



GEOMETRY AND ALGEBRA

Enrollment year	2019/2020
Academic year	2019/2020
Regulations	DM270
Academic discipline	MAT/03 (GEOMETRY)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	1st semester (30/09/2019 - 20/01/2020)
ECTS	6
Lesson hours	60 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	STOPPINO LIDIA (titolare) - 6 ECTS
Prerequisites	<p>The contents of the "Preliminary Course of Mathematics":</p> <ol style="list-style-type: none">1. elements of algebraic and polynomial calculus. Polynomials: sum product, divisibility, factorization. Algebraic equations of first and second degree- Ruffini's Theorem.2. Foundations of plane analytic geometry. Coordinates in the plane. Analytic representation of lines, circles, parabolas, ellipses, hyperbolas.3. Concept of function and its graph. Elementary examples, exponential and logarithmic functions.4. Elements of trigonometry. Sin, cos, tan functions. Trigonometric equations.5. inequalities between functions of one variable.
Learning outcomes	<p>The aim of the course is to give to the students the basic notions and techniques of linear algebra and analytic geometry. The scope of the course is for the students to understand the concepts of vector space,</p>

	vector subspace, basis and dimension, matrices, determinants, rank, linear systems and their resolvability, linear maps, diagonalization, scalar product, quadratic forms and their signature. From the practical point of view, the student has gained the skills that enable him to solve simple exercises on the above described concepts.
Course contents	<p>0. (some prerequisites)</p> <ol style="list-style-type: none"> 1. Applied vectors in the 3-dimensional euclidean space, and its geometry. 2. Vector spaces, subspaces, bases and dimension. 3. Matrices, invertibility, determinant and rank. 4. Linear systems and their resolvability. 5. Linear maps and matrices. Matrices of a change of basis. 6. Diagonalization. Eigenvectors and eigenspaces. 7. Metric structure in vector spaces. Real Spectral theorem. 8. Quadratic forms and their applications.
Teaching methods	Traditional lessons and exercise sessions at the blackboard. There will be further exercise sessions (tutorati).
Recommended or required readings	Fulvio Bisi, Francesco Bonsante, Sonia Brivio: Lezioni di Algebra Lineare con Applicazioni alla Geometria Analitica. Edizioni La Dotta - Casalecchio di Reno (BO)
Assessment methods	The exam is composed of a written part (which itself has a first more theoretical part and a second computational one) and an oral part which is mandatory if the student has a written grade between 15 and 17, and in other cases at the discretion of the teacher.
Further information	More informations at the webpage www.stoppino.it
Sustainable development goals - Agenda 2030	\$Ibl legenda sviluppo sostenibile