Anno Accademico 2015/2016

ALGEBRA 2

Enrollment year	2014/2015
Academic year	2015/2016
Regulations	DM270
Academic discipline	MAT/02 (ALGEBRA)
Department	DEPARTMENT OF MATHEMATICS "FELICE CASORATI"
Course	MATHEMATICS
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	2nd semester (01/03/2016 - 10/06/2016)
ECTS	6
Lesson hours	56 lesson hours
Language	ITALIAN
Activity type	ORAL TEST
Teacher	FREDIANI PAOLA (titolare) - 6 ECTS
Prerequisites	The courses of Linear algebra and Algebra 1.
Learning outcomes	The course is an introduction to Galois theory, with the necessary complements of group theory and of the theory of modules over a ring.
Course contents	Modules over a ring. Group actions. Sylow theorems. Soluble groups. Field extensions. Splitting fields. Galois theory. Extended summary Modules over a ring. Structure of a finitely generated module over a principal ideal domain. Applications: Jordan canonical form and rational canonical forms. Group actions. Sylow theorems and applications. Semidirect products. Soluble groups.

	Field extensions. Splitting fields: existence and unicity. Galois correspondence. Normal extensions. Separable and inseparable extensions. Galois extensions. The fundamental theorem of Galois theory. Primitive Element Theorem. Galois theory for finite fields. Cyclotomic polynomials and their irreducibility. Galois group of a cyclotomic polynomial. Cyclic extensions. Polynomial solvable by radicals. The general polynomial of degree >4. Equations with integer coefficients which are not solvable by radicals. Cubics and quartics.
Teaching methods	Lectures and exercise sessions
Reccomended or required readings	I.N. Herstein, Algebra, terza edizione, Editori Riuniti, Roma 1993. D.J.H. Garling, A Course in Galois Theory, Cambridge University Press C. Procesi, Elementi di Teoria di Galois, Zanichelli M.F. Atiyah, I.G. MacDonald, Introduzione all'algebra commutativa, Feltrinelli, 1981. M. Artin, Algebra, Bollati Boringhieri, Torino 1997. I.N. Stewart, Galois Theory, second edition, CRC Press.
Assessment methods	Written and oral exam
Further information	Written and oral exam
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile