



UNIVERSIDAD LIBRE®

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



FREE UNIVERSITY PEREIRA SECTION

UNDERGRADUATE PROGRAM IN ENVIRONMENTAL ENGINEERING



SUBJECT: ENVIRONMENTAL GEOLOGY

CODE: -----

SEMESTER: SEVENTH

HOURS WEEKLY: 6

THEORETICAL: 4

PRACTICES: 2

REQUIREMENTS: SOILS I

GOALS.

- That the student knows the laws relating to the existence and distribution of water underground
- That the student knows the hydrogeological techniques in water research underground

METHODOLOGY.





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The course will be developed with master lectures by the professor on the content

basics of the subject; for their part, students will strengthen their knowledge of the subject

through recommended readings and consultations with the professor

WORK PROGRAM.



1. HYDROGEOLOGY

- The hydrological cycle: Magnitude of groundwater resources, origin and evolution water, hydrograph analysis and its hydrogeological significance
- Physical and chemical properties of water, water quality
- Occurrence of groundwater. Distribution
- Formation of aquifer systems: alluvial aquifers; types of aquifers; influence of the geological structure in the formation of aquifers
- Regional factors that control the presence and distribution of groundwater; piezometric level fluctuations, compressibility and elasticity of aquifers
- Groundwater movement: direction and speed, tracers, flow networks, construction, interpretation
- Characteristics of aquifers
- Aquifer testing





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2. HYDROGEOLOGICAL TECHNIQUES IN WATER RESEARCH

UNDERGROUND

- Groundwater exploration: Hydrological methods; geological methods
- Remote sensors: Geological photointerpretation, methodology, general aspects of the rock identification, drainage networks, mapping of sedimentary rocks
- Geophysical methods: electrical, seismic, magnetic, gravimetric, radiometric, Thermal; study, analysis and interpretation of the electrical resistivity method
- Well logs: Spontaneous potential, electrical resistivity, gamma rays, diameter, influencing factors, applications

3. HYDROGEOCHEMISTRY

- Presentation of chemical analysis, applications in the study of origin and movement groundwater, identification of contamination sources, correlations
- Saline intrusion and coastal aquifers. Isotopes in groundwater: Concepts basics, applications and practical uses
- Organization of exploration and exploitation of groundwater.
- Management of groundwater resources.
- Hydrogeological maps: signs and conventions



LITERATURE.





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CUSTODIO E, LLAMAS MR, Underground Hydrology, Omega, Barcelona

FREEZE RA, CHERRY JA, Groundwater (Prentice-Hall, Englewood-USA)

US EPA Groundwater handbook - technology transfer report. US Environmental Protection Agency Report EPA/625/6-87/016., 1987

CAMPBELL MD, LEHR JM, Water well technology, McGraw Hill, New York, 1973

CEPIS Groundwater Quality Monitoring, WHO, PAHO, Health Program Environmental (ILPE), Lima, Peru, 1989

