PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
SCHOOL OF ENGINERING
DEPARTMENT OF INDUSTRIAL AND SYSTEM ENGINEERING
ABET COURSE SYLLABI

ICS 2023-ENVIRONMENT RISK ANALYSIS

Credits and contact hours:	10 UC Credits /10 hours (2:40 hours lectures; 1:20 hours assistantship and 6 hours individual work hours per week)
Instructor's name:	Luis Cifuentes
Course coordinator's name	Luis Cifuentes
Textbook:	Wilson, R. & Crouch, E. Risk-Benefit Analysis. Boston, Harvard University Press, 2001.
Course Catalog Description:	One of the fundamental problems which confronted modern society are the potential negative consequences associated with the development and introduction of new technologies , the use of natural or artificial substances on a large scale , or the realization of human activities. These technologies , substances and activities , which are an integral part of our current way of life contribute to improving our quality of life , but may have unacceptable impacts on the environment, in our own lives and in society as a whole. This course aims to develop in students the ability to address complex problems, that usually are not clearly defined, in which many highly interconnected entities involved, and for which there is no single or perfect solution. The integrative concept under which these problems are structured and alternatives management is risk analysis, particularly the Environmental Risk Assessment. A significant fraction of the course focuses on developing in students the analytical and integrative capacity that allows them to structure a complex problem using the tools of risk analysis, identifying the main components involved, the main relationships between them, the rules of behavior or response govern this relationship, the (negative or positive) that different management interventions can cause, and ultimately impacts, social acceptability of consequences. The other fraction of the course focuses on the students are able to understand the response of the receptors of interest against pressures that generate impacts, the functional relationships between components of the systems involved , including people and society. The course uses a methodology for active student participation. The different methods are presented through the study of relevant environmental problems, which require methods for resolution.
Prerequisite Courses:	ICH2304 Environmental Engineering

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Co-requisite Courses: None

Status in the Curriculum: Required

Course Learning Outcomes:

1. Understand the concept of risk in general and environmental risk in particular its objective and subjective dimensions.
2. Identify types of risks and hazards associated with different substances, technologies and human activities.
3. Know and be able to apply the various risk analysis tools to solve a complex environmental problem.
4. Understand the limitations of the methods and tools applied in the resolution of a complex environmental problem, and as you should be formally incorporated into the analysis.

Relation of Course to ABET Criteria:

b. Design and conduct experiments: analyze and interpret data
c. Design a system, component, or process
e. Identify, formulate, and solve engineering problems
f. Professional and ethical responsibility
j. Knowledge of contemporary issues

Topics covered:

The course addresses relevant to introduce and apply the basic concepts that make any analysis of environmental risk issues.

1. The anthropogenic interference with the climate (Climate Change)
February. Air pollution as an unintended result of the industrial and social development
March. Society's vulnerability to extreme natural events (natural disasters)
April. Negative impacts of electricity generation