



NATIONAL UNIVERSITY OF ENGINEERING

COLLEGE OF CIVIL ENGINEERING

CIVIL ENGINEERING PROGRAM

SYLLABUS: CONSTRUCTION DESIGN

I. GENERAL INFORMATION

CODE	: AU 111
CREDITS	: 3
HOURS PER WEEK	: 6 (Theory, Practice and Field Visits)
PRE-REQUISITE	: EC211 Structural Analysis I, EC712 Construction II
CONDITION	: Mandatory
DEPARTMENT	: Structures
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II. COURSE DESCRIPTION

The course prepares students for developing construction projects focusing on the architectural and structural components. It presents the diverse elements, components and aspects of construction projects, norms and prescriptions on enclosures, buildings, spatial relations, building dimensioning, installations and utensils having the human being as measure unit and objective. The course also includes topics of architectural design as well as architecture and construction norms and regulations. Students complete the construction design project of a medium-size building, usually a specific-purpose five-story building.

III. COURSE OUTCOMES

1. Collect, organize and interpret data and information regarding the construction project (land permissions, architectural norms and regulations, urban environment).
2. Elaborates and interpret architectural planes and civil works planes, as well as two and three dimensional drawings.
3. Understand and apply practical working methodologies to complete architectural projects.
4. Understand and interpret construction and architectural norms and regulations.
5. Understand and apply practical recommendations and guidelines to solve structural problems with architectural criteria.
6. Understand the diverse factors determining the architectural design and its implementation in the three natural regions of the country (Coast, Andean Mountains and Amazon Jungle).
7. Complete the construction design project of a building, present two-dimensional planes and three-dimensional models and simulations.

IV. LEARNING UNITS

1. INTRODUCTION. DATA COLLETION AND CONSTRUCTION PARAMETERS

Introduction. Interpreting client requirements. Civil works planes and drawings. Conventional signs of graphical expression. Methods for collecting information and construction parameters from government construction agencies.

2. ARCHITECTURAL DESIGN

Design methodologies. Architectural programs. Analysis of enclosures and building

functions and environments. Project draft. Building construction. Architectural terminology. Normalized procedures. Acoustic architectural technology. Thermal control.

3. CONSTRUCTION REGULATIONS

National construction regulations. Scope of urban construction regulations and legislation. Zoning. Potential and permitted use of land. Land habilitation. Division and subdivision of lands. Architectural requisites. Occupancy requirements. Monumental legacy and heritage.

4. CONSTRUCTION NORMALIZATION

Architectural design and structuration. Measures ordering for normalization of structures of buildings. Structural mechanization according to materials to be used: brick, adobe, concrete, reagents, others. Structuration alternatives according to materials and technologies. Architectural shapes and forms as result of materials being used, the climate and the purpose of the building.

5. PREFABRICATED BUILDINGS

Prefabricated buildings. Factory-build components. Prefabricated components based on wood and concrete. On-site assembling. Modular unit systems design. Prefabricated commercial buildings and standardization.

6. INTEGRATION AND COMPATIBILIZATION OF SPECIALITIES

Sanitary, plumbing and electrical requirements. Integral design of a construction project. Integration of architectural, structural, sanitary, plumbing and electrical requirements.

7. HOUSING BUILDINGS AND ARCHITECTURE

Housing buildings. Examples of simple constructions. Analysis and proposals. Architectural design through history. Analysis and proposals. Peruvian architecture. Analysis and proposals.

V. METHODOLOGY

The course includes theory and practice sessions. In theory sessions the instructor presents the concepts, definitions and applications promoting students participation for analyzing diverse issues and aspects related to architectural design and construction, as well as analyzing national norms and regulations. In practice sessions students solve diverse problems on architectural design and building construction. Students are encouraged to actively participate in theory and practice sessions analyzing and making well supported proposals. Throughout the course, students complete the construction project of a specific-purpose building working in teams. At the end of the academic semester, students should present and defend a report.

VI. EVALUATION FORMULA

The final grade (PF) is obtained as follows:

$$PF = (PC1 + PC2 + PC3 + 3 PC4 + PC5 + PC6 + 4 PC7 + 4 PC8) / 16$$

Where:

PC1, PC2, PC3 PC7, PC8: grade of quizzes and reports.

VII. BIBLIOGRAPHY

1. Neufert, Ernst

The Art of Projecting in Architecture (Architects Data).
Wiley-Blackwell Ed.

2. Ministry of Housing, Construction and Sanitation (Peru)

Constructions National Norms and Regulations.