Mathematics 226 – WINTER 2016
LIMITS AND INFINITE SERIES
CRN # 10034 – MTRF 9:00–9:50 AM – Room MH 115

Instructor: Arpad Benyi, Professor
Office: BH 218
E-mail: arpad.benyi@wwu.edu
URL: http://faculty.wwu.edu/benyia/teachingwinter2016.html
Office Hours: MTRF 12:00–12:50
and by appointment

Text: Lecture Notes for Math 226
by Arpad Benyi (see website for the pdf file)

Prerequisites: Math 125, Math 133 or Math 128

Homework exercises

Homework will not be collected. However, in order to successfully complete this course, it is essential that you work on the listed exercises at the end of each section on a regular basis. This is an integral part of your learning process and ignoring it will very likely affect your overall class performance. While you are encouraged to work and discuss the problems in groups, it is important that you put in the effort to actually do and understand each problem on your own. I strongly encourage you to write down the solutions of the problems very carefully, by providing clear and concise explanations. This will make it easier on you when taking the exams or for the written assignments, where the same high standards of presentation will be expected. If you are uncertain of your work, check with me during the office hours.

How to be successful

• The expectations for this class are high. A passing grade requires good understanding of the theoretical concepts introduced (see also the sections about Classes and Grading).
• Know your basic algebra really well (see the posted Quiz 0).
• This class is about proofs, and the statements to be proved are about limits and series. You will be presented with some ideas to tackle some of these statements. Based on these ideas you will be asked to construct your own proofs of other statements. Stay involved and do not get behind!
• Start working early on problems! Do not wait to solve all the problems and then write them up, rather write solutions as you go. Include enough detail and revise your write-up later to see if you are still convinced by what you wrote. Write your solutions as if you were to explain it to someone that has not thought of it before.
Please note that in order for me to grade any exam or assignment, the writing has to be intelligible—this is an absolute must! -

- Do not introduce terminology without defining it, and do not use the same terminology for more than one thing. Differentiate between examples for which a conclusion holds and proofs that must apply to all possible examples.
- Ask me questions. After you describe the strategies you attempted and difficulties that you encountered, I will help you with a hint. Take this hint and try to work out the proof on your own.

Classes

There is no penalty for missing lectures. However, your class performance will be most likely affected by not attending lectures. For many of you, this course will be your first introduction to formal arguments in mathematical analysis and you should not treat this class as any of your “usual” courses. Your study habits will need to adjust accordingly if you wish to perform well. You will need to spend much more time on this class than you did in most previous mathematics classes. You will very likely struggle with the concepts mainly because now you will be required to transform an intuition about a concept into a convincing rigorous argument that obeys the standards set in class. Nevertheless, you should remember that struggling with difficult concepts is natural in the process of learning. Accepting this fact is the first step towards a positive learning experience. You are responsible for the material discussed in class as well as any additional assignments and announcements concerning the course made in class. If you are in class, turn off all your electronic gadgets and pay attention.

Student Learning Objectives

Math 226 is intended to be a bridge course between the calculus classes, which were mostly geared towards an intuitive approach of concepts, and the more formal and abstract treatment of mathematical analysis. You will mainly learn how to read and use mathematical definitions in proofs related to limits, continuity, sequences, series, and power series.

Upon completion of the course you are expected to
- understand the rigorous $\varepsilon - \delta$ definition of the key concept of limit
- know how to use the definitions to test examples
- be able to use examples to distinguish between various definitions
- demonstrate competence in computing limiting values of functions and sequences, and show that these values satisfy the appropriate definitions
- be able to decide continuity and use it to compute limits
- be able to decide the behavior of sequences and series
- be able to compute the values of series related to power series; in particular, Maclaurin and Taylor series
- apply power series in different contexts
Assignments and Exams

You will need to turn in two written assignments, handed out one week before they are due. There will also be two in-class exams on the following Mondays: February 1 and February 29. The final exam, scheduled for Thursday, March 17, 8-10 AM, is comprehensive. The problems in the assignments and exams will emphasize the understanding of concepts related to the material.

Grading

The in-class exams are worth 30%, the two assignments count for 40% and the final counts for 30% of your grade.
Letter grades will be assigned according to the following 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.