Anno Accademico 2021/2022

GEOMETRY AND ALGEBRA	
Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	MAT/03 (GEOMETRY)
Department	DEPARTMENT OF ELECTRICAL,COMPUTER AND BIOMEDICAL ENGINEERING
Course	ELECTRONIC AND COMPUTER ENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	6
Lesson hours	60 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	BISI FULVIO (titolare) - 6 ECTS
Prerequisites	The same mathematics prerequisites for enrollment into the Engineering Faculty. In particular, the following issues are required elementary set theory; basic algebra: monomials/polynomials, polynomial division, equations and inequations (inequalities) of degree 1 or 2, also for fractions of polynomials; functions; basic trigonometry: goniometric functions, trigonometric equations and inequations, double- and half-angle formulae etc., laws for right and oblique triangles; Euclidean basic 2D and 3D geometry, including area and volume formulas for mosto common figures, parallelism and orthogonality between straight

	lines and/or planes, parallelograms.
Learning outcomes	This is a basic course on Linear Algebra and Analytic Geometry. Particular emphasis will be given to the fundamental concepts of Linear Algebra and Analytic Geometry as well as to the application of the latter to concrete numerical problems. A tutoring staff, composed by experienced graduate or undergraduate students, provides an expert help and support for students attending the course.
Course contents	Set and functions. Linear Algebra Vector spaces, vectors of R^n, linear subspaces; linear span of a set of vectors; spanning sets and linear independence, basis, coordinates, and dimension. Operations with matrices, determinant and rank of a matrix, inverse of a matrix. Linear systems, Rouché-Capelli and Gauss elimination method, representation of the set of the solutions of a linear system. Linear mappings between vector spaces, kernel and image, matrix associated with a linear mapping. Eigenvalues and eigenvectors of a linear operator, diagonalisation of a linear operator. Inner product in R^n, orthonormal basis, Gram-Schmidt process. Orthogonal matrices. Real quadratic forms. Spectral theorem: real symmetric matrices and orthogonal diagonalisation. Analytic Geometry. Coordinate systems in 2- and 3-dimensional spaces; straight lines and planes.
Teaching methods	Lectures and exercise sessions at the blackboard.
Reccomended or required readings	F.Bisi, F.Bonsante, S. Brivio. Lezioni di Algebra Lineare con Aplicazioni alla Geometria Analitica. Edizioni La Dotta.
Assessment methods	The final exam consists of two written and an oral test. The first written one deals with theory. The second written one deals with exercises. The oral test deals with both. Under certain specific conditions, the student can be exonerated from oral test.
Further information	http://matematica.unipv.it/ghigi
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile