Analysis 1

- 1. Course number and name: 020AA1CI2 Analysis 1
- 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:

Asymptotic analysis: Taylor series- Integration on a segment: integration and derivation- Riemann's sum- Real and complex series, series with positive terms, convergence and absolute convergence- Combinatorics: Cartesian product, arrangements, combinations, finite sets cardinality, probability on a finite space, Bayes formula, independence, finite random variables.

- b. Prerequisites: None
- c. Required/Selected Elective/Open Elective: Required

6. Educational objectives for the course

a. Specific outcomes of instruction:

- Identify, construct, manipulate, compare and classify functions.
- Study a function locally and near infinity
- Manipulate Riemann integrals of piecewise continuous functions
- Characterize and manipulate numerical series
- Study and manipulate finite probability spaces.

b. PI addressed by the course:

PI	1.3
Covered	х
Assessed	Х

7. Brief list of topics to be covered

- Asymptotic analysis: Comparison of real functions near a given point, Taylor series and their applications (4 lectures)
- Riemann Integral of step and piecewise continuous functions: fundamental theorem of calculus, Taylor- Lagrange theorem, approximation of integral the Riemann's sums (4 lectures)
- Numerical Series: convergence, absolute convergence, comparison of series and operations on series (4 lectures)

- Combinatorics: finite sets, cardinal of a set, number of bijective maps, of combinations (4 lectures)
- Probability on finite spaces: general properties, Bayes formula, independent events (4 lectures)
- Finite random variables: definition, mean, variance, standard deviation, Bernoulli and binomial variables, Bienaymé-Tchebychev inequality (4 lectures)