

Analysis 2

1. **Course number and name:** 020AN2CI3 Analysis 2
2. **Credits and contact hours:** 6 ECTS credits, 3x1:15 contact hours
3. **Name(s) of instructor(s) or course coordinator(s):** Nancy Chalhoub
4. **Instructional materials:** Course handouts; slides; in-class problems
5. **Specific course information**
 - a. **Catalog description:**

Normed vector spaces: continuity, uniform continuity and Lipchitz continuity, compactness, linear maps, path connectedness – Generalized integrals: tests of convergence, dominated convergence - Functions of several variables: directional and partial derivatives, differentiability, gradient, extrema of functions of several variables, differential forms, multiple integrals, line integrals
 - b. **Prerequisites:** 020AA1CI2 Analysis 1
 - c. **Required /Selected Elective/Open Elective:** Required
6. **Educational objectives for the course**
 - a. **Specific outcomes of instruction:**
 - Identify, construct, manipulate, compare and classify norms.
 - Study and identify topologies over a normed vector space.
 - Identify open, closed, bounded, unbounded, convex, and arc-connected subsets.
 - Characterize differentiable and integrable functions.
 - Manipulate Lebesgue theorems.
 - b. **PI addressed by the course:**

PI	1.3
Covered	x
Assessed	x

7. **Brief list of topics to be covered**
 - Normed vector spaces: Norms, Geometry of normed vector spaces, topology defined by norms, continuity of applications between 2 normed vector spaces, inner products and norms. (18 Lectures)
 - Differential and integral calculus: Derivatives, approximation of function with real variable, integration and differentiation. Taylor formula, Lebesgue convergence theorems, Euler gamma and beta functions. (18 Lectures)