FREE UNIVERSITY PEREIRA SECTION

UNDERGRADUATE PROGRAM IN ENVIRONMENTAL ENGINEERING

SUBJECT: **SOILS I AND LABORATORY**

CODE: **----------**

SEMESTER: **SIXTH**

HOURS **WEEKLY: 6**

THEORETICAL: 4

PRACTICES: 2

REQUIREMENTS: **GEOLOGY AND GEOLOGY PRACTICES**

GOALS.

That the student is trained in the basic knowledge of Soil Mechanics and be able to identify the characteristics that differentiate the different types of soils and acquire the skill to determine their properties.

METHODOLOGY.

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, consultations with the teacher and development of problems of application.

In the laboratory, students will perform the necessary calibrations and measurements, They will analyze the different structures and textures of the soil, perform percolation tests and the other experiments developed with the fundamental theory of soil science.

WORK PROGRAM.

- Soils, origin and formation. Constituent minerals
- Physico-chemistry of clays
- Volumetric and gravimetric relationships in soils
- Characteristics and structuring of mineral particles
- Granulometry in soils
- Plasticity
- Soil classification and identification
- Capillary phenomenon and contraction process
- Hydraulic properties of the soil
- The phenomenon of one-dimensional soil consolidation

• Shear strength of soils

• Mechanical behavior of soils in the triaxial test

• Soil compaction

• Soil exploration and sampling

LABORATORY PRACTICES.

• Specific gravity. Field identification tests. Size analysis
Grains. Sieving, settling, and hydrometer calibration

• Calculations of Cu and Cc, etc. Atterberg limits (Liquid limit, plastic limit and
shrinkage)

• Soil classification.

• Permeability: constant and variable head

• Simple compression

• Compaction: Standard Proctor, Modified Proctor

• Density on the ground

• Direct cut

• Consolidation: Curves and calculations of Cv, Av, mv, K, etc.

Triaxial compression

LITERATURE.

TERZAGUI K., PECK RB, Soil Mechanics for Engineers

LAMBE TW, WHITMANN RV, Soil Mechanics, Ed. Limusa,-Wiley. Mexico City

JUAREZ BE, RICO RA, Soil Mechanics, Ed. Limusa, Mexico City