Phil/Math 375 A01: Philosophy of Mathematics

Syllabus

Instructor: Dr. Audrey Yap (ayap@uvic.ca)
Office: CLE B307
Phone: 721-7510
Office Hours: Thursdays: 11:00-1:00 and by appointment
Class Information: TWF in CLE A308
Course Website: Through CourseSpaces. [http://coursespaces.uvic.ca](http://coursespaces.uvic.ca)
Prerequisites: One of Phil 203, 370, Math 122 or 360.

Textbook: Alexander George and Daniel Velleman, Philosophies of Mathematics,
Some additional readings online. Note that access to JSTOR requires a campus internet connection.

Course Objectives:

The goal of this course is to give students a historical introduction to current problems in the Philosophy of Mathematics, by looking at the mathematical developments which led to those problems. The importance of certain logical results which affected views about the nature of mathematics will also be emphasized. Even though this is not a logic course, an understanding of certain technical results will be required, as well as the impact of those results on philosophy.

Coursework:

You must complete five assignments over the course of the semester, each worth 15% of the final grade. Assignments will be posted roughly every other week, and will be due in class on the specified due date. Note that I will post six assignments, but will only grade five of them. Each assignment will have a writing assignment option and a problem set option, and you can choose which one of these you prefer. However, of the five assignments you do, at least one must be a writing assignment and one must be a problem set. A final project/paper worth 25% will be assigned at the end of the semester, due after classes are over. Late work will lose 5% for every 24 hours past the due date until they are received. Email submissions will not be accepted except where there are extenuating circumstances. Exceptions to these rules will only be made in the case of documented illness or other circumstances which interfere with the timely completion of the assigned work. Such documentation must be received within a week of the due date. Plagiarised work will not be given credit. For more information on plagiarism, see the University Calendar.
Schedule of Readings

• Week One: Jan 6, 7, (no class Jan 9th)
  Topic: Introduction to the Philosophy of Mathematics.
  Reading: George and Velleman, Introduction.

• Week Two: Jan 13, 14, 16
  Topic: Frege's Logicism.
  Reading: George and Velleman, Chapter 2.
  Gottlob Frege, excerpts from The Foundations of Arithmetic.

• Week Three: Jan 20, 21, 23
  Topic: Frege's Logicism.
  Reading: George and Velleman, Chapter 2.
  Gottlob Frege, excerpts from The Foundations of Arithmetic.
  Bertrand Russell, “Letter to Frege”
  HW1 due Jan 23

• Week Four: Jan 27, 28, 30
  Topic: Set Theory.
  Reading: George and Velleman, Chapter 3 (44-59, 81-85)

• Week Five: Feb 3, 4, 6
  Topic: Set Theory and the Continuum Hypothesis.
  Reading: Kurt Gödel, “What is Cantor's Continuum Problem?”
  HW2 due Feb 6

• Week Six: Feb 17, 18, 20
  Topic: Developing the Natural Numbers
  Reading: George and Velleman, Chapter 3 (59-81)

• Week Seven: Feb 24, 25, 27
  Topic: Intuitionism
  Reading: George and Velleman, Chapter 5
  HW3 due Feb 27th

• Week Eight: Mar 3, 4, 6
  Topic: Hilbert's Program
  Reading: George and Velleman, Chapter 6
  HW4 due Mar 6
• Week Nine: Mar 10, 11, 13
  Topic: Gödel Numbering
  Reading: George and Velleman, Chapter 7

• Week Ten: Mar 17, 18, 20
  Topic: Gödel’s First Incompleteness Theorem
  Reading: George and Velleman, Chapter 7
  Peter Smith, “PA is incomplete”
  HW5 due Mar 20

• Week Eleven: Mar 24, 25, 27
  Topic: Gödel’s Second Incompleteness Theorem.
  Reading: George and Velleman, Chapter 7
  Peter Smith, “Gödel’s Second Theorem for PA”
  HW6 due Mar 27

• Week Twelve: Mar 31, Apr 1
  Topic: Philosophical Implications of Incompleteness.
  Reading: Kurt Gödel, “Some basic theorems on the foundations of mathematics and their implications”
  Final Project/Paper due Apr 7th.

Note: This syllabus is tentative, and should only be used to give a rough guide to the course schedule. Additional readings may be assigned, and dates may be changed if necessary.