Mathematics 226 – SUMMER 2010
LIMITS AND INFINITE SERIES
CRN # 30181 – MTWR 11:00–11:50 AM – Room BH 227

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Office Hours: MTWR 10:00–10:50 AM and by appointment.

Text: Lecture Notes for Math 226 by Arpad Benyi (Required)

Prerequisites: Math 125, Math 135 or Math 128

Suggested homework problems

A list of suggested homework problems is posted at
http://www.ac.wwu.edu/~benyia/teachingsummer2010.html

Homework is a major part of the learning process in Mathematics. It is essential that you work on the problems on a regular basis. You are encouraged to work and discuss the problems in groups. Furthermore, in order to successfully complete this course, it is important that you put in the effort to actually do and understand each problem yourself. I strongly encourage you to write down the solutions of the problems very carefully, by using complete sentences that provide clear and concise explanations. This will make it easier on you when taking the exams, where the same high standards of presentation will be expected. Solutions to selected problems, but you should try to solve all problems listed at the end of each section of the lecture notes. If you are uncertain of your work, check with me during the office hours.

There will be no homework collected!

Further advice for a successful learning experience:

• Start homework early; do not wait to solve all the problems and then write them up, rather write solutions as you go; include enough detail (more is better) 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 (that someone could be me grading your exam, and I do not grade unintelligible scribbling!).

• 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.

• 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. The best resource for being successful is you. Learning is your responsibility. Stay involved and do not get behind!

- 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.
- Know your basic algebra really well (this should have been the first item on the list).
- 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).

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 many 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. You are responsible for the material discussed in class as well as any additional assignments and announcements concerning the course made in class.

Cell phones, beepers, etc. must be turned off during class time!

Topics and Expectations

Math 226 is intended to be a bridge course between the calculus classes, that 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 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
- show ability to compute the values of series and compute power series
Exams

There will be 4 in-class exams on the following Thursdays: July 8, July 22, August 5, and August 19. The problems in the exams emphasize the *understanding of concepts* related to the material. Solutions to exam questions will be posted outside my office after each examination.

Grading

Your total score in the course (S) will be determined by the performance in the 4 in-class exams. Each exam ($E_1 - E_4$) will be graded on a scale from 0 to 10. Your final score (S) will be computed by the average of the four exam scores:

$$S = \frac{E_1 + E_2 + E_3 + E_4}{4}.$$

Letter grades will be assigned according to the following percentage scale: $100 \geq A \geq 90$, $90 > A- \geq 85$, $85 > B+ \geq 80$, $80 > B \geq 75$, $75 > B- \geq 70$, $70 > C+ \geq 67$, $67 > C \geq 63$, $63 > C- \geq 60$, $60 > D+ \geq 57$, $57 > D \geq 53$, $53 > D- \geq 50$, $50 > F \geq 0$.

Course policies

Calculators are allowed for all the exams. 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. 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.