UNIVERSITÀ DI PAVIA

Anno Accademico 2014/2015

LOGIC - A

Enrollment year	2012/2013
Academic year	2014/2015
Regulations	DM270
Academic discipline	M-FIL/02 (LOGIC AND PHILOSOPHY OF SCIENCE)
Department	DEPARTMENT OF DRUGS SCIENCES
Course	PHARMACY
Curriculum	PERCORSO COMUNE
Year of study	3°
Period	2nd semester (02/03/2015 - 19/06/2015)
ECTS	3
Lesson hours	24 lesson hours
Language	ITALIAN
Activity type	ORAL TEST
Teacher	MINARI PIERLUIGI (titolare) - 9 ECTS
Prerequisites	- Module A: no prerequisites - Module B: module A (or corresponding knowledges)
Learning outcomes	Aim of the course is introducing students to (i) basic tools and techniques for the verification of the correctness of logical inferences (truth tables, refutation trees, natural deduction for first order logic FOL), (ii) the main notions of logical semantics (model, truth in a model, logical consequence), (iii) some key metalogical results (completeness theorem for FOL, with

	applications), (iv) non classical (in particular: modal and intuitionistic) logic and Kripke semantics; (v) the basic notions of computability theory (Turing machines).
Course contents	(A.i) Logical truth, logical consequence, consistency: intuitive notions. (A.ii) Logical form. (A.iii) Propositional and predicate logic: basics (classical connectives and truth-tables; informal semantics of quantification). (A.iv) Propositional and predicate logic: refutation trees. Labelled trees; refutation trees; counterexample extraction. Elementarily valid formulas and inferences. (A.v) Classes, relations, functions, cardinality; Cantor's theorems. (A.vi) Traditional logic (categorical propositions; traditional square of oppositions; syllogisms). (B.i) Computability: basics (informal notions of algorithm, decidability, effective enumerability, computability; Turing machines). (B.ii) Elementary languages and model-theoretic semantics (inductive definitions and proofs by induction; elementary languages; correspondence theory of truth; semantic paradoxes. Tarskian semantics: structures and interpretations; satisfiability; logical consequence). (B.iii) Syntax of elementary logic (informal notion of deduction; "Frege-Russell-Hilbert" vs "Gentzen" paradigms; axiomatic calculi; Gentzen's natural deduction calculus NK). (B.iv) Completeness theorem for FOL. Compactness and Löwenheim-Skolem theorems. Applications. (B.v) Modal logic and Intuitionistic logic. Kripke semantics.
Teaching methods	Lectures

Reccomended or required readings	- A. Cantini, P. Minari, Introduzione alla Logica. Mondadori Education 2009. - D. van Dalen, Logic and Structure. 5th ed., Springer 2013. - Lecture notes (online)
Assessment methods	Oral Examination
Further information	Oral Examination
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile