UNIVERSITÀ DI PAVIA

Anno Accademico 2014/2015

HIGHER ALGEBRA	
Enrollment year	2014/2015
Academic year	2014/2015
Regulations	DM270
Academic discipline	MAT/02 (ALGEBRA)
Department	DEPARTMENT OF MATHEMATICS "FELICE CASORATI"
Course	MATHEMATICS
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	1st semester (01/10/2014 - 15/01/2015)
ECTS	6
Lesson hours	48 lesson hours
Language	ITALIAN
Activity type	ORAL TEST
Teacher	PERNAZZA LUDOVICO (titolare) - 3 ECTS CANONACO ALBERTO - 3 ECTS
Prerequisites	The contents of the courses of Algebra 1, Algebra 2 and Linear Algebra
Learning outcomes	An introduction to the fundamental notions of Commutative Algebra and Algebraic Number Theory.
Course contents	Review of previously known results on commutative rings and ideals; modules and operations on them; tensor product of modules. Localization of rings and modules. Artinian and Noetherian rings and modules; Krull dimension of a ring; length of a module. Integral dependence; integral extensions; integral closure of a domain; valuation rings; discrete valuation rings; Hilbert's Nullstellensatz. Dedekind domains: fractional ideals, unique factorization of ideals; ideal class group. Number fields: ring of integers; norm, trace and discriminant; quadratic

	reciprocity. Lattices, Minkowski's lemma and Lagrange's four-squares theorem. Finiteness of the class number and unit theorem.
Teaching methods	Lectures
Reccomended or required readings	M.F. Atiyah, I.G. MacDonald: "Introduction To Commutative Algebra", Addison-Wesley, 1994. G.J. Janusz: "Algebraic Number Fields", American Mathematical Society, 2005. I. Kaplanski: "Commutative Rings", University of Chicago Press, 1974. S. Lang: "Algebraic Number Theory", Springer, 1994. H. Matsumura: "Commutative Ring Theory", Cambridge Univerity Press, 1989. J.S. Milne: "Algebraic Number Theory", 2012.
Assessment methods	Oral exam
Further information	Oral exam
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile