

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE  
COLLEGE OF ENGINEERING  
DEPARTMENT OF ELECTRICAL ENGINEERING  
ABET COURSE SYLLABI

**ICH2314 WATER QUALITY**

<b>Credits and contact hours:</b>	10 UC credits/10 hours (3 h. Lectures; 1,5 h. Assistanship and 5,5 h. Independent learning experiences)
<b>Instructor's name:</b>	Pablo Pastén G.
<b>Course coordinator's name</b>	Pablo Pastén G.
<b>Textbook:</b>	Benjamin M. Water Chemistry. McGraw-Hill, 2000. Snoeyink & Jenkins, Wiley, 1980
<b>Course Catalog Description:</b>	The sustainability of human activities and their interaction with natural systems depends strongly on water quality aspects. The functioning of cities, the development of industrial projects, agriculture and mining activities require water in quality and quantity. Water quality is a key aspect for designing public infrastructure, assessing and management water resources, design of environmental remediation and proposing prevention measurements that assure sustainability and environmental viability of development projects. This course provides a basic conceptual and quantitative framework that introduces the student into modeling of chemical and biological processes that control water quality and the use of water quality parameters and techniques for their characterization.
<b>Prerequisite Courses:</b>	ICH2304 Eenvironmental engineering
<b>Co-requisite Courses:</b>	None
<b>Status in the Curriculum:</b>	Required
<b>Course Learning Outcomes:</b>	<ol style="list-style-type: none"><li>1. Identify and understand the fundamental physical, chemical biological foundations that control water quality in natural and engineered systems.</li><li>2. Build and apply simple conceptual and quantitative models of the processes of the processes that determine water quality in rivers, lakes, sediments and aquifers.</li><li>3. Introduce the student to current challenges and issues in water quality.</li></ol>
<b>Relation of Course to ABET Criteria:</b>	<ol style="list-style-type: none"><li>b. Design and conduct experiments: analyze and interpret data</li><li>c. Design a system, component, or process</li><li>e. Identify, formulate, and solve engineering problems</li></ol>

- g. Effective communication
- k. Techniques, skills, and modern tools for engineering practice.

**Topics covered:**

1. Water quality parameters
2. Thermodynamics of water quality
3. Acid base reactions
4. Complexation reactions
5. Precipitation/dissolution reactions
6. Redox reactions
7. Reactions catalyzed by microorganisms.
8. Assessment of water quality and the processes controlling it
9. Semester applied experimental/field basic project