

## *Philosophy of Notation: 19th-century Logic*

Fridays, 11:35am–2:25pm, Leacock 927

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**Course description.** In recent years philosophers of mathematics have increasingly turned their attention to mathematical practice, i. e., how mathematics is actually being done. A characteristic feature of mathematics and other theoretical sciences is the extensive use of distinctive notations. They have been considered as ‘epistemic tools’ (Klein 2002), ‘objects-to-think-with’ (Tolchinsky 2003), or ‘cognitive technologies’ (Dutilh Novaes 2012) that can be manipulated almost like physical objects (Landy et al. 2014). According to this conception, the influence between thoughts and notations goes *both* ways. That is, notations do not merely represent previously thought or spoken ideas, but through their use we also change our way of thinking. Despite the ubiquitous use of notations and the fact that the term ‘philosophy of notation’ was coined in 1885 by C. S. Peirce in his “On the Algebra of Logic: A Contribution to the Philosophy of Notations”, however, the question of *how* particular notations contribute to mathematical thinking and progress has rarely been investigated in a systematic fashion. The primary objective of this seminar is to look for new insights into the relation between symbolic notations and mathematical thought.

In particular, we will focus on the notations of *propositional logic* that have been developed in the second half of the 19th century. We will carefully study the writings in the tradition of the *Algebra of Logic*: George Boole, and his followers Jevons, Venn, and Schröder. Time permitting, we shall also discuss other authors, such as Peirce, Frege, and Peano. For each of these authors we will investigate the historical, cognitive, and pragmatic aspects of the notational systems they employed.

**Prerequisites.** Seminars are open only to graduate students and advanced undergraduate students, or by written permission of the instructor.

**Reading materials** will be made available on myCourses and in the library course reserve.

**Requirements & grading.** It is required that students prepare for and attend the meetings, and participate in the discussions. The *final grade* depends on weekly discussion notes (20%), in-class presentations (incl. selection of readings and preparation of a handout) (30%), and a 4000–5000 word term paper (50%). Late papers will be downgraded at a rate of 1/3 of a grade per day (e. g., from A- to B+, C to C-), including weekend days/holidays. Requests for extensions will be considered only when requested at least 24 hours before the paper or discussion note is due and substantiated by a written note.

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