UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

MATHEMATICAL ANALYSIS 2

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	MAT/05 (MATHEMATICAL ANALYSIS)
Department	DEPARTMENT OF ELECTRICAL,COMPUTER AND BIOMEDICAL ENGINEERING
Course	ELECTRONIC AND COMPUTER ENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	2nd semester (07/03/2022 - 17/06/2022)
ECTS	9
Lesson hours	83 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	MORA MARIA GIOVANNA (titolare) - 6 ECTS RONDI LUCA - 3 ECTS
Prerequisites	Calculus I, Geometry and Linear Algebra.
Learning outcomes	The course will provide a comprehensive knowledge of differential and integral calculus for real and vector-valued multivariable functions, and some notions on power series. Priority will be given to the understanding and the ability of applying the definitions and the main results, rather than focusing on the proofs (however, some of them will be discussed in detail). A large number of examples and exercises will be provided: at the end of the course students will be proficient in the main theoretical notions and will be able to make computations involving power series, directional and partial derivatives, multivariable integrals, line and surface integrals.
Course contents	• Power series: definition and main properties; derivation and integration.

	Taylor series. • Multivariable differential calculus. Main topological notions in R^n. Limits and continuity. Partial derivatives, directional derivatives, gradient. Higher order derivatives. Differentiability. Optimization with and without constraints. • Multiple integrals. Integrals in two and three dimensions: definition and main properties; applications to Geometry and Physics. Integral calculus: reduction formulas; change of variables. • Line integrals and surface integrals. Curves in a parametric form. Rectifiable curves and arc-length. Surfaces in a parametric form. Area of a surface; rotation surfaces. Line integrals with respect to the arc-length. Line integrals of vector-fields and applications to Physics. Surface integrals and applications to Physics. The divergence and the curl operators. • Conservative fields. Green Theorem in R^2. Stokes Theorem and divergence theorem in R^3.
Teaching methods	Lectures (hours/year in classroom): 45 Exercise sessions (hours/year in classroom): 38
Reccomended or required readings	M. Bramanti, C.D. Pagani, S. Salsa. Analisi Matematica 2. Zanichelli, Bologna, 2009.
Assessment methods	The exam consists of a (mandatory) written test and an (optional) oral exam, to be taken in the same exam session. In the written test students will be asked to solve some exercises and to answer some theoretical questions. The total amount of time for the written test is at most 3 hours. The outcome of the written test will be communicated by email. The oral exam consists in some questions on the topics of the course, it is optional, however it may be required by the exam committee in some cases.
Further information	The exam consists of a (mandatory) written test and an (optional) oral exam, to be taken in the same exam session. In the written test students will be asked to solve some exercises and to answer some theoretical questions. The total amount of time for the written test is at most 3 hours. The outcome of the written test will be communicated by email. The oral exam consists in some questions on the topics of the course, it is optional, however it may be required by the exam committee in some cases.
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile