

HONORS DISCOVERY SEMINAR: WHAT IS RESEARCH IN THEORETICAL MATHEMATICS?

INSTRUCTOR: Kristin DeVleming (she/her)
[https://people.math.umass.edu/~devleming/
kdevleming@umass.edu](https://people.math.umass.edu/~devleming/kdevleming@umass.edu)

COURSE MEETING: 1:25 - 2:15 PM Wednesday, Elm 224

OFFICE HOURS: TBA, or by appointment

Overview

The goal of this course is to introduce students to:

1. Foundations of mathematical logic
2. Different areas of research in mathematics
3. Open problems
4. Methods for ‘doing’ mathematics

Regardless of your mathematical background, I hope to introduce all of you to at least one area of mathematics that you have never seen before. We also will see many problems that are currently unanswered, so you’ll get comfortable with not knowing the answer right away (if at all!).

Class Structure

Typically, class will be a mix of small lectures, hands-on problem solving, reading mathematical articles, and presenting solutions to problems and summaries of articles. I will post a schedule of topics and an article or paper to read for the associated topic each week.

Grading and Assignments

While the course does not have traditional homework assignments to be handed in, your grade will be based on: attendance and participation in class, presenting solutions to problems on the board and summaries of articles, and your 7 minute presentation and corresponding write-up at the end of the semester.

You may miss up to two classes for full credit on attendance. If you have extenuating circumstances causing you to miss more than two classes, please reach out to me so we can make a plan for you to succeed.

Participation will be based on the following factors: working and contributing to your group during worksheet sessions, asking questions, and staying engaged during class.

All students must present at least two problem solutions or topic summaries to the class during the semester for full credit. The solutions do not necessarily have to be fully correct, although you should clearly be able to explain your results.

The rest of the grade will be based on a ~7 minute presentation toward the end of the semester. I will provide more information as it gets closer, but you will give a short presentation on either an area of math, an open problem, a breakthrough result, or a mathematician, and write a corresponding survey paper.

Accommodation Policy Statement

UMass is committed to providing an equal educational opportunity for all students. A student with a documented physical, psychological, or learning disability on file with Disability Services may be eligible for academic accommodations to help them succeed in this course. If you have a documented disability that requires an accommodation, please notify your instructor during the first two weeks of the semester so that we can make appropriate arrangements. Information on services and materials for registering with Disability Services are also available on the Disability Services website, <https://www.umass.edu/disability/>.

UMass Official Academic Honesty Statement

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent (http://www.umass.edu/dean_students/codeofconduct/acadhonesty/).

Other Resources

If you are struggling in any way throughout the semester, my door is open to talk. The University also provides low- or no-cost mental health and counseling services to all students through the Center for Counseling and Psychological Help, <https://www.umass.edu/counseling/>.

I endorse Federico Ardila's axioms:

1. Mathematical talent is distributed equally among different groups, irrespective of geographic, demographic, and economic boundaries.
2. Everyone can have joyful, meaningful, and empowering mathematical experiences.
3. Mathematics is a powerful, malleable tool that can be shaped and used differently by various communities to serve their needs.
4. Every student deserves to be treated with dignity and respect.