Mathematics 312 – SPRING 2010
PROOFS IN ELEMENTARY ANALYSIS
CRN # 20038 – MTWR 2:00–2:50 PM – Room BH 221

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Office Hours: MTWR 1:00–1:50 PM, and by appointment.

Text: Proofs in Elementary Analysis by Branko Curgus (Required)

Prerequisites: Math 226 and Math 302/Math 209

Classroom presentations

The list of suggested exercises or statements that can be used for class presentations (and, by default, as preparation for the exams) will be posted on my homepage at http://www.ac.wwu.edu/~benyia/teachingspring2010.html. Homework is a major part of the learning process in Mathematics. Part of your daily routine should be to revise and critically assess the notes you have taken in class. In order to successfully complete this course, it is important that you put in the effort to actually prove and understand each exercise yourself. Classroom presentations are an important part of this class. You will receive a grade (1, 2 or 3) that measures the difficulty, quality, and correctness of each presentation. For example, a difficult exercise that was solved mostly correctly and presented ineptly may receive a higher score than an easier one that was presented perfectly. You are encouraged to discuss problems and lecture 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). I strongly encourage you to write down the proofs of the problems/theorems very carefully, by using complete sentences that provide clear and concise explanations. This will make it easier for you to answer critical questions regarding a proof asked by your fellow students or the instructor.

Advice for a successful experience:
• The main source for success is you.
• Everything that is said in class and your record of it are your responsibility.
• Read the notes.
• Learning is your own responsibility. You can and should ask me questions during my office hours. My answers will almost always be hints or ideas for you to try further so that you get over certain difficulties you may encounter. Read again the section on class presentations.
The expectations for this class are high. A passing grade requires good understanding of the theoretical concepts introduced (see also Classes and Grading).

**Classes**

There is no penalty for missing classes. Be warned 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 really bad idea. Do not yield to the temptation of putting off work and getting behind with the material. This is a guaranteed recipe for failure.

**Topics and Expectations**

Math 312 is about proving statements that involve elementary analysis. 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
- understand the properties of real numbers and its important subsets of integers and rationals
- have knowledge of the completeness axiom and of the notions of infimum and supremum
- show competence in manipulating definitions related to real sequences, such as boundedness, convergence, Cauchy property
- understand the $\epsilon - \delta$ definition of continuity
- know basic facts about continuous functions, in particular defined on a closed bounded interval

**Exams**

There will be two in-class exams and a comprehensive final exam. The in-class exams are tentatively scheduled for Tuesday, April 27 and Thursday, May 27. The final exam is scheduled for Thursday, June 10, 1-4 PM (yes, three hours long!). If some health or family emergency would prevent you from missing an exam, you should contact me immediately before the exam and I will make alternate arrangements. This does not apply to the final exam, which cannot be taken neither early nor late. Make your travel plans accordingly!

**Grading**

Each exam and the total of classroom presentations will be graded by a number between 0 and 10. Your total score in the course ($S$) will be determined by the class presentations ($P$) and the three exams ($E_1, E_2, FE$) according to the following formula:

$$S = 0.2P + 0.25(E_1 + E_2) + 0.3FE.$$  

Your P grade will be determined by the following formula:

$$P = \min\{(E_1 + E_2 + FE)/3 + (E_1 + E_2)TP/12, 10\},$$
where $TP$ denotes the total number of points you have accumulated during the quarter. Letter grades will be assigned according to the following percentage scale: $100 \geq A \geq 90, 89 \geq A- \geq 85, 84 \geq B+ \geq 80, 79 \geq B \geq 75, \ldots, 54 \geq D \geq 50, 49 \geq F \geq 0$.

**Incomplete Grades/Academic Dishonesty**

University guidelines as found in the *Bulletin* will be followed.