**Semester: 02**

**Teaching unit: Fundamental**

**Subject: Analysis 2**

**Credits: 6**

**Coefficient: 4**

**Course objective:**

This subject aims to present to students the different aspects of integral calculus: Riemann integral, different techniques for calculating primitives, introduction to solving Differential equations.

**Recommended prior knowledge:** Analysis 1.

**Chapter I: Indefinite integrals**

Indefinite integral; some properties of the indefinite integral; Integration methods: Integration by change of variable, Integration by parts, Integration of rational expressions, Integration of irrational functions.

**Chapter II: Definite integrals**

Definite integral, Properties of definite integrals, Integral function of its upper bound, Newton-Leibniz formula, Cauchy-Schwarz inequality, Darboux sums-Conditions of the existence of the integral, Properties of Darboux sums, integrability of continuous functions and monotonous.

**Chapter III: First-order differential equations**

General, Classification of first-order differential equations, Equation with separable variables, Homogeneous equations, Linear equations, Bernoulli method, Method of variation of the Lagrange constant, Bernoulli equation, Total differential equation, Riccati equation.

**Chapter IV: Second-order differential equations with constant coefficients**

Homogeneous second-order differential equations with constant coefficients, Inhomogeneous second-order differential equations with constant coefficients, Methods for solving second-order differential equations with constant coefficients.