We acknowledge and respect the lək̓ʷəŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

Philosophy of Mathematics

PHIL375/MATH375 (A01)

Introduces problems in the philosophy of mathematics. Topics may include the nature of mathematical objects, the status of the infinite in mathematics, the relationship between mathematics and natural science/physical reality.

OUTCOMES	Improve philosophical skills (RUBRIC) with training on philosophy of mathematics. Earns 1.5 units.
PREREQUISITES	PHIL203, PHIL304A, PHIL370, MATH122, or MATH360.
INSTRUCTION	Monday & Wednesday 2:30-3:50PM COR B111 **FACE-TO-FACE**
INSTRUCTOR	Professor Mike Raven (raven@uvic.ca • raven.site) **OFFICE HOURS** • Tuesday 1:00-2:30PM CLE B323 (or by appointment)
LMS	bright.uvic.ca/d2l/home/372055 (Consult for updates and current course documents.)
TEXTS	**REQUIRED** • Frege, *The Foundations of Arithmetic* trans. Austin (Wiley-Blackwell) **REQUIRED** • Shapiro, *Thinking about Mathematics* (Oxford)

EVALUATION

GRADES: Completing all essential work (▶) completes the course. Omitting essential work earns a failing N course grade. Grades earned are assessed for craftsmanship (RUBRIC).

WORK			
▶	INTEGRITY	Integrity in Practice	DUE: LMS; ▶INT on SCHEDULE
▶	PROBLEM SETS [1/2]	3 short essay assignments	DUE: LMS; ▶PS on SCHEDULE
▷	CHECKPOINTS [1/3]	Best 15 of 22 submissions	DUE: in class; ✓ on SCHEDULE
▷	ENGAGEMENT [1/6]	Weekly forum contribution: ≥6 posts and ≥6 replies for the term.	

GRACE POINTS: A **grace point** delays the due date of an essential work by 1 day. Each student begins with 5 grace points. These may be used in any combination without justification, but cannot be reused or traded. To use, state the number used when submitting your work.

LATENESS: Submissions are penalized 5% per day past the due date. Submissions received after 5 days past the original due date become pass(50)/fail(49) and are not entitled to feedback.

POLICIES

RESPECT: Enrolling binds you to a social contract with your instructor and classmates. Create a respectful, inclusive, and productive learning environment. Don't bully or distract others. Use devices only for class purposes. No guests without instructor's permission.

PREPARE: Know course documents. Read texts before class. Budget time for email replies.

ENGAGE: Class attendance is expected. Use office hours and tutorials.

INTEGRITY: Know UVic's **academic integrity** policies. GenAI is prohibited (unless explicitly allowed).

PLANS: Academic concessions must be by official request. Accommodation of religious observance must be in advance. Inform instructor of CAL plans (these are not blanket extensions and do not replace grace points, concessions, or other accommodations).

PRIVACY: Classes are not recorded/streamed. No unauthorized recording/streaming.

COPYRIGHT: Course content/materials are protected by copyright law.

INFO: Information for all students | student conduct | non-academic student misconduct | equity and human rights | sexualized violence | discrimination and harassment

RESOURCES: Learn Anywhere | Student Wellness | IACE | Ombudsperson

SCHEDULE

Required texts (•) *must* be read *before* each class. **Optional texts** (▫) are also most usefully read *before* each class. Dates are tentative; consult LMS for updates. See www.uvic.ca/calendar/dates/ for important dates (last add/drop dates).

HISTORY • Shapiro, *Thinking About Mathematics*, **ch. 3-4**

SEP 4 • Introduction

SEP 9 ✓01 • Euclid, *Elements*, **Book 1: Definitions, Postulates, Common Notions, Propositions 1-4,18,32,47**

SEP 11 ✓02 • Kant, *Prolegomena to Any Future Metaphysics*, **pp. 15-22,32-38**

SEP 16 ✓03 • Mill, *A System of Logic, Ratiocinative and Inductive*, **Book II, Chapter VI, §§1-3**

LOGICISM • Shapiro, *Thinking About Mathematics*, **ch. 5 §§1-2**

SEP 18 ✓04 • Frege, *The Foundations of Arithmetic*, **Introduction, §§1-28**

SEP 23 ✓05 • Frege, *The Foundations of Arithmetic*, **§§45-46,55-69**

SEP 25 ✓06 • Frege, *The Foundations of Arithmetic*, **§§68-83**
• Heck, "Frege's Theorem: An Introduction", **§§1-3**

SEP 30 ▶INT ***NO CLASS***

OCT 2 ✓07 • Frege, *The Foundations of Arithmetic*, **§§56,66-68** ▫ Russell & Frege, "Letters"
▶PS1 • Russell, *The Philosophy of Logical Atomism,* **pp. 100-105**
• Heck, "Frege's Theorem: An Introduction", **§4**

OCT 7 ✓08 • Russell, *Introduction to Mathematical Philosophy*, **ch. 1-3**

OCT 9 ✓09 • Russell, *Introduction to Mathematical Philosophy*, **ch. 7**

OCT 14 ***NO CLASS***

FORMALISM • Shapiro, *Thinking About Mathematics*, **ch. 6 §§1-4**

OCT 16 ✓10 • Hilbert, "On the Infinite"

OCT 21 ✓11 • Frege, *Grundgesetze der Arithmetik,* Volume II, **§§87-93**
• Boolos, "Gödel's Second Incompleteness Theorem Explained in Words of One Syllable", **p.1**

INTUITIONISM • Shapiro, *Thinking About Mathematics*, **ch. 7 §§1-3**

OCT 23 ✓12 • Brouwer, "Intuitionism and Formalism"

OCT 28 ✓13

REALISM • Shapiro, *Thinking About Mathematics*, **ch. 8 §§1,3**

OCT 30 ✓14 • Gödel, "Russell's Mathematical Logic", **pp. 447-449,454-459**
• Gödel, "What is Cantor's Continuum Hypothesis?", **§§1-2, pp. 483-485**

NOV 4 ✓15 • Benacerraf, "Mathematical Truth"
▶PS2 • Field, *Realism, Mathematics, and Modality*, **§4.B**

NOV 6 ✓16 • Maddy, "Perception and Mathematical Intuition", **§3**

NOV 11 ***NO CLASS***

NOV 13 ***NO CLASS***

NEO-LOGICISM • Shapiro, *Thinking About Mathematics*, **ch. 5 §4**

NOV 18 ✓17 • Wright, "On the Philosophical Significance of Frege's Theorem", **§§I-II**
• Heck, "Frege's Theorem: An Introduction", **§5-6**

NOV 20 ✓18

FICTIONALISM • Shapiro, *Thinking About Mathematics*, **ch. 8 §2 & ch. 9 §§1,3**

NOV 25 ✓19 • Field, *Realism, Mathematics, and Modality,* **§§1-3**

NOV 27 ✓20 • Field, *Science Without Numbers,* **ch. 2**

STRUCTURALISM • Shapiro, *Thinking About Mathematics*, **ch. 10 §§1-3**

DEC 2 ✓21 • Benacerraf, "What Numbers Could Not Be", **(skip the "digression" in 51-52)**
• Field, *Realism, Mathematics, and Modality*, **§4.A**

DEC 4 ✓22

DEC 9 ▶PS3