Università degli Studi di L'Aquila - Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica
Course catalogue

Programme of Course "Analisi Matematica B"

- Code: DT0020
- Type of course unit: Compulsory (Bachelor Degree in Mathematics curriculum Generale)
- Level of course unit: Undergraduate Degrees
- Semester: 1

Number of ects credits: (Bachelor Degree in Mathematics) 9 (workload 225 hours)

Teachers: Donatella Donatelli (donatella.donatelli@univaq.it)

1	**Course objectives**	The goal of this course is to provide a knowledge of the differential and integral calculus for functions of several variables. The student will also develop the ability of solving non trivial problems and exercises by applying the techniques learned. The main concepts will be illustrated, if possible, by developing links with the applications in physics and other sciences, and providing some background on the main historical references.
2	**Course content and learning outcomes (dublin descriptors)**	Topics of the module include: • Functions of several variables: continuity, differential calculus, Taylor expansions. • Implicit functions e local inversion: Dini's theorem and implicit functions theorem. Local inversion theorem. • Optimization of functions of more variables. • Measure and integration. • Curves, curvilinear integrals and differential forms • Surfaces and surface integrals. • Gauss-Green, Stokes and Divergence Theorem. • Metric spaces: compact metric spaces, complete metric spaces. • Sequences of functions: point wise and uniform convergence. Uniform convergence and derivation and integration. On successful completion of this module, the student should : • have deep knowledge of basic properties of differential and integral calculus for vector valued functions. • have knowledge and understanding of differential calculus. • understand and explain the meaning of complex statements using mathematical notation and language; • understand differential and integral calculus for functions of several variables and be aware of potential applications in other fields. • demonstrate skill in mathematical reasoning and ability to conceive a proofs. • demonstrate capacity for reading and understand other texts on related topics.
3	**Course prerequisites**	The student must know the basic notions of numerical sequences and series, functions of one variable and linear algebra contained in the courses of Matematemical Analysis A and Geometry A.
4	**Teaching methodsand language**	Lectures and exercise sessions. **Language**: Italian **Reference textbooks** • C. D. Pagani, S. Salsa, *Analisi Matematica*. Zanichelli. (vol. 1,2)
5	**Assessment methods**	Written and Oral exam.