MATH 390-01: HISTORY OF MATHEMATICS (3 cr.)

SYLLABUS & COURSE POLICIES

DORDT UNIVERSITY

FALL 2025

Instructor:	Dr. Mike Janssen, Professor of Mathematics
Email:	`Mike.Janssen@dordt.edu`; I will endeavor to reply to every email within one school day.
Classroom:	SB 2732
Class time:	1:10–2:00 PM MWF
Office:	SB 1612
Office Phone:	(712) 722-6398
Student Hours:	By appointment/drop-in.
Course website:	`https://mkjanssen.org/courses/hom/hom_f25.html`. Contains this syllabus and downloadable slides.

Catalog course description: A survey of the history of mathematics from ancient times into the 20th century, in cultural context, with attention given to how the philosophy of mathematics relates to the development of mathematics. Prerequisite: grade of C– or higher in Mathematics 152; or permission of instructor.

RESOURCES

Required:

- *A History of Mathematics*, 3rd ed., by Victor J. Katz
- *What is Mathematics, Really?*, by Reuben Hersh
- *Mathematics Through the Eyes of Faith*, James Bradley and Russell Howell (eds.)
- Regular access to Canvas

Optional:

- *The Crest of the Peacock: Non-European Roots of Mathematics*, by George Gheverghese Joseph
- *Thinking about Mathematics*, by Stewart Shapiro

LEARNING OBJECTIVES

In this course, we will focus on becoming COMMUNICATORS of and AMBASSADORS for mathematics. In particular, we will:

grow in awareness of the human role in the development of mathematics. (CD)

describe key figures and events in the history of mathematics. (CD)

study major philosophies of mathematics. (RO)

articulate a personal philosophy of mathematics. (CD, CR)

complete a major research paper on a particular historical development in mathematics. (CD)

COURSE LITURGIES

We will use Katz as our primary guide through the history of math. On a few Fridays we will take some time to discuss the philosophy of mathematics in greater depth and make specific connections to the Reformed Christian faith. A more detailed (tentative) schedule can be found below.

HOMEWORK

Homework will consist of a mix of historical mathematics problems and short essay questions about recent material, and will be assigned every 2-3 weeks. Your responses should be typed (preferably in LaTeX) and submitted on Canvas. Tentative due dates are listed below; see Canvas for up-to-date information.

PHILOSOPHY JOURNALS

Throughout the semester, we will discuss a selection of readings about the philosophy of mathematics in class. Readings will consist of a mixture of chapters from Hersh, *MTEF*, and handouts posted to Canvas. Prior to each of those classes, a reading journal (3-4 pages) will be due. These should be used to develop your PERSONAL PHILOSOPHY OF MATHEMATICS. Tentative due dates are listed below; see Canvas for up-to-date information.

HISTORICAL TERM PAPER

One of the major works of the semester will be a research paper on a particular topic in the history of mathematics and/or statistics. Your topic should be selected by the end of September. A rubric will be available by mid-September. Tentative due dates for the components of the paper are listed below; see Canvas for up-to-date information.

PERSONAL PHILOSOPHY OF MATHEMATICS ASSIGNMENT

Through various readings and discussions we will consider different perspectives on some of the big questions of the philosophy of mathematics, including:

- What *is* mathematics? (Ontology)
- What is truth? How can we know mathematical truths? (Epistemology)
- What does it mean to *do* mathematics? Why should Christians (or anyone!) be concerned with mathematical questions? (Teleology)
- Why is mathematics *effective* in describing the physical Creation?
- What is beauty? What does it mean to say that mathematics is beautiful? (Aesthetics)
- What is chance, and how can we reconcile its seeming existence with God's sovereignty?

Through the readings and the journals, you will begin to articulate your own answers to these questions in the form of a PERSONAL PHILOSOPHY OF MATHEMATICS. At the end of the semester, you'll articulate and share this philosophy with the class in the form of an essay or other equivalent work (e.g., video, podcast, etc.).

NOTE ON THE USE OF GENERATIVE AI

Contrary to other math courses, this course includes a lot of writing (see above!). At NO POINT should you use generative AI tools for work related to this class (including, but not limited to, ChatGPT). The use of such tools for work in this class constitutes plagiarism and will be reported to the Student Life Committee.

GRADING POLICY

Course assignments will be weighted as shown in Table 1.

Activity	**Weight**
Homework	20%
Historical Term Paper	15%
Reading Journals	30%
Attendance and Participation	10%
Personal Philosophy of Math	25%

Table 1: Assignment weights.

Your final percentage, G, will be assigned a letter grade as shown in Table 2.

Grade	**Interval**
A	$95\% \leqslant G \leqslant 100\%$
A–	$90\% \leqslant G < 95\%$
B+	$87\% \leqslant G < 90\%$
B	$83\% \leqslant G < 87\%$
B–	$80\% \leqslant G < 83\%$
C+	$77\% \leqslant G < 80\%$
C	$73\% \leqslant G < 77\%$
C–	$70\% \leqslant G < 73\%$
D+	$67\% \leqslant G < 70\%$
D	$60\% \leqslant G < 67\%$

Table 2: Final grade cutoffs.

OTHER POLICIES AND ADVICE

I am generally fairly accepting of late work, with a built-in 24-hour grace period for any non-classroom activities. Additional time beyond the 24-hour grace period must be approved ahead of time.

Student hours are your time to ask questions about all aspects of the class and college life. Please check online for an appointment. If you can't find one, send me an email! I will do my very best to accommodate your you.

Email Policy: I check my email twice per school day: once in the morning, where I'll deal with any emergencies, and once in the afternoon, when I'll respond to other emails (including any that have come in since the morning). If you require a more immediate response, you're welcome to come find me in my office.

INSTITUTIONAL POLICIES

DORDT UNIVERSITY STUDENT'S RIGHT TO ACCOMODATIONS POLICY

Dordt University is committed to providing reasonable accommodations for students with documented qualifying disabilities in accordance with federal laws and university policy. Any student who needs access to accommodations based on the impact of a documented disability should contact the Coordinator for Service for Students with Disabilities, Academic Enrichment Center, 712-722-6490, Email: CSSD@dordt.edu.

DORDT UNIVERSITY ACADEMIC INTEGRITY POLICY

Dordt University is committed to developing a community of Christian scholars where all members accept the responsibility of practicing personal and academic integrity in obedience to biblical teaching. For students, this means not lying, cheating, or stealing others' work to gain academic advantage; it also means opposing academic dishonesty.

Students found to be academically dishonest will receive academic sanctions from their professor (from a failing grade on the particular academic task to a failing grade in the course) and will be reported to the Student Life Committee for possible institutional sanctions (from a warning to dismissal from the university). Appeals in such matters will be handled by the student disciplinary process. For more information, see the Student Handbook section concerning Academic Integrity.

DORDT UNIVERSITY ATTENDANCE POLICY

Class attendance policies and procedures as outlined in the Student Handbook are in place. To paraphrase the Student Handbook, Dordt University as an institution remains committed to in person instruction for face-to-face courses. As a result, you are expected to be present for every class period and laboratory period. Should you need to miss class for any reason, contact your instructor as soon as possible (either prior to the absence or immediately following). If the absence is the result of a documented disability, academic accommodations will be handled by the Coordinator for Service for Students with Disabilities. Absences for Dordt-sponsored curricular or co-curricular activities will be communicated by the activity sponsor and are considered excused. You are responsible to contact your instructor to make arrangements for missed work. Your instructor is not required to provide real time (synchronous) learning for you should you be absent for class for any reason (e.g., Zooming into your real time class). Your instructor is also not required to provide asynchronous virtual learning materials for you (e.g., recordings of missed classes, slide decks, other materials on Canvas). While some instructors might utilize some of the synchronous/asynchronous methods of making up work on occasion, you should not expect all instructors to provide these experiences automatically. Methods of making up missed work might include: contacting a fellow student to get notes from class, extensions on assignments or labs, or other methods as determined by your instructor. Making arrangements for missed class work is your responsibility! Please see your instructor's specific attendance policy.

I reserve the right to make changes to this document as the need arises.

Tentative Schedule

Date		Lecture #	Daily Plan	Readings	Other Work Due
Aug 27	W	1	HoM in a Large Nutshell		
Aug 29	F	2	Egyptian Math	Katz 1–10	
Sep 1	M	3	Mesopotamian Math	Katz 10–26	
Sep 3	W	3	Mesopotamian Math	Katz 10–26	Homework 1
Sep 5	F	4	Pre–Euclidean Math	Katz 33–47	
Sep 8	M	5	Greek Philosophy of Math I	Katz 36–41	
Sep 10	W	5	Greek Philosophy of Math II	Hersh, 91–106	
Sep 12	F		Philosophy I	MTEF, 1–36; Hersh, Dialogue with Laura and pp. 3–34	Phil. Journal 1
Sep 15	M	6	Euclid	Katz 51–65	
Sep 17	W	6	Euclid	Katz 51–65	Homework 2
Sep 19	F	7	Archimedes and Apollonius; Late Greek Math	Katz 94–127, 172–190	
Sep 22	M	8	Chinese Arithmetic and Linear Algebra	Katz 196–226	
Sep 24	W	9	Indian Arithmetic and Algebra	Katz 231–260	
Sep 26	F	10	Arabic Arithmetic and Algebra	Katz 267–292	
Sep 29	M	11	Astronomy and Navigation	Katz 133–157, 432–452	
Oct 1	W		Philosophy II	Hersh 35–90; MTEF Ch. 3–5	Phil. Journal 2, Homework 3
Oct 3	F		No Class: Heartland Break		
Oct 6	M	12	Math around the world	Katz 364–379	
Oct 8	W	13	Medieval Arithmetic and Algebra: Fibonacci	Katz 292–318	
Oct 10	F	14	Medieval and Renaissance Algebra	Katz 342–351, 383–404	Term Paper Annotated Bib.
Oct 13	M	15	Bombelli and Viete	Katz 404–417	
Oct 15	W	16	Renaissance Math	Katz 423–461	Homework 4
Oct 17	F	17	Descartes and Fermat	Katz 468–487	
Oct 20	M	18	Calculus: Beginnings	Katz 508–538	
Oct 22	W	19	Calculus: Newton	Katz 544–565	
Oct 24	F	20	Calculus: Leibniz	Katz 565–578	
Oct 27	M	21	Foundations of Calculus	Katz 583–584, 594 (Euler bio), 611–636	
Oct 29	W		Philosophy III		Phil. Journal 3, Homework 5
Oct 31	F	22	Probability	Katz 643–661	
Nov 3	M	23	18th Cent. Alg. And Num. Th.	Katz 665–682	
Nov 5	W	24	18th Cent. Geom.	Katz 687–705	
Nov 7	F	25	Modern Algebra	Katz 724–768, 890–903	Historical Term Paper
Nov 10	M	26	19th Cent. Analysis	Katz 764–812	
Nov 12	W	27	19th Cent. Geom.	Katz 834–869	Homework 6
Nov 14	F	28	Axioms and Set Theory	Katz 867–870, 876–882	
Nov 17	M	29	Foundational Crises	Hersh 137–164	
Nov 19	W	29	Foundational Crises	Hersh 137–164	Personal PoM First Draft
Nov 21	F		Philosophy IV	Hersh 165–181; MTEF Chs. 9–11	Phil. Journal 4
Nov 24	M	30	Statistics and Computation	Katz 903–919	
Nov 26	W		No Class: Thanksgiving break		
Nov 28	F		No Class: Thanksgiving break		
Dec 1	M		No Class: Thanksgiving break		
Dec 3	W	31	Recent Developments	Katz 919–925	Homework 7
Dec 5	F	31	Recent Developments	Katz 919–925	
Dec 8	M	32	Women in Math		
Dec 10	W	32/33	Women in Math/Neo-Kuyperian Approach to Math	Jongsma and Vander Meulen	
Dec 12	F	33/34	Neo-Kuyperian Approach/Math at Dordt		
Dec 16	T		Final Discussion: 1:10-2:50pm		