



**NATIONAL UNIVERSITY OF ENGINEERING**  
**COLLEGE OF CIVIL ENGINEERING**  
**CIVIL ENGINEERING PROGRAM**

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**CO821 – CONSTRUCTION PROJECTS MANAGEMENT**

**I. GENERAL INFORMATION**

<b>CODE</b>	: CO821 – Construction Projects Management
<b>SEMESTER</b>	: 8
<b>CREDITS</b>	: 03
<b>HOURS PER WEEK</b>	: 06 (Workshop)
<b>PREREQUISITES</b>	: CO721 Construction Integrated Management CO722 Environmental Impact Evaluation
<b>CONDITION</b>	: Mandatory

**II. COURSE DESCRIPTION**

The course prepares the student for cognitive, instrumental and attitudinal development in the domain of concepts, methods and techniques for planning, programming, management and control of timing and costs of an infrastructure project. The concepts of time and costs will be presented as derived from the planning through the knowledge of the construction object project, characterization of the project and socio-economic environment, mastery of the processes theory and their organizational methods. The techniques that allow contrasting the time and cost budget with the actual results in the construction stage will be shown.

**III. COURSE OUTCOMES**

At the end of the course the student will:

- Analyze the project documents and identify their incompatibilities, as well as the advantages and disadvantages of the socio-economic environment and environment, and define the most relevant production resources to formulate the work execution plan alternatives.
- Know the theory of construction processes, define the technological stages and their component processes, understand the basic principles of industrial production of the construction processes and distinguish the levels of labor productivity.
- Know the theory of chain construction production and differentiate from artisanal production.
- Design the work execution plan.
- Know and apply the theory of graphs for the programming of construction processes. Understand the cost time relationship.
- Know and structure the process management through short-term plans and programs. Structure the phases or chains and formulate the information and reporting system for the control of time and cost of work and proposal of measures.

**IV. LEARNING UNITS**

**1. GENERAL WORK PLANNING**

Study of the project to build. / Determination of construction processes. / Construction planning

## 2. WORK PROGRAMMING

Graph theory applied to construction / Deterministic, semi-probability and probabilistic networks / Construction of arch-work and vertex-work networks / Precedence Relations / Algorithms and calculation of networks / Methods of reducing the duration of the network: use of internal resources and/or external and network topology restructuring / Cost-time ratio / Application of work programming software.

## 3. WORK COSTS

Scheduling of contractual work, scheduling of target work / Structuring by production chains or by control phases / Short-term work schedules / S-curve / Field information, production reports / Identification of deviations, corrective measures / weekly, monthly reports and end of work.

## 4. WORK MANAGEMENT

Short term programming. / Valuation and settlement of work. / Organization of the technical administrative management of the work.

## V. LABORATORY SESSIONS

Group staggered work: File of infrastructure work programming, as part of the technological construction production project.

## VI. METHODOLOGY

The course takes place in theory and practice sessions. In the theory sessions, the teacher presents the concepts, theorems and applications. In the workshops, various problems are solved and their solution is analyzed. In the development process and at the end of the course the student must prepare and present an integrating work or project. Throughout the teaching-learning process, active student participation is promoted.

## VII. EVALUATION FORMULA

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

- Average of Practices: AP
- Qualified Practices: QP, during the semester 8 practices are taken, and the one with the lower grade is eliminated, so the final average is equal to the average of the 7 remaining grades.

$$FA = AP = \frac{\sum_1^7 QP_i}{7}$$

- Final Average: FA

## VIII. BIBLIOGRAPHY

- Construction Planning for Linear Projects. Journal of the Construction Division. Proceedings of the American Society of Civil Engineers. New York, USA
- Aldo D. Mattos, Fernando Valderrama, Eds. 2014. Method of PLANNING AND CONTROL of construction projects. Editorial Reverté, S.A, Barcelona, 2014.
- SERPELL, Alfredo. Construction operations administration. Editions Catholic University of Chile.