



Dipartimento di Architettura e Territorio – dArTe

Corso di Studio in Architettura quinquennale – Classe LM-4

Degree course	Architettura quinquennale – Classe LM 4
Course code	
Lecturer	Francesca Giglio
Course name	Material, innovation and experimentation for the project
Disciplinary area	D
Disciplinary field of science	ICAR 12
University credits - ECTS	6
Teaching hours	60
Course year	IV- V
Semester	1°

Synthetic description and specific course objectives

The course is part of the discipline of Architectural Technology and is finalized to the acquisition of specific skills on the relationship between Innovation - Production - Materials, investigating how these aspects relate, triggering experimental design processes, based on the new complexity technology, materials and functions, appearance.

For the purpose of qualifying the objectives Study Course, it intends to acquire a working method and provide design tools able to deal with technological and design problems that characterize the modern constructions and to develop technological solutions and innovative realization processes.

These objectives will be achieved through a scientific collaboration path with one or more exponent of industry companies, manufacturers of façade systems.

In line with the skills that characterize the architect in Europe (Dir. 2005/36 EC), the training underlying objective, therefore, it's to investigate theoretically and operationally related issues, in making architecture, innovation design and the centrality of production, dealing with production companies consolidated in the Italian construction market and elsewhere, who can provide their own production know-how to develop innovative project ideas, in relation to real size, performance, economic, environmental constraints.

Course entry requirements

It's required the knowledge of the processes and constructive processes, in addition to knowledge of the functional, technological, environmental requirements, of the technological system's components and their control in the executive level of the project. Therefore, it will be necessary to have passed at least the examinations Materials for Architecture and Building systems design. It's advisable to also overcome the examination of Executive design.

Course programme

The architectural project, in recent years, is confronted primarily with two aspects; on the one hand the productive innovations: smarter materials, quality control, small series; on the other hand the complexity and the numerous technologies present in the various parts of the building. In this context, the course will be developed through the synergy with an industry company (or even more than one), which will bring its production experience and research as a field of study, debate, experimentation.

The collaboration between the scientific and productive contest is an experimental activity to be conducted in a course, with the specific goal to create a strong interchange between the demands of a company, often linked to the requirements of safety regulations, energy saving, reduction of resources, but also type economic and functional, and scientific competences that can be proposed, in terms of design innovation.

The course, therefore, will be organized, mainly, according to a laboratory logic, where students held a first part in theoretical and scientific character and a second part in close relationship with the company and with the inputs that it can deliver perspective of process and product innovation.

The first part of the course, of theoretical nature, will address the complexity of the topic through lectures about:

- Incremental innovation aspects: process, product, project
- The production role in the project
- The complexity of a component's design: material and performance

- Production chain and innovation: the experience of production

This last lesson will be conducted by the Company's Project Manager who, through the description of own company and the demands of innovation that a company can do to a group of students / researchers, will become the focal point of the course, which will start the workshop experience.

The theme will cover the a component's design (or a curtain system), which will have to follow the constraints and characteristics of the company's supply chain, characterized by a level of innovation relative to its functionality, the improvement of energy performance, to reuse of a component in production, etc ..

The second part of the course is represented by the workshop experience through which to address the project theme. This experience will be organized and managed, through small working groups (based on the number of students) that will address specific topics relating to the theme of the building envelope, both new interventions that for restructuring measures, to be decided through an interchange between the company and the students. A workshop experience, which must be addressed with strong science, through an analytical approach, the study of the more general aspects of the topic but also on functional and technological aspects and a second executive phase specifically of the project.

Expected results

The expected results are the student's ability to acquire a scientific working method and develop a project proposal to executive character . This working method provides. so that students acquire knowledge:

- On general issues relating to the relationship between innovation- Production-Materials
- On the operating situation of a company sector
- On the technological issues surrounding the design of a component

In addition to the results in theoretical, it will request a project proposal to executive character, on the design of a facade component, according to the real needs (and constraints) of a sector.companny

Course structure and teaching

Lectures (hours/year in classroom): 20

Practical class (hours/year in classroom): 5

Practical / Workshops (hours/year in classroom):35

Student's independent work

Each formative credit, will be completed by the specific activity of the student (15 hours per credit), which will cover their own individual study, based on the bibliography provided and particulars of teaching. The analysis and research, will be characterized by the graphic elaborate preparation activities required as deliveries during the course and that will be analyzed and reviewed in the classroom workshops moments, in collaboration with the teacher and with the Company. This approach, which aims to build the repertoire of knowledge and the logical path / deductive student, outlined by the Study Programme and the goals.

Testing and exams

The test mode will organized and arranged deliveries in the second part of the course, in which, the workshop part will represent the time of the main checks to be carried out exclusively in the classroom. The first part of the work will be organized in study groups on specific topics, and will follow with individual work of the student, to be carried out mainly in the classroom.

Suggested reading materials

- Acocella A. (2008), *Involucri in cotto*, Sannini impruneta, riedizione
- Gaspari J. (2008) *L'innovazione tecnologia e la sostenibilità nelle costruzioni*, Edicom (GO)
- Imperadori M., (a cura di) (2006), *La progettazione con tecnologia stratificata a secco*, Collana Tecnologia e Progetto, Il Sole 24 ORE, Milano
- Rogora A. Lo Bartolo D.(2013), *Costruire alternativo. Materiali e tecniche alternative per un'architettura sostenibile* , Wolters Kluwer Italia
- Sinopoli N., Tatano V. a cura di (2002) *Sulle tracce dell'innovazione, tra tecniche e architettura*, Francoangeli, Milano

The course will also provide bibliographic references and handouts on specific topics.

Web site

- www.architetturadipietra.it
- www.materialdesign.it
- www.modulo.net
- www.edilizianrete.it
- www.edilportale.it
- www.ilprogettostenibile.it

- www.infobuildenergia.it

Specific sector journals:

Arketipo, Azero, Costruire in laterizio, Detail, Modulo, The Plan, Progettare.