Politecnico di Torino

Academic Year 2010/11 (first time established in A.Y.2007/08)

01LSIJA

Mathematical methods

1st degree and Bachelor-level of the Bologna process in Electronic And Computer Engineering - Vercelli (III FACOLTA' DI INGEGNERIA)

Teacher	Status	SSD	Les	Ex	Lab	Years Stability
Di Scala Antonio Jose'	PA	MAT/03	2	3	0	1

SSD	CFU	Activities	Area context
MAT/05	5	A - Di base	Matematica, informatica e statistica

NOTA: Il programma non e stato modificato rispetto a quello dell'anno accademico 2009/10

Objectives of the course

To provide the fundamental concepts about Fourier and Laplace transforms, distribution theory, integration of complex-valued functions, with some applications to partial differential equations.

Expected skills

At the end of the course the student is expected to be able to compute Fourier and Laplace transforms of a given function, possibly by using methods coming from complex integration theory, and to deal with similar problems in the more general setting of distribution theory. He should be acquainted with some basic examples of partial differential equations and know how to deal with them using Fourier series and Fourier/Laplace transforms.

Prerequisites

Analysis in one and in several variables, as given in the courses of Calculus I-II-III, has to be known in order to deal with the topics of the present course. Basic linear algebra is necessary as well.

Syllabus

Integration theory in the complex plane. Analytic and holomorphic functions. The Cauchy-Riemann conditions. The residue Theorem and its applications to the calculation of real integrals. Fourier and Laplace transform and their main properties. The use of complex integration in computing Fourier and Laplace transforms. Basics of distribution theory, including Fourier series of distributions and Fourier-Laplace transforms of distributions. Laplace and wave equations, basics on Fourier methods for their solution.

Laboratories and/or exercises

There will be class exercises on each part of the course.

Bibliography

Notes.

Revisions / Exam

The exam will consist of a written examination on the topics indicated above. An oral examination can be required as well in addition.

Programma definitivo per l'A.A.2009/10

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