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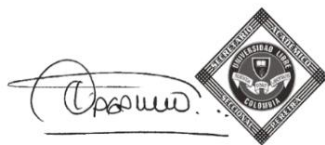
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**FREE UNIVERSITY PEREIRA SECTION**

**UNDERGRADUATE PROGRAM IN ENVIRONMENTAL ENGINEERING**



**SUBJECT:** CALCULUS I

**CODE:** -----

**SEMESTER:** FIRST

**HOURS** WEEKLY: 4

THEORETICAL: 4

PRACTICES: 0

**GOALS.**

- That the student is able to define and analyze the properties of the concepts of limit, continuity and derivative
- That the student is able to interpret and analyze the properties of the concept of integration as a generalized sum

**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





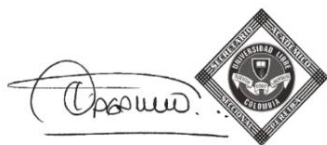
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through recommended readings, consultations with the teacher and the development of problems of application.

### **WORK PROGRAM.**



- Limits and their properties
- Continuity
- Derivation of different functions: trigonometric, logarithmic, exponential, etc.
- Related reasons
- Applications of the derivative
- First derivative; concavity, second derivative criterion
- Integration
- Integration of different functions
- Integration by simple fractions; special cases of integration; improper integrals
- Applications of the integral
- Work; moments, centers of mass and centroids; arc length and surface area  
revolution
- Infinite series; sequences; series and convergences, comparison criteria
- Integral criterion; quotient and root criteria; alternating series; series of  
Taylor and MacClaurin series powers

### **LITERATURE.**





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THOMAS APOSTOL, Calculus, Volume 1

AYRES, MENDELSON Differential and Integral Calculus Schaum Series, McGraw Hill

MEDINA, Introduction to Calculus, McGraw Hill

