Building materials: glass
2	Building materials: plastics
2	Foundation soil and relationship with building
2	References to constructive elements of tradition: the bearing masonry.
2	Contemporary building systems: the reinforced masonry, using nucleuses of reinforced concrete
2	References to constructive elements of tradition: pushing structures, arches and vaults
2	References to constructive elements of tradition: wooden or metal floors, wooden roofs
2	Constructive elements: structural elements using reinforced concrete. Structural elements: foundations, pillars, beams, floors
2	Constructive elements: structural elements using steel. Structural elements: pillars, beams, floors
2	Constructive technological units: reinforced concrete floors
2	Constructive technological units: reinforced concrete and steel attic floors
2	Constructive technological units: reinforced concrete, steel and glued laminated timber roofs
2	Constructive technological units: pre-stressed reinforced concrete structures; prefabricated construction systems.
2	Constructive technological units: external not-bearing walls, hollow walls
2	Constructive technological units: internal ceilings and partition walls
1	Constructive technological units: staircases and elevators
1	Constructive technological units: pavings
2	Constructive technological units: interior and exterior window fixtures, structural glazing
2	Constructive technological units: plasters and finishes

Hrs	Practice
3	Introduction to the issue of single-family residence, object of the assigned design exercise, with a particular attention to the various building types. Introduction to the theme of architectural design according to a functional/ technological/structural point of view, articulation of the drawings and tables or papers that constitute a building design and division of the students into teamwork-groups. Assignment of the design exercise theme to the student groups.
25	Group design exercise, concerning a building project of a single-family residence; the exercise will be assigned at the beginning of the course and will be reviewed by the professor and the assistant during the same design exercise, according to steps communicated to students.