

Achille Varzi

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Office hours: M 12:00–2:00

Website: http://www.columbia.edu/~av72/non_classical_logics

General Outline: An introductory survey of the main alternatives to classical logic, i.e., theories that deviate from the classical account of logical validity (as studied e.g. in the prerequisite course V3411/G4415, *Introduction to Symbolic Logic*). The focus is on theories that depart from classical logic with regard to the principle of *bivalence* (every statement is either true or false) or the principle of *non-contradiction* (no statement is both true and false), or both—including sentential and predicate versions of many-valued logics, fuzzy logics, partial logics, free logics, inclusive logics, and paraconsistent logics. Details of the semantics and proof-theories of these logics are considered along with the relevant philosophical motivations.

Prerequisites: One term of formal logic (V3411/G4415 *Introduction to Symbolic Logic* or G4801 *Mathematical Logic I*) and a willingness to master technicalities and to work at a certain level of abstraction.

Requirements: The final grade is determined as follows: (a) class participation (15%); (b) two take home tests (20% each); (c) final examination/paper (45%).

Readings: There is no textbook for this class. Instead, required readings are assigned for each session and lecture notes made available through the course website.

Schedule (tentative):

Sept 2 Introduction: Classical Logic and “Deviant” Logics

- S. Haack: *Deviant Logic*, Chapter 1: “‘Alternative’ in ‘Alternative Logic’”
- W. V. O. Quine: *Philosophy of Logic*, Chapter 6: “Deviant Logics”

Sept 9 The Law of Bivalence

- *Lecture Notes 1*
- Aristotle: *De Interpretatione*, §9
- J. B. Rosser & A. R. Turquette: *Many-Valued Logics*, Chapter 1: “Introduction”

Sept 16 Many-Valued Logics, I: Introduction

- *Lecture Notes 2*
- N. Rescher: *Many-Valued Logic*, Chapter 1: “A Historical Conspectus”
- J. Łukasiewicz: “On Three-Valued Logic”

- Sept 23 Many-Valued Logics, II: Developments
– *Lecture Notes 3*
– Siegfried Gottwald, “Many-Valued Logic” (Stanford Encyclopedia)
– Petr Hajek, “Fuzzy Logic”, Sections 1–6 (Stanford Encyclopedia)
- Sept 30 Many-Valued Logics, III: Applications
– *Lecture Notes 4*
– M. Tye, “Sorites Paradoxes and the Semantics of Vagueness”
- Oct 7 Supervaluationism
– *Lecture Notes 5*
– K. Fine: “Vagueness, Truth, and Logic”, Sections 1–4
- Oct 14 Free Logics, I: Introduction
– *Lecture Notes 6*
– C. Lejewski, “Logic and Existence”
– K. Lambert, “Free Logic and the Concept of Existence”
- Oct 21 Free Logics, II: Theories
– *Lecture Notes 7*
– E. Bencivenga: “Free Logic”
– B. Van Fraassen: “Singular Terms, Truth-Value Gaps, and Free Logic”
- Oct 28 Free Logics, III: Developments
– *Lecture Notes 8*
– K. Lambert, “A Theory of Definite Descriptions”
- Nov 11 The Principle of Non-Contradiction
– *Lecture Notes 9*
– G. Priest, “What’s So Bad About Contradictions?”
– A. Varzi: “Conjunction and Contradiction”
- Nov 18 Paraconsistent Logics, I: Adjunctive Theories
– *Lecture Notes 10*
– G. Priest: “Logic of Paradox”
- Nov 25 Paraconsistent Logics, II: Non-Adjunctive Theories
– *Lecture Notes 11*
– Jaskowski, S. “Propositional Calculus for Contradictory Deductive Systems”
– A. Varzi: “Supervaluationism and Paraconsistency”
- Dec 2 Other Topics and Conclusion
– *Lecture Notes 12*