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

Course catalogue

Page compiled on 19/09/2019

Programme of Course "Analisi Matematica C"

- Code: DT0023
- Type of course unit: Compulsory (Bachelor Degree in Mathematics curriculum Generale)
- Level of course unit: Undergraduate Degrees
- Semester: 2

Number of ects credits: (Bachelor Degree in Mathematics) 6 (workload 150 hours)

Teachers: Francesca Guarguaglini (guarguag@univaq.it)

1	**Course objectives**	The goal of this course is to provide a knowledge of series of functions (in particular power series and Fourier series), the theory of ordinary differential equations and the theory of Lebesgue measure in R^n. The student will also gain the ability of solving non trivial problems and exercises by applying the techniques learned. The main concepts will be illustrated, if possible, introducing links with the applications in physics and other sciences, and providing some background on the main historical references.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: • Series of functions: pointwise and uniform convergence. Continuity, differentiation and integration of series. Power series. Taylor series. • Fourier series: Bessel inequality, pointwise and uniform convergence, integration term by term. • Ordinary differential equations: uniqueness, local existence and extension of the solution of the Cauchy problem. Qualitative behaviour of the solutions of Cauchy problems and exact solution of some differential equations. Linear first order systems and linear equation of order n . . Autonmous systems: stability of the critical points, Liapunov method and linearization method. • Lebesgue measure in R^n: measure of open and close sets, outer and inner measure, Lebesgue-measurable sets. Properties of the Lebesgue measure and comparison with Peano-Jordan one. 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 and ordinary differential equations theory • understand and explain the meaning of complex statements using mathematical notation and language; • understand differential and integral calculus for functions of several variables and of the theory of ordinary differential equations and their connections 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 and several variables and linear algebra contained in the courses of Mathematical Analysis A, Mathematical Analysis B , Geometry 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. 2)

5	**Assessment methods**	Written and Oral exam.