



NATIONAL UNIVERSITY OF ENGINEERING

COLLEGE OF CIVIL ENGINEERING

CIVIL ENGINEERING PROGRAM

ES936 – ARCHITECTURE AND STRUCTURAL MODELING

I. GENERAL INFORMATION

CODE	: ES936 – Architecture and Structural Modeling
SEMESTER	: 9
CREDITS	: 03
HOURS PER WEEK	: 10 (Theory – Practice – Advisory)
PREREQUISITES	: EC211 – Structural Analysis I
CONDITION	: Mandatory

II. COURSE DESCRIPTION

This course prepares the student in the application of a design process with new concepts, methods and techniques of architectural-structural projection. The concepts of philosophy, assimilation process and adaptation of structures to the architectural project applied to a real estate type in contemporary architecture. The methodology is inductive the model based on the art of projecting and structural design strategies.

III. COURSE OUTCOMES

At the end of the course the student will:

- Organize analysis data for the interpretation of the real estate problem (architectural survey of the land and urban environment).
- Interpret the possible solution of the real estate type design with a proposal of various types of preliminary projects (the domination of the two-dimensional, three-dimensional, 4d and 5d graphics. (Quantitative variables).
- Analyze and understand the problem of project management and its possibility of putting it into current situation. The survey and its results with the potential client make the solution to the best response effective. (Qualitative variables).
- Develop the inductive projection methodology and the four-phase method. The application to a real residence project and structural design strategies.
- Plan and develop one of the possible responses of the proposed real estate project based on current regulations established for the construction industry and sustainable regulations to be profitable over time.
- Design a buildable project based on an interpretation of the problem and in a unique contest-level presentation.

IV. LEARNING UNITS

1. ORGANIZATION OF DATA AND MAIN NORMATIVE PARAMETERS

Visit of the land and its surroundings data collection through visual experience. It takes data from the probabilistic information entities of local, provincial or national government management.

2. INTERPRETER

Art Method Project / Rules of two-dimensional and three-dimensional graphic protest, 4D and 5D / Method of structural design strategies.

3. DESIGN

The qualitative conditions of the problem to translate into the design of the architectural response and structural design strategies.

4. TUTORSHIPS

These refer to three fields: student adaptation to the design, adaptation of graphic methods and shape geometry with materials, adaptation of group work or human resources. If necessary, it will be reinforced with visits by specialists or field visits in each progress of the workshop topic.

5. ANALYSIS AND STRATEGIES OF VARIOUS SPECIALTY COMPATIBILIZATION

Interpret the conditions of the specialties: Architecture, structure, Sanitary and Electrical in solving a proposal for a comprehensive design scheme for a buildable project. The knowledge of engineering drawing, the calculations of structural pre-dimensioning of the proposed material, the knowledge of layout of sanitary and electrical networks of the connections as the proposal of the design in the proposed environments.

6. PROPOSE AND PLAN

Through the real presentation of a fully constructible project in architectural, structural sanitary and electrical design schemes of the real estate project.

V. LABORATORIES AND PRACTICAL EXPERIENCES

- Theoretical issues consolidation.
- Delivery of the contemporary architectural blueprint.
- Consolidation of the methodology, presentation and essay of a theoretical subject of contemporary architecture and structural design strategies.
- Structural design response in contemporary architecture.
- Presentation of an architectural project at the contest presentation level in free or digital expression format on CD with visualization of the material.
- Structural design with various materials at the competition level presentation in free or digital expression format in CD.

VI. METHODOLOGY

The methodology is inductive. The course is developed with theoretical and practical classes. The sessions are divided into theoretical classes when specialists are invited and in practice classes a complete work is developed cyclically by specialty in architecture, structural schemes with specialties guidelines. In the theory sessions, the teacher presents the methodology to be used in a professional exercise project. In the practical sessions, various problems of the real

estate project are solved where a possible response is analyzed, projected, proposed and managed. In the sessions, conclusions must be reached in group project management for which the designer must present the project. In all sessions, the active participation of the student and his work group is promoted, for which he takes the method of teamwork.

VII. EVALUATION FORMULA

The learning will be evaluated through the "I" system.

- Practices 1 - 3: Weight 1
- Fourth Practice: Weight 3
- Laboratory experiences 1 and 2: Weight 1
- Laboratory experiences 3 and 4: Weight 4

$$FA = \frac{P1 + P2 + P3 + 4 * P4 + L1 + L2 + 4 * L3 + 4 * L4}{16}$$

VIII. BIBLIOGRAPHY

- Quaroni Ludovico, 2005, Designing a building, 8 Architecture lessons, Exarial Editores
- Bazant Jan, 2005, Urban Design, Mexico, Editorial Trillas
- Bernabeu Larena Alejandro, 2007, Doctoral Thesis: Structural Design Strategies in Architecture, Polytechnic University of Madrid
- Ministry of Housing, Construction and Sanitation, 2006, National Construction Regulations, Peru
- Ministry of Housing, Construction and Sanitation, Sustainability Regulation, Peru