Math 490: Mathematical Expositions

Fall 2020, Section 002
MW - 9:30 - 10:45 pm
LOCATION:
https://vcu.zoom.us/j/92433950257

Instructor: Brent Cody
Website: http://www.people.vcu.edu/~bmcody/
Office: Harris Hall Room 4110
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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 *usually* be held once or twice a week.
Office Hours: M 2:00 - 2:50 pm & W 4:00 - 4:50 pm held in our Zoom room:
https://vcu.zoom.us/j/92433950257

Course website

You will submit all assignments on Canvas:

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 team-based assignments for which you will be expected to collaborate with a team member on our course discussion forums.
- 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, but if you choose to submit a video, I will require that you submit a test video (one week before the relevant due date) to be sure that the audio and video quality will be sufficient.
- You will be expected 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. Near the beginning of the course we will discuss making presentations and writing about mathematics. In collaboration with another student you will make an 8 minute presentation about a mathematical idea that all mathematics majors should understand. In addition, we will host presentations from a number of mathematicians. You will submit reports on these presentations and reviews of mathematical articles. During the second half of the semester you will undertake an independent study of a mathematical topic, sharing what you learned in a term paper and in an oral presentation.

A major goal of the course is to help students access, understand and share mathematical ideas independently, outside of the classroom environment.

You will be graded on eight main areas:

Assignment	**Due Date**	**Points**
(∗) How to Give a Math Talk Discussion	August 26	20
(∗) Team Presentation on Mathematical Facts	September 2	100
(∗) Writing about Math Discussion	September 9	20
(∗) Review of Mathematics Article #1	September 16	50
(∗) Review of Mathematics Article #2	September 30	50
Presentation Report #1 (on team presentation)	September 9	30
Presentation Report #2 (on team presentation)	October 21	30
Presentation Report #3 (on outside seminar)	Within one week after event	30
Presentation Report #4 (on in-class or outside seminar)	Within one week after event	30
(∗) Team Presentation on a Mathematical Article	October 12 & 14	100
Term Paper Proposal #1	October 19	20
Term Paper Proposal #2	October 26	20
First Draft of Term Paper	November 6	70
Final Presentation	November 18 & 23	200
Term Paper	December 2	200
Attendance/Engagement	N.A.	30
Total		1000

(1) **Discussions**: You will participate in forum discussions on "how to give a math talk" and on "writing about math." Readings and videos will be assigned and discussed. You will also share links to additional online sources you found on these topics.
(2) **Team Presentation on Mathematical Facts**: You and a classmate will prepare an 8 minute presentation on one of the "Mathematical facts that every math major should be able to share on a moment's notice." Team presentations will typically be given during class, recorded using Zoom and then posted online for students in our class to view. Instead of giving a presentation during class, your team may request to submit a pre-recorded presentation.
(3) **Presentation Reports**: You are required to write a short (1 or 2 page) report on at least four presentations that you attend over the course of the semester. You may attend any seminar in the mathematics, physics or chemistry departments, or in the School of Engineering, provided that the talk has some mathematical content. The first two reports will be on team presentations given by your classmates. In addition, you will write one report on a talk given by a guest speaker in this class, and one report on a talk outside of the class. They are due not later than a week after your attendance.
(4) **Reviews of Mathematical Articles**: You will choose two articles from a list of prize-winning mathematical articles and write a critical review of each one. There will be guidelines on how to find an article and how to write a review.
(5) **Team Presentation on a Mathematical Article**: You and a classmate will make a 10-minute presentation on one of these articles.
(6) **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.
(7) **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.

(8) **Attendance/engagement**: You are expected to attend and be engaged in each class. You can earn a total of 30 points for Attendance/engagement. Each unexcused absence results in 5 points deducted from this score.

Your grade is based on points earned on assignments as follows. Assignments with a $(*)$ in front of them will have a graded discussion forum portion, indicating that I will review the associated discussion forums on Canvas and assign points according to your quantity and quality of participation.

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

Important Notes

- Come to class (or watch videos), participate in discussions, pay attention, stay engaged and try to stay on top of things. In addition, don't hesitate to ask questions. In other words, do not shy away from seeking clarification as soon as possible.
- 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.
- Stop by my Zoom office hours, send me email, or post in the discussion forums as often as you wish and need to; don't shy away.
- Last but not least, have a positive attitude towards the course. Set high standards for yourself and I will do my best to help you achieve them.

Important Dates

Tuesday, November 24 — Last day to withdraw from a course with a mark of "W" — both campuses (except for courses not scheduled for the full semester).

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

University Wide Policies

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.