

LOGIC, INFORMATION AND COMPUTATION

(AS) {LGIC}

L/R 010. (PHIL005) Ideas in Logic and Computation. (B) Weinstein. This is a Formal Reasoning course.

This course provides an introduction to some of the fundamental ideas of logic and computation. Topics will include truth functional logic, quantificational logic, and logical decision problems.

210. (MATH340) Applied Mathematics of Information and Computation I. (A) Scedrov, Towsner. Prerequisite(s): MATH 114 or MATH 115 or permission of the instructor.

The first semester of a two-semester course designed to introduce students to a range of mathematical subjects useful in the analysis of information and computation. This course will treat topics chosen from set theory, combinatorics, graph theory, and number theory.

220. (MATH341) Applied Mathematics of Information and Computation II. (M) Scedrov, Towsner. Prerequisite(s): LGIC 210 or permission of the instructor.

The second semester of a two-semester course devoted to mathematical subjects useful in the analysis of information and computation. Topics will be drawn from automata theory, formal languages, computability and complexity, and information theory.

310. (MATH570, PHIL410, PHIL412) Logic I. (C) Scedrov, Towsner, Weinstein. Prerequisite(s): Math 371 or Math 503.

Propositional logic: semantics, formal deductions, resolution method. First order logic: validity, models, formal deductions; Godel's completeness theorem, Lowenheim-Skolem theorem: cut-elimination, Herbrand's theorem, resolution method. Computability: finite automata, Turing machines, Godel's incompleteness theorems. Algorithmically unsolvable problems in mathematics.

SM 320. (MATH571, PHIL412) Logic II. (C) Scedrov, Towsner, Weinstein. Prerequisite(s): LGIC 310 or permission of the instructor.

The second semester of a two-semester course on the fundamental results and techniques of mathematical logic. Topics will be drawn from model theory, proof theory, recursion theory, and set theory. Connections between logic and algebra, analysis, combinatorics, computer science, and the foundations of mathematics will be emphasized.