



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria		
ACADEMIC YEAR	2016/2017		
BACHELOR'S DEGREE (BSC)	COMPUTER AND TELECOMMUNICATION ENGINEERING		
INTEGRATED COURSE	GEOMETRY AND ALGEBRA - INTEGRATED COURSE		
CODE	18032		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	MAT/03, MAT/02		
HEAD PROFESSOR(S)	VALENTI ANGELA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	VALENTI ANGELA	Professore Ordinario	Univ. di PALERMO
	GARBO GIOVANNI	Professore Ordinario	Univ. di PALERMO
CREDITS	12		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	GARBO GIOVANNI		
	Wednesday	15:00 - 17:00	Presso il mio ufficio II piano Ed. 9 Viale delle Scienze U223
	VALENTI ANGELA		
	Monday	15:00 - 17:00	Microsoft teams
	Wednesday	15:00 - 17:00	Microsoft teams

DOCENTE: Prof.ssa ANGELA VALENTI

PREREQUISITES	Basic knowledge of elementary algebra, Euclidean geometry and analytic geometry of the plane .First elements of mathematical logic : concepts of definition, theorem , demonstration , role of examples and counterexamples .
LEARNING OUTCOMES	The knowledge and understanding. The student at the end of the course will gain the knowledge on key issues, motivation and basic methods of linear algebra, analytic geometry, arithmetic of integers and algebraic structures. Applying knowledge and understanding. The student will be able to use the methods and the conceptual tools of Geometry and Algebra to solve problems and to identify an algebraic-geometric entity under some conditions. It will be also able to apply the acquired knowledges in more general areas. Making judgments The student will be able to evaluate the difficulty of a problem and to choose the simplest strategies for dealing with the typical problems of algebra and geometry, recognizing in this way the usefulness of the tools learned during the course. Communication skills The student will acquire the logical-deductive rigor and the abilities to express the contents of the course. In particular, he will be able to state and to prove theorems, but also to discuss the issues concerning the statement of a theorem and its applications. Learning skills The course helps with other math courses to provide the basis of mathematical and scientific language. The student will have learned the interactions between the methods acquired in the course and mathematical models that may arise in other parallel courses.
ASSESSMENT METHODS	The assessment methods will be focused on the evaluation of the results attended (see below) in accord with the describers of Dublino. The final vote will be given in thirtieths and it will range from 18/30 to 30/30 with praise. The aim of the examination is to test the level of achievement of knowledge, skills and abilities indicated . The examination is divided into two parts : written test and oral exam . The written test will concern the application of the arguments studied during the course. It will consist of exercises that show the reached ability of the students in the use of the methods of algebra and geometry. The oral exam will deal with the theoretical aspects of the course topics . It will aimed to verify the acquired knowledges , the property of mathematical language, the mathematical rigor and the logical deductive properties. The final mark takes into account both tests .
TEACHING METHODS	Lectures. Excercices.

MODULE GEOMETRY

Prof. GIOVANNI GARBO

SUGGESTED BIBLIOGRAPHY

G.Vaccaro – A.Carfagna - L.Piccolella, Lezioni di geometria e algebra lineare (Zanichelli)

G.Vaccaro - A.Carfagna - L.Piccolella , Complementi ed esercizi di geometria e algebra lineare (Zanichelli)

Marco Abate – Chiara de Fabritiis, Geometria analitica con elementi di algebra lineare, Seconda edizione McGraw-Hill – Milano (2010)

AMBIT	50283-Matematica, informatica e statistica
INDIVIDUAL STUDY (Hrs)	96
COURSE ACTIVITY (Hrs)	54

EDUCATIONAL OBJECTIVES OF THE MODULE

The course aims to provide the students with a basic knowledge of geometry and linear algebra. The course focus on the techniques to work with matrices, vectors and vector spaces. Linear systems and the solutions spaces, homomorphisms and isomorphisms of vector spaces, vector and affine subspaces, eigenvalues and eigenvectors of endomorphisms will be also analyzed.

SYLLABUS

Hrs	Frontal teaching
5	Vector spaces
4	Matrices
3	Systems of linear equations
3	Linear mappings
4	Analytic geometry of plane
4	Analytic geometry of space
3	Conics
3	Quadrics
Hrs	Practice
25	Exercises on course topics

MODULE ALGEBRA

Prof.ssa ANGELA VALENTI

SUGGESTED BIBLIOGRAPHY

G. M. Piacentini Cattaneo, Algebra, un approccio algoritmico, Decibel -Zanichelli
 A. Facchini , Algebra e Matematica Discreta, Decibel- Zanichelli
 D. Dikranjan, M. S. Lucido Aritmetica e algebra, Liguori

AMBIT	10655-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	96
COURSE ACTIVITY (Hrs)	54

EDUCATIONAL OBJECTIVES OF THE MODULE

To Know the basic elements of Algebra and the relative applications. Set up an hypothetical-deductive reasoning.

SYLLABUS

Hrs	Frontal teaching
8	Number theory . Natural numbers . Integers. The principle of induction. Divisibility. Greatest common divisor . Prime numbers. Congruences . Equations of congruence . Systems of congruences and the Chinese remainder theorem . theorem Fermat .
2	Combinatoris: Permutations , Combinations , Dispositions (with and without repetition) . Binomial number.
5	Groups . Subgroups . cyclic groups . normal subgroups . quotient group. Lagrange's theorem. Homomorphisms of groups .
7	Rings. Subrings. Ideals. Prime Ideals and maximal ideals . Homomorphisms and isomorphisms. Polynomials ring .
6	Finite fields . Characteristic of a field . Algebraic extension. Symbolic extension. Splitting field. Primitive elements and primitive polynomials .
Hrs	Practice
26	Exercises on the topics of the lectures .