PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
SCHOOL OF ENGINERING
DEPARTAMENT OF CONSTRUCTION ENGINEERING AND MANAGEMENT
ABET COURSE SYLLABI

ICC3434 CONSTRUCTION OF INDUSTRIAL PROJECTS

Credits and contact hours:	10 credits / 10 hours (3 hours in lectures; 7 h. individual work hours per week and visit field)
Instructor's name:	Carlos Videla, Martín Contreras
Course coordinator's name	Carlos Videla
Textbook:	ICHA (2008) Manual de diseño para estructuras de acero. 2a edición. Cary, H. (ed) (2004) Modern welding technology. 6th edition. Prentice. MacDonald, J.; Rosnagel, W.; Higgins, L. (2009) Handbook of rigging for construction and industrial operations. 5th edition. Mc Graw Hill.
Course Catalog Description:	The construction of industrial projects is understood to be the group of heavy construction activities related to the installation, testing and commissioning of industrial complexes. This type of project contains everything in a civil construction project, but it is characterized by the large quantity of steel, the amount of equipment that must be installed, large amount of lifting equipment and rigging accessories, numerous workers and large installations. They are also difficult to build due to the complexity of the projects and the many specialists involved. However, they are a great challenge and opportunity for new and exciting techniques for construction and testing methods that allow for dramatic improvements of the properties and performance of steel structures to satisfy the ever greater requirements of the owner with respect to shorter construction times, lower costs, greater security and higher quality. The course provides a teaching and learning experience for the students as the obtain a thorough understanding of a wide range of topics within the field of steel technology and industrial construction, promoting improvements in quality, productivity, and security in industrial installation. The course introduces the mos relevant aspects of the industrial construction process, highlighting the study of traditional and special technologies applicable to each stage of this construction type. A case study consisting of the installation design of a project will be carried out by students in teams with the objective of designing the accessories or lifting gear, selecting cranes, defining procedures for lifting and planning installation activities for the construction of an area of a real industrial project.
Prerequisite Courses:	ICC2104 Technology of Civil Engineering Materials and ICE2403 Structural design and ICC2304 Construction Engineering
Co-requisite Courses:	None
Status in the Curriculum:	Required
Course Learning Outcomes:	- Identify the field of industrial assembly, with a special emphasis on their characteristics, needs, projections, specialties and professions involved, as well as applical codes and standards.

- Specify and evaluate the properties of structural steel connection elements and installation hardware
- Understand the principles of structural design and apply design rules to determine the stresses acting on the structure and assembly equipment under conditions of service and lifting.
- Identify the principles of design, specification, manufacture and inspection that govern welded and screwed joints.
- Interpret and use design, manufacturing and installation plans, recognize symbols, nomenclature and vocabulary and utilize technical specifications in the stages of manufacturing and assembly of industrial structures and facilities.
- Apply different methods for estimating quantities and utilizing precedents for the preparation of manufacturing budgets and for installing industrial complexes.
- Recognize technologies and procedures for normal products and structures, identify manufacturing conditions and personalize techniques for quality control
- Apply design principle for designing systems, cables, accessories and rigging, and selecting and specifying equipment (cranes) requires for moving pieces in the installation of industrial projects.
- Study and design assembly procedures and maneuvers and apply techniques and procedures for the quality control of the installation of structures and industrial equipment.
- Understanding the relationship between durability and behavior of steel against corrosion and fire and identify execution techniques and inspection of protection systems.

Relation of Course to ABET Criteria:

a. Knowledge of mathematics, science and engineering
b. Design and conduct experiments: analyze and interpret data
c. Design a system, component, or process
e. Identify, formulate, and solve engineering problems
h. Broad education necessary for global, economic, environmental and societal context
k. Techniques, skills, and modern tools for engineering practice.

Topics covered:

Characteristics, classification and stages of construction operations in industrial installations; differences from civil works
Steel Industry: Characteristics, properties, production, classification and characteristics of structural steel.
Engineering of design and details
Structure manufacturing
Heavy assembly equipment
Accessory design for maneuvers
Maneuver calculation and study (Rigging) and lifting procedures
Cutting processes and metal welding and anticorrosive protection