Math 490: Mathematical Expositions

Spring 2021, Section 001
TR - 2:00 - 3:15 pm
LOCATION:
https://vcu.zoom.us/j/92921159103
First class: Tuesday, January 26 at the above Zoom link

Instructor: Brent Cody
Personal Website: http://www.people.vcu.edu/~bmcody/
Office: Harris Hall Room 4110
Email: bmcody@vcu.edu
Prerequisite: UNIV 200 or HONR 200. Restricted to seniors majoring in mathematical sciences with at least 85 credit hours taken toward the degree. Required for all majors in the Department of Mathematics and Applied Mathematics.
Class Meeting: Class will *sometimes* be held once or twice a week.
Office Hours: T 3:30 - 4:30 pm & R 10:00 - 11:00 am held in our Zoom room:
https://vcu.zoom.us/j/3488900042
You must notify me by 9:00 pm the day before if you'd like to meet during office hours.

Course website

https://canvas.vcu.edu/

Summary of Online Aspects of the Course

- I encourage you to attend all of the live lectures I will be giving for this course, however, lectures will be recorded and posted so that you can view them at a later time.
- There will be several discussion forum assignments that will require you to make multiple posts on a given day and read your fellow student's posts.
- You will give a total of three presentations. You will have the option of either giving your presentation during our class time (on Zoom) so that I can record it, or you can submit your own video recording. I strongly encourage you to give your presentation during class.
- You will be required to use LaTeX (see overleaf.com) for all writing assignments and presentations. Information and guidance will be given on using LaTeX.
- All assignments will be submitted on Canvas.

Description

MATH 490 is a capstone course. It is intended to emphasize communication skills, including reading, writing and speaking mathematics. It will give you an opportunity to consolidate and demonstrate the meaning and significance of the mathematical knowledge you have achieved. A major goal of the course is to help students access, understand and share mathematical ideas independently, outside of the classroom environment.

What to expect

This course should be fun! To a certain extent you will be able to choose what topics you work on. I expect that you will spend about 7 to 8 hours per week working on this class. In order to do well, it is important that you set aside blocks of time during your schedule to work on Math 490 assignments every week.

Modules (TOTAL POINTS = 1000)

Module 1 (**165 points**, 2 weeks) - *LaTeX, Overleaf and an introduction to mathematical writing*

- (**20 points**) Graded discussion forum: How to write mathematics
- (**30 points**) Worksheet: Basic LaTeX, Overleaf, typesetting mathematical notation, inline vs. centered equations, turning a "solution" into mathematical writing
- (**20 points**) Review (1-2 pages) of a former student's paper
- (**20 points**) Review (1-2 pages) one guest lecture video
- (**75 points**) Paper (3 pages) on a mathematical fact that every math major should know

Module 2 (**155 points**, 3 weeks) - *Speaking about basic mathematical topics*

- (**20 points**) Graded discussion forum: How to give a math presentation
- (**20 points**) Review (1-2 pages) of a former student's presentation
- (**20 points**) Review (1-2 pages) one guest lecture video
- Presentation slides on your math fact topic (at least 8 slides) created with LaTeX and Beamer
- (**75 points**) Presentation (8-10 minutes) on mathematical fact
- (**20 points**) Review (1-2 pages) one student presentation

Module 3 (**265 points**, 4 weeks) - *Writing and speaking about intermediate/advanced mathematical topics*

- (**20 points**) Graded discussion forum: writing math papers
- (**75 points**) Paper (3-5 pages) on a math article #1
- (**20 points**) Graded discussion forum: writing math papers
- (**75 points**) Paper (3-5 pages) on a math article #2
- Presentation slides on one math article (at least 8 slides) created with LaTeX and Beamer
- (**75 points**) Presentation (8-10 minutes) on math article
- (**20 points**) Review (1-2 pages) another student's presentation video

Module 4 (**415 points**, 6 weeks) - *Term paper and final presentation on a topic of your choice (approved by me)*

- (**40 points**) Term paper proposal
- (**75 points**) Draft term paper (at least 12 pages)
- (**140 points**) Final term paper (at least 15 pages)
- Presentation slides (at least 15 slides)
- (**140 points**) Final presentation

Points 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
500 - 599	F

1. **Graded discussion forums**: Throughout the semester you will participate in several graded discussion forums on "writing about math" and "how to give math presentations." You will be required to make posts about various readings. You will also share links to additional online sources you found on these topics.

2. **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 20 minute presentation on your final term paper.

3. **Reviews**: You will write a total of six "reviews" of various presentations and mathematical articles. Each review will be 2 pages.

4. **Papers**: You will write three midterm papers: one on a mathematical fact that every math major should know and two on articles selected from a list of prize-winning mathematical articles.

5. **Term Paper**: At the end of the semester, you will submit a term paper (about 15 pages) on a mathematical topic of your choice and one I approve. In advance of this, you will submit a proposal for your paper and a draft.

6. **Final Presentation**: During the second half of the semester, you will give a 20-minute presentation on a mathematical topic of your choice (approved by me). Usually students speak on their term paper's topic, but you are also permitted to choose another topic. In advance of your presentation, you will submit an outline and an abstract for me to approve.

Course Policies

- If you do not participate in the the first two weeks of class, you may be dropped from the class.
- Be careful of plagiarism. If you're unsure about what is appropriate and what is not, please ask. For details read the VCU Honor System.
- Regardless of the final point total, a student who fails to submit a term paper or deliver a final presentation will fail the course.
- All papers, drafts, outlines and abstracts are due to the Blackboard site in

  PDF format

  by midnight on the appointed days.

Important Dates

Monday, February 8	Last day to drop a course
Wednesday, May 5	Last day of class and last day to **withdraw** with a mark of "W".

For other important dates visit: https://academiccalendars.vcu.edu/.

Inclusive statement

I want you to know that I am grateful for your presence and input in our classrooms (whether in person or online). I appreciate and welcome you regardless of your immigration status, country of origin and/or citizenship, race, ethnicity, religious affiliation, gender/sex, gender identity, sexual orientation, age, or dis/ability. Thank you for enriching our world, sharing your vital experience, and contributing to the diversity that makes our intellectual community vibrant and evermore creative.

University Wide Policies

Tips for Success

- When taking online and hybrid courses, your self-motivation and self-pacing are absolutely critical. For this course, you should plan to work about 7-9 hours per week as we move through the materials. Be sure to plan your time accordingly.
- Make yourself a calendar with all of your due dates across ALL of your courses. Plan for when you will work on each one for completion in advance of the due dates.
- Make sure you note any "online" course that still have a required meeting time (such as a Google Meet or Zoom session).
- Avoid the common assumption that online courses are easier or should be easier. That is a MYTH!!
- Plan Ahead!! Study as you go instead of at the last minute!

Students with disabilities

Students with disabilities Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, as amended, require that VCU provide "academic adjustments" or "reasonable accommodations" to any student who has a physical or mental impairment that substantially limits a major life activity. To receive accommodations, 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). Please also visit the Student Accessibility and Educational Opportunity website via https://saeo.vcu.edu/ and/or the Division for Academic Success website via https://das.vcu.edu/ for additional information.

Once students have completed the registration process, they should schedule a meeting with their instructor (s) and provide their instructor (s) with an official accommodation letter. Students should follow this procedure for all courses in the academic semester.

More University Policies

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.