



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DiDA – DIPARTIMENTO DI ARCHITETTURA/ARCHITECTURE DEPARTMENT

C.d.L ARCHITETTURA MAGISTRALE – Curriculum in **ARCHITECTURAL DESIGN - iCAD** - Class LM-4 coc. B076

a.a.2018-19

ARCHITECTURE STRUCTURAL DESIGN LAB

PROF. RICCARDO RENZI (Architectural Design I)

PROF. MARIO DE STEFANO (Structural Design)

PROF. MARIAGIULIA BENNICELLI PASQUALIS (Building System Design)

Class Overview

The course includes an integrated multidisciplinary teaching in: *Architectural Design*, *Structural Design*, and *Building Systems Design*, focused on structural analysis. The specific educational purposes of a further discussion of the theoretical and operative basis behind structural design and dimensioning are integrated with the more general control of the design and composition, and of its constructive connotations, according to an educational plan aimed at providing, through the new Laboratories, an ever increasing organic consultation between the various aspects involved in the design process. Quick look at

<http://issuu.com/dida-unifi/docs/icad>

Common rules

During class is forbidden to use cell phones, drink and eat, and listen to music, talk loud or act in any way to disturb, etc.. During lecture is forbidden to use also computer etc. The student has to be present at each lecture and each desk critique/review. Each project/assignment deadline as scheduled is mandatory. The student will be able to reach the final exam only if has reached a minimum of 75% of presence at the lessons.

ARCHITECTURAL DESIGN 1 - B018878 - 6CFU –

PROF. RICCARDO RENZI

Teaching assistants: Elena Ceccarelli, Anna Dorigoni, Alessandra Marchetti, Giacomo Troiani.

Coll: Francesca Fiorentino.

Overview

The course is based on the architecture in different scale: from urban to the interior one. The design method start from urban readings and hidden and not hidden rules of architecture.

Assignment

Before to focus on final project each student will have to deliver (mandatory deadlines) several assignments. These exercises are useful for the student to understand Italian architecture and its particular system of hidden compositional rules, of building, of city, of public space. All the assignments are mandatory and will be delivered to the teacher as scheduled. The student will have also to read some books. All the assignments are held by a single student.

Final Project

Final Project will be the design for a new building; the topic will be cultural (eg. museum, cultural center, exposition center, library, theater). It will focus on building as special architecture and its role in the contemporary space of the city. The student will have to be present at Desk Critique/Review to show the project to the teaching staff. Only when the teaching staff will agree that the project is complete the student will be able to reach the final exam. The Architectural Structural Design Lab will have a single grade for each single student and it will be the mathematical media between the grades of Architectural Design I, Structural Design and Building System Design and its assignments.

Attendance

The student has to be present at each lecture and each desk critique/review. Each project/assignment deadline as scheduled is mandatory. The student will be able to reach the final project only if has reached a minimum of 75% of presence at the lessons. In each Desk Critique/Review student will have to show drawings (handmade or printed) in scale (1:500/1:200/1:100/1:50/1:20 are the scale accepted) and handmade model of the project (1:500/1:200/1:100/1:50). The teacher will not respond at any email from the student asking suggestions or indication on the project/assignment, the Desk Critique/Review is the only way for the student to show the work in progress. For each student is mandatory to sign in at the morning arrive in teacher's register of attendance.

Behaviour

During class is forbidden to use cell phones, drink and eat, and listen to music, talk loud or act in any way to disturb, etc.. During lecture is forbidden to use also computer etc. The student will have to carry always a A4 sketch book and drawings tools, plus materials for work on models as working in class.

Mandatory readings (a short abstract of these books will be provided by each single student at the end of class)

Le Corbusier, Toward an architecture, 1923

B. Zevi, Architecture as Space, 1948

A. Rossi, The Architecture of the city, 1966

G. Grassi, The Logical Construction of Architecture, 1967

G. Grassi, Architecture dead language, 1988

K. Elam, Geometry of design, 2001

Essential texts

K. Lynch, The image of the city, 1960

E.T. Hall, The Hidden dimension, 1966

N. Pevsner, A history of building types, 1978

C. Norberg-Schultz, Western Architecture, 1979

W. Lotz, Architecture in Italy 1500-1600, 1995

Suggested readings

C. Sitte, City Planning According to Artistic Principles, 1889

F.L. Wright, An organic architecture. The architecture of democracy, 1939 (1945)

W. Gropius, Scope of Total Architecture, 1955

P. Johnson, Mies van der Rohe, 1948

L. Mumford, The city in history, 1961

R. Koolhaas, Delirious New York, 1978

C. Van de Ven, Space in architecture, 1980

K. Frampton, A critical history of Modern Architecture, 1980

D. Watkin, German architecture and the classical ideal, 1987 (1990)

J. Baudrillard, J. Nouvel, The singular object of architecture, 2003

R. Koolhaas, Junkspace, 2006

P. Zumthor, Atmospheres, 2007

Email: riccardo.renzi@unifi.it ----Teacher's page <http://www.unifi.it/p-doc2-2015-0-A-2c2a3a293429-1.html>

STRUCTURAL DESIGN - B020740 - 6CFU –

PROF. MARIO DE STEFANO

Teaching assistant: Prof. Valerio Alecci

Overview

The Modulus of Structural Design aims at providing the students with the main theoretical bases and code requirements necessary for the structural design in seismic zones. Students will be able to understand the main structural features of reinforced concrete and masonry buildings and problems arising from regularity/ irregular shapes both in plan and elevation; they will also analyse o building damages and collapse mechanisms due to seismic events.

Learning Objectives

The Course of Architectural Structural Design Lab includes an integrated multidisciplinary teaching in: Architectural Design, Structural Design, and Building Systems Design, focused on structural analysis. The specific educational purposes of a further discussion of the theoretical and operative basis behind structural design and dimensioning are integrated with the more general control of the design and composition, and of its constructive connotations, according to an educational plan aimed at providing, through the new Laboratories, an ever increasing organic consultation between the various aspects involved in the design process.

Teaching Methods

Specific topics of the Modulus of Structural Design are presented during initial lectures. Subsequently, structural design of particular elements will be carried out and students will have to present their drawings at Desk Critique/Review to discuss and revise them with the teaching staff.

Further information

During class is forbidden to use cell phones, drink and eat, and listen to music, talk loud or act in any way to disturb, etc.. During lecture is forbidden to use also computer etc. The student has to be present at each lecture and each desk critique/review. Each

project/assignment deadline as scheduled is mandatory. The student will be admitted to the final exam only if has reached a minimum of 75% of attendance at the lectures.

Type of Assessment

Final exam will grade the final integrated project

Topics

Lessons from earthquakes:

- The L'Aquila seismic event of 6th of april, 2009.
- Reinforced concrete buildings damages and collapse mechanisms
- Masonry buildings damages and collapse mechanisms
- The effect of the structural regularity/irregularity
- Eurocode requirements

Principles of Conceptual Design:

- Structural simplicity
- Regularity
- Bi-directional strength and stiffness
- Torsional strength and stiffness
- Floor slabs as rigid diaphragms
- Adequate foundations

Design of reinforced concrete structural elements:

- Concrete and steel
- Ultimate Limit State
- Serviceability Limit State
- Bending design of rectangular cross sections
- Design of rectangular cross sections under combined axial and bending actions

Recommended Texts

EC8, Eurocode EN 1998, European Union norm on construction. Design of structures for earthquake resistance, 1998.
Seismic Design of Reinforced Concrete and Masonry Buildings, Paulay, T. and Priestley, N., John Wiley & Sons, 1992.
Design of Earthquake Resistant Buildings, Wakabayashi, M., McGraw-Hill, New York, NY, 1986.
The Seismic Design Handbook, F. Naeim, Ed., Kluwer Academic Publishers, 2001.
Earthquake Resistant Design, Dorwick, D., Wiley, New York, NY, 1989.
Fundamentals of Earthquake Engineering, Newmark, N. and Rosenblueth, E., Prentice Hall, New York, NY, 1971.

BUILDING SYSTEM DESIGN – B020741 – 6CFU

PROF. MARIAGIULIA BENNICELLI PASQUALIS

Coll: Luca Belatti

Overview

The course is related to the discipline of Technology of Architecture, where the main purpose is to provide the student with the operational tools in order to manage the relationship between architecture and technology, that means as following indicated:

- the architectural design as both a process and a product
- the understanding of the main construction models (elastic/framed-building; plastic/massive-buildings)
- the understanding of the objects of the architectural design as complex systems (instead of fixed objects).

The didactic is based on the understanding by design method where design activity represents the main tool of research. Problems will be then solved starting from design, through which to define constraints and “emergencies”, necessary for the different scenarios definition.

Assignment management

The course will be developed in two main phases:

- a first phase where students will be provided with the basic knowledge of the discipline; it consists of weekly lectures followed by *extempore* exercises to be accomplished in class. The exercises will be given from time to time, basing on the lecture contents
- a second phase where students will work on the final project applying practically the acquired knowledge during the design process.

The extempore exercises are mandatory and should be accomplished individually by the students. They would be collected in an A3 book as part of the final exam (see here below). The contents could focus on topics that differ from that of the final exam, in order to explore a wider range of cases and solutions.

Final project

As specified in the ARCHITECTURAL DESIGN 1 program, the final project will be the design of a new building and its relationship into the contemporary space of the building. Concerning the BUILDING SYSTEM DESIGN course, students will have to deliver specific outcomes aimed to define the feasibility of the project and the integration of the diverse components of the building system. The scale of the drawings will be defined on the specific needs of the solutions representation. The course will focus particularly on the building envelope solutions.

Final exam

The final exam will consist in the delivery of the final project, in accordance to the other teacher of the Architecture Structural Design Lab, and the evaluation of the A3 portfolio collecting the exercises produced by each student during the course.

Essential bibliography

AA.VV. (2006), *IFD Industrialised, Flexible, Durable*, attachment to the issue n. 24 of d'A_d'Architettura, May-August.

AA.VV. (2012), *Reduce Reuse Recycle: Architecture as resources*, Hatje Cantz, Ostfildern (D).

Bisig D., Pfeifer R. (2008), "Understanding by design – The synthetic approach to intelligence", in *Explorations in architecture – Teaching, design, research*, Issued by the Swiss Federal Office of Culture, Urs Staub, Edited by Reto Geiser, Birkhäuser, Basel-Boston-Berlin.

Le Corbusier, *Toward an architecture*, 1927.

Staib, G., Dörrhöfer, A., Rosenthal, M., & Anderle-Neill, C. (2008). *Components and systems: modular construction; design, structure, new technologies*. Basel: Birkhäuser.

The consultation of architecture periodicals is strongly recommended as a fundamental source of ideas, references, contemporary and historical suggestions.