

VIRGINIA COMMONWEALTH UNIVERSITY  
Department of Mathematics

I. Required Syllabus Information

**A. Course prefix and number, section number, and title**

Associated Term: Fall 2023                      CRN:24205  
Campus: Monroe Park                              Schedule Type: Lecture  
Section Number: 902                                Subject: Mathematics & Applied Mathematics  
Course Number: 490                                 Credit Hours: 3  
Title: MATH EXPOSITIONS

**C. Class meeting days/times/location**

Class meeting days/times: MW 4:00 PM – 5:15 PM  
Location: Monroe Park Campus | Harris Hall South | Room 3003  
*In-person classes will only sometimes be held at this time. Please consult the schedule for detailed information.*

**D. Instructor name, contact information, and office hours**

Instructor name: Allison H. Moore ([moorea14@vcu.edu](mailto:moorea14@vcu.edu))  
Office location: Harris Hall 4149  
Student hours: The unique nature of this class is that it is largely self-paced. With the exception of “live lectures” (consult schedule), students may view our class meeting time as “Student Hours.” Please feel free to meet with me then over Zoom to discuss your individual progress and receive feedback on your writing. I will be also be available in person Monday 1-2 PM and Friday 9-10 AM in HH 4145. For a Zoom or in-person meeting at any other time, be sure to email me at least 24 in advance to request a meeting.

**E. University course description (required to be verbatim from the University Bulletin)**

Enrollment is restricted to seniors in mathematical sciences with a minimum of 85 credit hours taken toward the degree. Required for all majors in the Department of Mathematics and Applied Mathematics. A senior capstone course in the major designed to help students attain proficiency in expository mathematical writing and oral presentation, which require the efficient and effective use of mathematics and the English language. Students will learn a variety of topics in mathematics, write reviews of selected award-winning mathematics papers and write a senior paper.

**F. Course prerequisites, if any**

UNIV 200 or HONR 200 with a minimum grade of C.

**G. Student learning outcomes**

MATH 490 is a writing-intensive capstone mathematics course. The intended learning outcomes include developing communication and reading comprehension skills specific to a mathematics context, experience with oral mathematical presentations, and proficiency in expository mathematical writing. Students will develop critical analysis skills by analyzing mathematical articles and presentations, including writing critiques of AI-generated text. This course will

provide an opportunity for students to organize and synthesize the mathematical knowledge they have gained from their mathematics education. A major goal of the course is to help students create a comprehensive presentation that demonstrate both the significance of the mathematical material and an understanding of the mathematical ideas contained in the work. This course is explicitly focused on writing and presenting *mathematics*. General writing and research skills will be assumed as background knowledge from prerequisite coursework.

## H. Required texts and/or course materials

1. There are no required textbooks.
2. Various course materials (math articles and reading assignments) will be distributed via Canvas throughout the semester.
3. Students will be required to use LaTeX (see overleaf.com) for most writing assignments and presentations. Information and guidance will be given on using LaTeX.
4. Students will be required to present material either in person, via Zoom, or to provide a pre-recorded video presentation. For students opting to use Zoom or pre-recorded video, use of a computer capable of audio and video recording will be required.

## I. Course schedule

The class is organized into four modules. The schedule of assignments provided here should be viewed as a tentative outline. A detailed Course Calendar containing the dates of live lectures, all assignments, and graded discussions will be maintained as a separate document. Relevant deadlines and reminders will be provided through Canvas. It is the student's responsibility to keep up with the assignment deadlines for the course. In the first three modules, there is approximately one assignment per week (worksheet, review, presentation, or paper). The fourth module is dedicated to your capstone project: term paper and final presentation.

Assignment Schedule: *This is intended as a tentative outline only. Students should plan to follow the detailed Course Calendar for exact dates and deadlines*

- |                                     |                         |
|-------------------------------------|-------------------------|
| • Graded discussion                 | August 28-30            |
| • LaTeX Worksheet                   | September 6             |
| • Student Solution Worksheet        | September 13            |
| • Paper 1: Math fact                | September 20            |
| • Graded discussion                 | September 25-27         |
| • Review of department seminar 1    | September 27            |
| • Review of department seminar 2    | October 4               |
| • Presentation of math fact         | October 11              |
| • Graded discussion                 | October 16-18           |
| • AI-Generated Text Analysis        | October 25              |
| • Math Article Paper                | November 1              |
| • Presentation of Math Article      | November 8              |
| • Term paper proposal               | November 15             |
| • Presentation abstract and outline | November 29             |
| • Term paper draft                  | December 6              |
| • Term paper due                    | December 13 at 11:59 PM |

### **J. Final exam date and time (if applicable)**

A final presentation and term paper on a topic of your choosing, subject to approval by the instructor, is a major component of the course. The final term paper and presentation are due by 11:59 PM on December 13, via Canvas. **Any student who fails to submit a term paper or final presentation will receive an 'F' and fail the class.**

### **K. Grading scale**

Points on a 1,000 point scale from the modules above are added at the end of the semester and a letter grade is assigned as follows:

900-1000 A, 800-899 B, 700-799 C, 600-699 D, below 600 F.

Instructor reserves the right to curve.

### **L. Grade categories and weights**

Modules (TOTAL POINTS = 1000)

#### **Module 1 (200 points, 4 weeks) - *LaTeX, Overleaf and an introduction to mathematical writing***

- (25 points) Graded discussion forum: How to write mathematics
- (50 points) Worksheet: Basic LaTeX, Overleaf, typesetting mathematical notation, inline vs. centered equations, tables and figures
- (50 points) Worksheet: Improving and typesetting a student's solution
- (75 points) Paper (3 pages) on a mathematical fact that every math major should know

#### **Module 2 (150 points, 3 weeks) - *Speaking about basic mathematical topics***

- (25 points) Graded discussion forum: How to speak about math
- (25 points) Review (1-2 pages) of a department seminar
- Presentation slides on your math fact topic (at least 8 slides) created with LaTeX/Beamer
- (75 points) Presentation (8-10 minutes) on mathematical fact
- (25 points) Review (1-2 pages) of a department seminar

#### **Module 3 (250 points, 4 weeks) - *Writing and speaking about intermediate/advanced mathematical topics***

- (25 points) Graded discussion forum: writing math papers
- (75 points) AI-Generated text analysis
- (75 points) Paper (3-5 pages) on a math article
- Presentation slides on one math article (at least 8 slides) created with LaTeX and Beamer
- (75 points) Presentation (8-10 minutes) on math article

#### **Module 4 (400 points, 4 weeks) - *Term paper and final presentation on a topic of your choice (subject to approval by instructor)***

- (25 points) Term paper proposal
- (25 points) Presentation outline and abstract
- (75 points) Draft term paper (at least 12 pages)
- (200 points) Final term paper (at least 15 pages)
- Presentation slides (at least 15 slides)
- (75 points) Final presentation

## Assignment Descriptions

1. Graded discussion forums: In each of the first 3 modules you will participate in discussion forums on “how to write math” and “how to speak about math” and “how to write math papers.” In particular, students are required to make posts about assigned readings and may share links to additional online sources you found on these topics. This will be conducted within Canvas discussion boards.
2. LaTeX Worksheets: There will be two homework assignments designed to introduce you to LaTeX. The first involves typesetting mathematical formulae becoming familiar with how LaTeX handles formatting; the second assignment asks you to improve a student’s homework solution.
3. Presentations: You will give three presentations throughout the semester: an 8 minute presentation on a mathematical fact, an 8 minute presentation on a prize winning mathematical article and a 15-20 minute presentation on your final term paper.
4. Reviews: You will write a two short reviews of department seminars. Each review will be 2 pages. Any real-time, in-person or real-time Zoom seminar or colloquium in math, applied math, or physics at VCU is suitable. Check with me first if you want review an outside seminar.
5. Papers: Assignments designated as “papers” are expository writing assignments that are lengthier and more detailed than reviews (3-5 pages). There will be two such papers: one on a mathematical fact that every math major should know, and a second covering an article selected from a list of prize-winning mathematical articles.
6. AI-Generated Text Analysis: You will be provided with mathematical exposition written by an AI program. You will check each line of text, determine its mathematical correctness and analyze the exposition. You will correct mistakes, add references and context, and rewrite the exposition in your own voice.
7. Term Paper: The semester will culminate in a term paper (about 15 pages) on a mathematical topic of your choice. The instructor must approve your topic choice and proposal. In advance of the term paper deadline, you will submit a proposal and a draft for your paper and a draft.
8. Final Presentation: In module 4, you will give a 15-20 minute presentation on a mathematical topic of your choice (subject to my approved). This is typically the same topic as the term paper, but you are also permitted to choose another topic. In advance of your presentation, you will submit an outline and an abstract for approval.

### **M. Link to the VCU Syllabus Policy Statements on the Provost’s Website**

Students should visit <http://go.vcu.edu/syllabus> and review all syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.

### **N. The following statement and link:**

Use VCU Libraries to find and access library resources, spaces, technology and services that support and enhance all learning opportunities at the university. (<https://www.library.vcu.edu/>)

## II. Additional Syllabus Information

### O. Time and Effort Expectations

This is a course in which students have greater flexibility and control over the course content: the reviews, papers, and term projects involve your choice in mathematical topic and content. With this greater freedom comes increased responsibility, particularly with time management and personal effort. Students are expected to spend quite a bit of time (4 to 8 hours per week), working on this class, though each student is unique and this estimate will necessarily vary. In order to do well, it is critical that you set aside blocks of time during your schedule to work on Math 490 assignments every week and pay close attention to deadlines.

### P. Hybrid Synchronous Modality

VCU defines the hybrid synchronous modality as follows: A minimum of 30% of the course time is completed by the instructor and student physically sharing the same physical space/location at the same time. The remainder of the course time is completed in an online/remote environment (i.e., learning management system). Required to take place on a specific day and time.

This course is unusual in that some parts are conducted synchronously, and in-person. Other parts are conducted synchronously online, and some parts (for example, the parts when you are working on longer writing assignments) are conducted asynchronously. Students should plan to regularly consult Canvas and the Course Calendar to stay on top of assignments and deadlines.

### Q. Zoom and Canvas

For virtual meetings, we will use the following Zoom link:

<https://vcu.zoom.us/j/81192142000>

Meeting ID: 811 9214 2000

You will use Canvas to download and submit all assignments, and to participate in graded discussion boards. You will also be required to use LaTeX. This can be done with any web browser by creating a free Overleaf account.

### R. Policies specific to MATH 490

1. If you do not participate in the first two weeks of class, there is a risk that you may be dropped from the class.
2. Plagiarism and accusations of academic dishonesty or misconduct will be taken seriously. Please review the section on academic misconduct in the VCU Honor System.
3. Criticism of AI-generated text will be part of the coursework in this class. On some of the writing assignments, assistive use of AI will be permitted, within the instructions and guidelines specific to those assignments. However, *unless explicitly permitted*, the use of AI-generated text is not allowed in your writing for Math 490, and will be considered as both cheating and plagiarism.
4. Any student who fails to submit a term paper or deliver a final presentation will fail the course *regardless of the point totals accumulated on other assignments*.
5. All papers, drafts, outlines and abstracts must be submitted via Canvas in PDF format

by midnight on the due dates.

### **S. Our shared learning environment**

I am dedicated to providing a welcoming and inclusive environment for all students, independent of your immigration status, country of origin and/or citizenship, race, ethnicity, religious affiliation, gender/sex, gender identity, sexual orientation, age, ability or disability, socioeconomic status, or perspective. Thank you for joining my class and bringing your unique experience and background to our intellectual community.

### **T. Students with disabilities:**

VCU is committed to ensuring that all students maintain equal access to all aspects of the university, including educational experiences through the provision of reasonable accommodations and academic adjustments. In addition to being a requirement under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, this speaks directly to VCU's mission of inclusion, equity, and access. To receive accommodations or other disability-related supports, students must register with the Office of Student Accessibility and Educational Opportunity on the Monroe Park Campus (828-2253) or the Division for Academic Success on the MCV campus (828-9782). Students and faculty can visit the [Student Accessibility and Educational Opportunity website](#) and/or the [Division for Academic Success website](#) for additional information. Once students have completed the registration process, they will be provided with a letter of accommodation. They should provide a copy to their instructor(s) and attempt to schedule a meeting to discuss the implementation of accommodations as early in the semester as possible.