



**NATIONAL UNIVERSITY OF ENGINEERING**  
**COLLEGE OF ENVIRONMENTAL ENGINEERING**  
**ENVIRONMENTAL ENGINEERING PROGRAM**

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**PA425 – PROJECT DESIGN AND EVALUATION**

**I. GENERAL INFORMATION**

<b>CODE</b>	: PA425 Project Design and Evaluation
<b>SEMESTER</b>	: 9
<b>CREDITS</b>	: 4
<b>HOURS PER WEEK</b>	: 6 (Theory–Practice)
<b>PREREQUISITES</b>	: GA141
<b>CONDITION</b>	: Compulsory

**II. COURSE DESCRIPTION**

The course prepares students to understand the general concepts of projects. Project size. Location of the project. Project technology. Investment and financing. Studies of costs and revenues. Evaluation. Organization, administration and legal framework. Final engineering studies and submission guidelines. During the course, the processing of feasibility studies and the development of a final project are presented.

**III. COURSE OUTCOMES**

1. Interprets the applicable technical standards and criteria for lead or participate in the conception and development of projects.
2. Understand the technical, economic and financial viability of projects.
3. Identify the components of the final study.
4. Organize the technical documentation for the execution of engineering projects.

**IV. LEARNING UNITS**

**1. GENERAL CONCEPTS PROJECTS / 12 hours**

Course Focus. Methodology. General concepts of projects: meaning of engineering projects. Types of Projects. Definition and project stages: preliminary study, pre-feasibility, feasibility, implementation and installation, commissioning and operation.

**2. MARKET STUDY OF A PROJECT / 04 hours**

Market study: product demand, supply and price. Market research.

**3. TECHNICAL STUDY OF A PROJECT / 12 hours**

Locating a project: location factors and choice of alternative locations. Project size: previous studies, product definition to produce, production process, diagrams of plant and production capacity. Technology of the project: Study of distribution of machines and equipment. Determination of installed capacity.

**4. PROJECT EVALUATION / 12 hours**

Investment and financing. Definitions. Investment and Financing structures. Cost study. Classification of operating costs. Depreciation. Determination of income. Breakeven. Project evaluation: economic evaluation. Financial evaluation. Sensitivity analysis.

## **5. PROJECT MANAGEMENT / 04 hours**

Organization, administration and legal framework of the project.

## **6. FINAL PROJECT AND GUIDELINES FOR PRESENTATION / 12 hours**

Final Engineering Study. Basic engineering and detail engineering. Guidelines for submission of final engineering studies: descriptive memory, technical specifications, quantities, budgets, project schedules and plans. Guidelines for presentation of engineering reports. Presentation of engineering services. Engineering services mode. Guidelines for submitting proposals for economic and, technical services.

## **V. METHODOLOGY**

The course takes place in theory and practice sessions. In the theory sessions the teacher presents the concepts and explains the applications. In the practice sessions, case studies are analyzed. Halfway through the development of the course students must submit a feasible project and at the end of the course students must submit and present an integrated project. In all sessions the active student participation is encouraged.

## **VI. EVALUATION FORMULA**

The Average Grade PF is calculated as follow:

$$PF = ( EX1 + EX2 + TF ) / 3$$

**EX1:** Exam 1

**EX2:** Exam 2

**TF:** Final Report / Final Project

## **VII. BIBLIOGRAPHY**

### **1. SAPAG CHAIN, NASSIR**

Formulation and Evaluation of Investment Projects,  
Mc Graw Hill. Fifth Edition, 2012.

### **2. PMBOK**

Project Management Body of Knowledge  
Project Management Institute PMI  
2014