Classroom presentations

A significant part of this class is dedicated to your own board presentations. The list of suggested exercises or statements that can be used for class presentations will be posted at

http://faculty.wwu.edu/benyia/teachingsummer2018.html

This list is updated regularly to reflect the statements already proved in class, so make sure to check it before attempting a given statement.

Part of your daily routine should be to: 1) read the text and 2) revise and critically assess the notes you have taken in class. While seeing the presentations of other students will contribute to your understanding of a given statement, in order to successfully complete this course, it is important that you attempt to prove and understand each listed exercise yourself. The expectation is that through this process you will build sufficient confidence in your mathematical capabilities, which in turn should reflect in progressively more mature presentations.

Each presentation will be graded on a 0-3 scale that measures the difficulty, quality, and correctness of each presentation. The grading scale is roughly as follows:

0 = no progress toward a correct proof
1 = completely correct and well written proof of a trivial exercise
1 = some good ideas towards a non-trivial exercise, but incomplete proof
2 = completely correct and well written proof of a non-trivial exercise
2 = good work towards a difficult exercise, but some math or writing errors
3 = completely correct work and well written proof of a difficult exercise

Besides the correctness of the mathematical content, the quality of a presentation is also judged upon being able to explain your method clearly so that the audience can follow your work, writing in legible English, and satisfactorily answering questions from the audience.
Please note that the time at the board is NOT to be spent on deciphering your notes! To this end, I strongly encourage you to write down on paper the proof of the problem/statement to be presented very carefully, with clear and concise explanations that, first and foremost, make sense to you.

You can discuss the text and class notes with other students. However, it should be a matter of honor not to use as your class presentation a problem for which you had substantial help from someone else (including me). To reiterate: any proof presented at the board must be essentially done by the one presenting it.

Towards a pleasant classroom atmosphere:

- Prepare for each class by reading the notes.
- Pay attention to the board presentations and strive to engage in the class discussions.
- If there is something unclear in an argument presented at the board, ask politely about it until you feel you received a satisfactory answer from the presenter.
- If you are a presenter, do not fret about your proof being wrong; making mistakes is part of the learning process.
- If there is a mistake in your argument, and you do not see how to fix it while at the board (within maximum 3 minutes), then make a graceful exit. You will be given one more opportunity, at a later date, to correct your error.
- If you are in the audience and you see how to fix a broken argument written at the board, resist the urge to tell the presenter how to do it. The job of the audience is to spot potential gaps, and, ideally, guide the presenter via questions to fill those gaps on her own.

Classes

There is no penalty for missing classes. Know, however, that your success in this class highly depends on your continuous active involvement. Mastering the material of this course is a gradual process. Studying only a few days before the exam and skipping class because you have nothing to present is a bad idea. Do not yield to the temptation of putting off work and getting behind with the material.

Student Learning Objectives

Math 312 is about proving various statements in elementary analysis. This course will help you achieve student learning outcomes of the mathematics department:

1) Understand the importance of abstraction and rigor in mathematics, ability to construct complete proofs and to critically examine the correctness of mathematical work and logical arguments.

2) Communicate mathematical results and arguments clearly, both orally and in writing.

More specifically, upon completion of the course you are expected to be able to construct proofs of statements involving the topics below and clearly present them at the blackboard:

- the properties of real numbers and its important subsets of integer and rational numbers
- the notions of countable set and uncountable set
- the completeness axiom and the notions of infimum and supremum
- definitions related to real sequences, such as boundedness, convergence, and Cauchy property
• the basic concepts of topology on the real line and in the plane
• the $\epsilon - \delta$ definition of continuity
• basic facts about continuous functions defined on a closed bounded interval.

Exams
You will have 2 take-home midterms due on the following Thursdays: July 12 and July 26. These midterms will be given out one day prior to the due date. There will also be a final exam; it will be comprehensive and is scheduled for Thursday, August 2, 12-2 pm.

Grading
Presentations: 50%, Midterms: 15% each, Final: 20%.
The formula that computes the percentage for the class presentations (CP) is

$$CP = 50 \min \left\{ \frac{P}{P_{av}}, 1 \right\},$$

where $P$ is the total number of points accumulated by you during the quarter, while $P_{av}$ is the class average.

Letter grades will be assigned according to the following percentage scale:
A (90–100), A- (86–89), B+ (82–85), B (78–81), B- (74–77), C+ (70–73),
C (66–69), C- (62–65), D+ (58–61), D (54–57), D- (50–53), F (0–49).

Course policies
If some health or family emergency would prevent you from missing an exam, you should contact me before the exam and I will make alternate arrangements. Once you take an exam, the score is recorded and cannot be adjusted or replaced under any circumstances.

Incomplete Grades/Academic Dishonesty
University guidelines as found in the Bulletin will be followed.