UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Matematica e Informatica
ACADEMIC YEAR	2018/2019
BACHELOR'S DEGREE (BSC)	MATHEMATICS
SUBJECT	ALGEBRA 3
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50198-Formazione Teorica
CODE	01167
SCIENTIFIC SECTOR(S)	MAT/02
HEAD PROFESSOR(S)	LA MATTINA DANIELA Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	94
COURSE ACTIVITY (Hrs)	56
PROPAEDEUTICAL SUBJECTS	01166 - ALGEBRA 2
MUTUALIZATION	
YEAR	3
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**LA MATTINA DANIELA** Wednesday 14:30 16:30 Dipartimento di Matematica e Informatica, Via Archirafi 34, Palermo, Studio 114 Friday 12:30 13:30 Dipartimento di Matematica e Informatica, Via Archirafi 34, Palermo, Studio 114

DOCENTE: Prof.ssa DANIELA LA MATTINA

PREREQUISITES	Basic knowledge of the theory of groups and the theory of fields.
LEARNING OUTCOMES	Knowledge and understanding Knowledge and understanding in the framework of the Galois theory, based on the knowledge acquired in the courses of Algebra 1 and Algebra 2. It acquires a rigorous method of reasoning and the ability to use the specific language of this discipline and its methods . This knowledge is achieved through an active participation of the student in the class. Applying knowledge and understanding. Ability of understanding and solving by himself moderately difficult problems inherent in the topics of the course and ability to reproduce similar proofs to those presented in the course. Making judgements To be able to evaluate by himself the implications given by the knowledge acquired, to analyze in a critical way different texts and to construct and develop logical arguments. Communication To be able to state and prove in a correct way the main results presented in the course. Lifelong learning skills To be able to understand the content of courses in mathematics, by mean of the knowledge acquired in the course.
ASSESSMENT METHODS	The assessment method consists in an oral exam aimed to verify that the student has acquired the skills and the disciplinary knowledge provided by the course. The assessment is expressed in thirtieths. The students following the course have the possibility of taking a test. The valuation of the test is part of the final assessment. Description of evaluation methods - Excellent Rating: 30-30 cum laude vote. Outcome: excellent knowledge of the topics, excellent properties of language, good analytical ability, the student is able to apply knowledge to solve problems proposed. - Very good Rating: 26-29 vote. Outcome: Good mastery of the subjects, full language ability, the student is able to apply knowledge to solve problems proposed. - Good Rating: 24-25 vote. Outcome: Basic knowledge of the main topics, discrete properties of language, with limited ability to independently apply the knowledge to the solution of the proposed problems. - Satisfactory Rating: 21-23 vote. Outcome: the student does not have full command of the main teaching subjects but has the knowledge, satisfactory properties of language, exiguous ability to independently apply the knowledge gained. - Sufficient Rating: 18-20 vote. Outcome: minimum basic knowledge of the main teaching and technical language issues, very little ability to independently apply the knowledge gained. - Insufficient rating. Outcome: the student does not have an acceptable knowledge of the contents of the topics covered in the course.
EDUCATIONAL OBJECTIVES	To develop the Galois theory also in order to prove that the general equation of degree grater than four is not solvable by radicals.
TEACHING METHODS	Lessons, exercise sessions
SUGGESTED BIBLIOGRAPHY	Testi di riferimento: -T.W. Hungerford, Algebra, Springer-Verlag,1980. -I. Stewart, Galois theory, Taylor & Francis, 2003. Testi consigliati: M. Artin, Algebra, Bollati Boringhieri, 1997. S. H. Weintraub, Galois theory, Springer-Verlag, 2005.

SYLLABUS

Hrs	Frontal teaching
8	Elements of field theory. Splitting fields and algebraic closure of a field. Galois group of a field extension. The Fundamental Theorem of Galois Theory.
8	Normal extensions, separable extensions and purely inseparable extensions. Galois extensions. Symmetric functions. Elementary symmetric functions. The fundamental theorem of algebra. The Galois group of a polynomial.
8	Transitive subgroups of the symmetric group. Cyclic extensions. Cyclotomic extensions. Solvable groups.
8	Radical extensions. The general equation of degree n. Solvable equations by radicals. Abel-Ruffini Theorem.

Hrs	Practice
8	Examples and exercises on Galois groups of field extensions and the fundamental theorem of Galois Theory.
8	Examples and exercises on normal, separable and Galois extensions and on cyclotomic extensions.
8	Examples and exercises on cyclotomic and radical extensions and on solvable equations by radicals.