



Degree course	Architettura C.U
Course code	
Lecturer	Martino Milardi
Course name	Design of building systems
Disciplinary area	B
Disciplinary field of science	8c/1
University credits - ECTS	6
Teaching hours	60
Course year	II
Semester	I

Brief description of teaching and learning objectives

The course belongs to the traditional disciplinary corpus of studies of Architecture and its name expresses the subject content of Architectural Technology, whose purpose is to study the processes of realization in architecture. The course includes a program that is characterized by a methodology that, tending to produce a preliminary design, final design and a partial experiences of executive planning, ports especially to think about the project.

More general objective is to contribute to the formation of a new culture of construction, which is able to mend the conceptual separation between time and moment of realization.

The course aims to be an application of technological design, built on the rejection of an independent and separate conception of the project; useful to the understanding of "building processes" and how the technological know-how to intervene in the design process. The aim of the course is to gain knowledge of the social role of the designer and the relationships that are established in architectural construction, between form and content, including social and environmental purposes, including use of materials and their performance, the spaces between logic, logic functions and structural reasons.

Prerequisites

In order to take the examination of the course Design of Construction Systems you must have already passed the exam "Materials for Architecture" (1st year of course) because the teachers assume that the student should have already acquired the knowledge refer to the basic technologies of materials, their production cycle and their place in the building process of the final product.

Course program

The teaching activity is articulated through teaching "ex cathedra" on the basic issues and theoretical knowledge and techniques (first phase), and through the mentoring activities for the development of the project (second phase), whose conception must be simultaneously expressed materially and technologically and then to the appropriate depth scale.

In the design process, students are required to pursue some guiding principles with respect to requirements such as:

- Safety
- Indoor Air Quality, Thermo-igrometric and Building Envelope Performance
- Protection of the environment (use of materials and environmentally friendly products; optimization of the building context, Renewable energy on Building)
- Flexibility typological and technological (adaptability, flexibility, integration, accessibility, usability)

- Implementation (speed of construction and assembly, level of prefabrication, adaptability to soil type)
- Management (maintainability and replaceability)
- Reversibility of the process (temporary - transience, recyclability, reusability).

The frequency of the courses will be verified through partial evidence and relate to three levels of activity: analytical-cognitive, elaborative and verification / validation.

Level cognitive-analytic

- the resources (materials, products, traditional and innovative building systems)
- processes and procedures (phases, subjects, organizational models)
- the theme (needs, wants, feasibility, legislation, regulations, cultural references)
- the context (external data morphological and climatic, geological, historical, urbanistic, architectural)

Level elaborative

Interrelations needs / resources / environment and evaluation of design degrees of freedom (the activity tends to produce two different design levels: preliminary - definition of environmental subsystem - and partial experiences of the final / executive - definition of the subsystem technology) .

Level of verification / validation

On the partial processing, and in progress, the course will develop actions of verification / validation based on:

- Relationship building / environment (appropriateness of the choices, minimizing impacts, exploitation of natural resources, etc.).
- Report program / project (translation of the program in terms of construction, dimensional aspects, distribution, performance);
- Report project / construction (relapses constructive options architectural image, classifications, processes, innovations, materials and techniques, drawings)
- Relationship building costs (basic information, calculations, specifications, etc.).

To support these activities will be provided prior teaching materials, with bibliographies, bibliographic-type cards, knowledge of technological systems, material anthology, etc.

Expected Results (acquisition of knowledge by the student)

The aim of the course is to provide the student with the knowledge of the relations in the construction of the architecture are established between form and content, between the social purposes of the environmental transformation and the means offered by the production, including the use of materials and their performance, between the logic of space, the logic of functions and structural reasons, in order to develop the capability to conceive, design and graphically return the key building blocks and their assemblies, verifying the economic and congruences regulations, controlling the role that materials and performing techniques in architectural design, the realization and, more generally, in the programming process-design-production use of an artifact.

Another important objective of the course is to stimulate the ability to design and draw the key building blocks and their assemblies, placing the necessary attention to the appropriateness of the technical choices to achieve the well-being of users, compared to the condition determined by the physical, economic, productive and social and local culture.

Energy saving, reduction of emissions and waste, healthy environment are inseparable objectives by achieving a global quality of the project.

The technical procedures for achieving these objectives, architectural solutions can be very different from each other, the reinterpretation and innovation of materials and traditional technologies, the sandwich construction Cleaning, at the construction site as a "kit" assembly.

Self-employment of the student

Lectures (hours / year in the classroom): 20

Exercises (hours / year in the classroom): 25

Practical activities (hours / year in the classroom): 15

Lavoro autonomo dello studente

The student will study the texts recommended the topics covered in lectures, will draw critically constructive

elements explained in the classroom supporting the drawings with photographic documentation and will have to prepare the Fact Sheets on building components. The graphic must deepen the aspects covered up to the executive project.

Assessment methods

The work produced in the classroom and at home, partly individual, partly developed by groups, will be tested and evaluated periodically, based on states of progress and programmed in a collective manner. Deliveries are scheduled ongoing testing during the year. Checks will be translated into "loans" for passing the exam.

In relation to the topics covered in the modules, the students are asked to perform exercises and partial tests, at intervals to be specified.

To support these activities will be provided prior teaching materials, with bibliographies, bibliographic-type cards, knowledge of technological systems, material anthology, etc..

Verification of the year, aimed at certification of the 6 credits required, consists of an interview, in the reconsideration of the partial assessments and evaluation of the documents produced during the year: exercises, written and graphic, photographic documentation, etc..

Suggested reading materials

Bibliografia adottata

- AA.VV., Manuale di Progettazione edilizia, vol. 1, 2, 3, 4, 5, 6, Milano, Hoepli.
- AA.VV. 2005 (2010 R), Grande Atlante di Architettura (Vol 3, 4, 5, 10, 11, 14, 18, 20) Torino, UTET.
- Arbizzani E. 2011, Tecnologia dei sistemi edilizi. Progetto e costruzione, Rimini, Maggioli Editore
- Campioli A., Lavagna M. 2013, Tecniche e Architettura, Torino, CittàStudi Edizioni.
- Quaroni L. 2001, Progettare un edificio. Otto lezioni sull'architettura, Bologna, Kappa.

Bibliografia di riferimento

- Mangiarotti A., Paoletti I. 2008, Dall'idea al cantiere. Milano, Hoepli.
- Milardi M. 2014, L'edificio risorsa. Caratteri e indicatori di ecoefficienza in edilizia, Roma, Ed Nuova Cultura.
- Nardi G. 2001, Tecnologie dell'architettura, Milano, Clup
- Salvadori M. 1979, Dalla Caverna al grattacielo, Roma, Armando Editori
- Torricelli MC, Del Nord R., Felli P. 2001, Materiali e tecnologie dell'architettura, Bari, Laterza.