COURSE PRESENTATION FORM – ACADEMIC YEAR 2010/2011

COURSE NAME	**Computational Logic**
COURSE CODE	72012 (MSc 270) / 70216 (BSc, MSc 509) / 70159 (BSc Old)
LECTURER	Sergio Tessaris
TEACHING ASSISTANT	Camilo Thorne
TEACHING LANGUAGE	English
CREDIT POINTS	8
LECTURE HOURS	48
EXERCISE HOURS	24
TIME SPAN	21.02.2011 - 11.06.2011
TIME TABLE	See Timetable Page
OFFICE HOURS LECTURER	During the lecture time span: Wed 11:00-13:00, Faculty of CS, POS Building, piazza Domenicani 3, office 2.04. Outside of the lecture time span by previous email appointment.
OFFICE HOURS TEACHING ASSISTANT	TBD
PREREQUISITES	Students should be familiar, at least at an introductory level, with propositional and first-order logic, and basic algorithms. In particular, knowledge of syntax and semantics of propositional and first-order logic, relational algebra and of the fundamental concepts of the theory of NP-completeness are required. At FUB, this material is taught in the courses Logic, Introduction to Databases and Theory of Computing.
OBJECTIVES	The objective of this course is to offer a comprehensive introduction of the methods and techniques in Computational Logic. Although the course has a formal background, it includes a strong practical part in using automated tools and with a review of applications.

SYLLABUS	• Computational logic, motivations and importance of the field
	• Propositional and first-order logic: deduction, proof theory, automated theorem proving
	  ◦ Resolution
	  ◦ Tableaux
	  ◦ DPLL ("Davis-Putnam") style approaches for SAT
	• Handling Equality
	• Logic as a query language

TEACHING FORMAT Lectures, exercises in class and assignments.

ASSESSMENT The final mark will be based on assignments and on a written exam.

The actual final mark will be computed as the weighted average of the assignments (40%) and exam (60%) marks.

Assignments must be submitted at least one week before the written examination and they will be taken into account for all the subsequent exam session; so students are not requested to resubmit them.

READING LIST Textbook:

- Harrison, J. 2009 Handbook of Practical Logic and Automated Reasoning. Cambridge University Press.

Additional readings:

- Gallier, J. H. 1986 Logic for Computer Science: Foundations of Automatic Theorem Proving. Harper & Row Publishers.
- Fitting, M. 1996 First-Order Logic and Automated Theorem Proving (2nd Ed.). Springer-Verlag New York, Inc.

SOFTWARE USED Functional and declarative programming languages for practical exercises and assignments.

LEARNING OUTCOME The students will acquire theoretical and practical knowledge in logic, knowledge representation, automatic theorem proving, logic programming and deduction systems.
In particular, after the course, students will be able to

- formalise statements in logic and apply logic-based systems to prove them;
- formulate theoretical statements about logical formalisms and to prove/disprove them;

understand the main algorithmic techniques for automated reasoning.

COURSE PAGE http://www.inf.unibz.it/~tessaris/teaching/CL.html