# Analysis 3

- 1. Course number and name: 020AN3CI4 Analysis 3
- 2. Credits and contact hours: 4 ECTS credits, 2x1:15 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:

Series and summable families, sequences and series of functions, integration and derivation of a series of functions, power aeries, probability and discrete random variables, linear differential equation and systems of the form X'=A(t)X+B(t), method of the constant variation, Lagrange's method.

- **b. Prerequisites:** 020AN2CI3 Analysis 2
- c. Required/Selected Elective/Open Elective: Required

## 6. Educational objectives for the course

- a. Specific outcomes of instruction:
  - Identify, construct, manipulate, compare and classify numerical series, function series and summable families.
  - Study and identify linear differential equations.
  - Study of multi-variables functions and differential forms.
  - Study of probability and random variables over a countable space.

#### b. PI addressed by the course:

PI	1.3
Covered	х
Assessed	х

## 7. Brief list of topics to be covered

- Numerical series and summable families: convergence criteria of convergence of a positive term series, alternating series and summable families. (4 lectures)
- Sequences and series of functions: simple, uniform and normal convergence. (4 lectures)
- Power series: radius of convergence, relation to Taylor series. (4 lectures)
- Differential Equations: equation and systems of the form X'=A(t)X+B(t). (4 lectures)
- Multi-variable functions: partial derivatives, gradient, closed and exact differential forms. Curve-integral. (4 lectures)

- Probability and Random variables over a countable space: Independence, discrete random variables, couple of random variables, mean, variance special random variables (Poisson, geometric,...). (4 lectures)