



**NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF MECHANICAL ENGINEERING
MECHANICAL ENGINEERING PROGRAM**

MC612 - ENGINEERING PROJECTS

I. GENERAL INFORMATION

CODE	:	MC-612 Engineering Projects
SEMESTER	:	8
CREDITS	:	3
HOURS PER WEEK	:	4 (Theory–Practice)
PREREQUISITES	:	MS-213 Engineering Economics and Finance
CONDITION	:	Compulsory
DEPARTMENT	:	Applied Engineering
INSTRUCTOR	:	Santiago Paredes Jaramillo, Enrique Sarmiento Sarmiento
INSTRUCTOR E-MAIL	:	sparedesj@yahoo.com, esarsar@gmail.com

II. COURSE DESCRIPTION

The course prepares students for analyzing and evaluating the technical and economic feasibility of engineering projects. Students identify an engineering project opportunity, determine the size of the market to attend, propose the project location, compare potential technologies and select the most appropriate. Students also determine the investment and cash flow requirements, and evaluate the financial feasibility according to several criteria. The implementation of the project, as well as its organization, administration and legal issues are analyzed.

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