MATH 149-01: EXPLORATIONS IN MODERN MATHEMATICS (3 cr.)

SYLLABUS & COURSE POLICIES

DORDT UNIVERSITY

SPRING 2025

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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 1637
Class time:	2:10–3:00 PM MWF
Office:	SB 1612
Office Phone:	(712) 722-6398
Student Hours:	By appointment. See Canvas for details.
Required Resources:	*Mathematics for Human Flourishing* by F.E. Su
	Access to a Rubik's cube
	Access to our online text, *Explorations in Modern Mathematics*
Required for:	Core QR, middle school math endorsement
Prerequisite:	an ACT mathematics score of 22 or higher or satisfactory completion of one course from Mathematics 100, 108, 115.

Catalog course description: This course is focused on exploring college-level mathematics relevant for all students, regardless of discipline. We will investigate modern mathematical topics including number theory, modeling, fractals, infinity, probability, making meaning from data, and decision-making. Mathematical thinking, reasoning, and pattern discovery will be particularly emphasized. A guided discovery approach will be utilized, and we will discuss how a Reformed perspective impacts our view of the quantitative world.

COURSE OVERVIEW

LEARNING OBJECTIVES

In this course, students will:

be *communicators* by working together in groups on mathematical puzzles and sharing their thinking with the class. (CD)

be *explorers* by playing with God's mathematical creation, explicitly with the Rubik's cube, and implicitly with other puzzles and questions. (CS)

be *connectors* by exploring the power and limitations of mathematics for modeling the physical creation, and applying mathematical thinking to articulate a vision for a more just society. Students will also explore the notion of mathematical truth, and assess its place in understanding God's creation. (RO, CS, CR)

be *ambassadors* by identifying, analyzing, and presenting on an aspect of beauty in mathematics. (RO, CS)

COURSE LITURGIES

In this section, we briefly describe the basic rhythms of the course. Mathematics is not a spectator sport, and this course is designed with this axiom in mind.

CLASS EXPLORATIONS

The heart of this course is the in-class work. Our class meetings will typically start with a short (5–10 minutes) introduction to the main questions under consideration. You'll then work informally in groups of approximately 3 to explore mathematical questions and activities. We'll wrap up with discussions of whatever you found the most interesting, as well as some big-picture takeaways.

This mode of instruction is **highly interactive; it is therefore essential that you participate in class each day**. Group participation will be monitored, and groups will regularly and informally share their thinking with the class. The in-class work will also prepare you for the weekly work, described below.

WEEKLY WORK

On most Wednesdays, a **Weekly Work** assignment will be due on Canvas. Specifics will vary from week to week, but they will typically include (but are not limited to) some of: exercises from the textbook; a short essay/reflection question; a class activity to which you'll write up clean, clear solutions. These will be submitted in PDF form, which may include smartphone scans of written work (though unreadable work may result in you work being assessed a penalty). Each Weekly Work assignment wil be worth 20 points.

CHECKPOINTS

During the semester, we'll have four **Checkpoints**, each of which will assess your proficiency with the mathematical content covered since the last checkpoint. They will be worth 40 points each, and given on the following dates:

Checkpoint 1: February 7   Checkpoint 3: March 26

Checkpoint 2: February 26   Checkpoint 4: April 23

READING REFLECTIONS

Along the way, we'll read from Francis Su's *Mathematics for Human Flourishing* and consider how mathematics can be a part of a life of flourishing in the kingdom of God. Reading reflection assignments will be due on the following dates.

Reading Reflection 1: January 24   Reading Reflection 4: March 28

Reading Reflection 2: February 7   Reading Reflection 5: April 11

Reading Reflection 3: February 21   Reading Reflection 6: April 25

FINAL PROJECT

Your final project will consider the aesthetic qualities of mathematics. You'll explore a particularly beautiful mathematical idea or application and present during the final exam slot, which is scheduled for 3:30pm on Tuesday, May 6. Details will be available on Canvas by spring break.

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.

Policy on Generative AI: Unless specifically permitted by Dr. Janssen in advance of student submission of work, any use of AI will be considered a breach of academic integrity. Suspected cases of misuse of AI tools will be treated as plagiarism and submitted to the Student Life Committee.

GRADING POLICY

Your final grade percentage G will be calculated using the weighted categories below.

Category	Weight
Weekly Work	20%
Checkpoints	40%
Reflections	20%
Final Project	20%

Your final grade will be assigned based on the range in which G falls:

Grade	Range	Grade	Range
A	$92\% \leqslant G \leqslant 100\%$	C	$73\% \leqslant G < 77\%$
A–	$90\% \leqslant G < 92\%$	C–	$70\% \leqslant G < 73\%$
B+	$87\% \leqslant G < 90\%$	D+	$67\% \leqslant G < 70\%$
B	$83\% \leqslant G < 87\%$	D	$63\% \leqslant G < 67\%$
B–	$80\% \leqslant G < 83\%$	D–	$60\% \leqslant G < 63\%$
C+	$77\% \leqslant G < 80\%$		

TENTATIVE SCHEDULE

Play: January 13–February 5   Power: March 12–April 4

Truth: February 5–28   Justice: April 7–May 2

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.**