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Personería Jurídica No. 192 de 1946 de Mingobierno  
Nit.: 860.013.798-5



## FREE UNIVERSITY PEREIRA SECTION

### UNDERGRADUATE PROGRAM IN ENVIRONMENTAL ENGINEERING



**SUBJECT:** CHEMISTRY I AND LABORATORY

**CODE:** -----

**SEMESTER:** FIRST

**HOURS** **WEEKLY: 6**

**THEORETICAL: 4**

**PRACTICES: 2**

#### GOALS.

That the student is able to establish and correlate concepts and laws

basic Chemistry and how to use them in relation to water

That the student can correctly use the materials, equipment and reagents

laboratory and interpret and handle the analytical techniques used in water analysis

That the student is able to interpret the results obtained in the analysis

of water and evaluate its quality based on current legislation in Colombia and Venezuela



**CAMINANDO EN LA  
EXCELENCIA**



[www.unilibre.edu.co/pereira](http://www.unilibre.edu.co/pereira)

Pereira, campus Universitario Belmonte - Av. Las Américas carrera 28 No. 96-102. Sede Centro, calle 40 No. 7-30. Sede Comité de Cafeteros Cra. 9a. 36-43.  
PBX: (6)3401081 - 3401043



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## METHODOLOGY.

The course will be developed with master lectures by the professor on the content basic knowledge of the subject; for their part, students will strengthen their knowledge of the subject through recommended readings, consultations with the teacher and the development of application problems. For laboratory practices, the professor will illustrate briefly the content and purpose of the same and its relationship with the topic seen; The students will then proceed to carry out the practice and their respective report.



## WORK PROGRAM.

Importance of water in life; natural water resources; hydrological cycle; consequences of the lack and misuse of water; uses of water

Water quality criteria. Water characteristics and considerations regarding standards  
Water quality: discussion on current regulations in Colombia (decrees 1594 and 2105, Law 99 of 1993) and Venezuela (Environmental Criminal Law, Decrees 2221, 2222, 2224)





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Basic concepts of general chemistry: measurements and conversion factors; atoms, molecules and moles; formulas and compositions; measurement and molecular weights of gases

Chemical reactions

Chemical Equilibrium applied to water chemistry: ionization, acids and bases, solutions buffer

Quantitative Chemical Analysis and its application in chemical analysis of water: Concepts of Quantitative chemistry; volumetric analysis, colorimetric analysis, physical methods

Fundamentals of chemical instrumentation and its application in water analysis



## LITERATURE.

SAWYER & McCARTY, Chemistry for Environmental Engineering, McGraw Hill, Inc. New York, 1978

SIENKO MJ, PLANE RA, Chemistry Ed. McGraw-Hill



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ROMERO R. JAIRO A., Aquachemistry, Colombian School of Engineering, 1990

GARZON GUILLERMO, Theory and Problems of Fundamentals of General Chemistry Ed.

McGraw Hill

CONGRESS OF THE REPUBLIC OF COLOMBIA, Environmental Law. Law 99 of 22

December 1993, CORPONOR

ORTEGA TORRES JORGE, National Code of Renewable Natural Resources and

Environmental Protection, TEMIS Publishing House, Bogotá, 1986

CONGRESS OF THE REPUBLIC OF VENEZUELA, Forestry Law of soils and waters,

Official Gazette No. 997, extraordinary 8-1-66.

ASPURUA PEDRO P., "Water Law, Analysis, Study, Proposition", Ministry of

Environment and Renewable Natural Resources, General Directorate of Planning and

Environmental Management, Caracas, November 1981

MARNR, Environmental Criminal Law and its Technical Standards, MARNR, Imago, Caracas, 1992

