UNIVERSITÀ DI PAVIA

Anno Accademico 2020/2021

ALGEBRA 2

Enrollment year	2019/2020
Academic year	2020/2021
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 (01/03/2021 - 11/06/2021)
ECTS	6
Lesson hours	56 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	CANONACO ALBERTO (titolare) - 6 ECTS
Prerequisites	The courses of Linear algebra and Algebra 1.
Learning outcomes	The course is an introduction to Galois theory, with some complements of group theory and of the theory of modules over a ring.
Course contents	Modules over a ring; submodules, module homomorphisms and quotient modules. Products and direct sums of modules; free modules. Noetherian modules; decomposability of modules; simple modules and semisimple modules. The structure theorem for finitely generated modules over a principal ideal domain. Finitely generated abelian groups. Group actions on sets; group representations. The class equation. Cauchy theorem and Sylow theorem. Simple and soluble groups. Semidirect products of groups. Field extensions; algebraic and transcendental elements. Ruler and compass constructions. Splitting fields of polynomials. Algebraic closure of a field. Normal, separable and Galois extensions. Fixed fields and

	Galois groups; the fundamental theorem of Galois theory. Galois theory for finite fields. Polynomials solvable by radicals.
Teaching methods	Lectures and exercise sessions
Reccomended or required readings	Notes provided by the teacher. I.N. Herstein, "Algebra", Editori Riuniti. M. Artin, "Algebra", Bollati Boringhieri. P. Aluffi, "Algebra: chapter 0", American Mathematical Society. J.S. Milne, "Group Theory", http://www.jmilne.org/math/CourseNotes/gt.html. D.J.H. Garling, "A Course in Galois Theory", Cambridge University Press. I.N. Stewart, "Galois Theory", CRC Press. J.S. Milne, "Fields and Galois Theory", http://www.jmilne.org/math/CourseNotes/ft.html.
Assessment methods	The exam consists of a written test, during which the student must solve some exercises, and of an oral examination, during which the student must answer some questions, mainly of a theoretical nature.
Further information	
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile