

Mathematics 430 – Advanced Calculus I – FALL 2007

NEWS: TEST 1 on OCTOBER 17.

Prerequisites: Math 232 and Math 240, or Math 334

Textbook: Introduction to Analysis, 5th edition, by Edward D. Gaughan

Syllabus: The course content is contained in Chapters 0 through 5. Detailed projected syllabus is below.

Instructor information: Dr. ILYA KRISHTAL; office is Watson 371;
phone: 815-753-6769;
e-mail: krishtal @ math.niu.edu;
office hours are: M 4:00 – 5:00, R 1:00 – 2:00.

Grading System: Grades will be based on the accumulation of points out of 700 possible, of which 200 points are for homework, 300 points are for the two one-hour examinations, and 200 points are for the final examination. As a guideline, students should expect to attain 85% of the points for an A; 75% for a B; 60% for a C; and 50% for a D. The actual cut-offs will be adjusted relatively to the performance of the class. Projected dates for exams are Oct 17 and Nov 19. These are most likely to be adjusted depending on the pace of the class.

The information of the final examination will be posted as soon as it is available. I will maintain the webpage for the course.

Course objectives:

1. To enable the student to develop a basic understanding of certain new (to the student) mathematical concepts and to enhance the understanding of concepts previously encountered.
2. To develop further the student's idea of what constitutes proof, and to enhance the understanding of the need for precise language.
3. To enable the student to develop further the ability to read mathematics individually.
4. To enable the student to understand better how mathematicians think and develop their ideas.

Advice: DO NOT LAG BEHIND. The course is very intense and you may find it impossible to catch up.

Homework: Follow the [link](#) for up-to-date assignments. Homework due dates will vary from week to week. Often I will try to correct all of the assignments but give out grades only based on certain parts of it. Nevertheless, all of the h/w is absolutely crucial for your success in this class and you should seek guidance from me if you do not understand it. Unlike the case of exams, on h/w your co-operation with your peers is encouraged provided that you do not simply copy each other's mistakes and acknowledge the extent of this co-operation in the submitted papers.

ACADEMIC CONDUCT: Academic honesty and mutual respect (student with student and instructor with student) are expected in this course. Mutual respect means being on time for class and not leaving early, being prepared to give full attention to class work, not reading newspapers or other material in class, not using cell phones or pagers during class time, and not looking at another student's work during exams. Academic misconduct, as defined by the Student Judicial Code, will not be treated lightly.

CAAR STATEMENT: If you have specific physical, psychiatric, or learning disabilities and require accommodations, please let your instructor know early in the semester so that your learning needs may be appropriately met. You will need to provide documentation of your disability to the CAAR (Center for Access Ability Resources) Office located in the Health Services Building, 4th floor.

PROJECTED SYLLABUS

Week 1	Chapter 0	Sets, set theoretic operations, functions, induction
Week 2	Chapter 0	The field of real numbers: axioms and properties
Week 3	Chapter 1	Sequences, limits of sequences, algebra of limits
Week 4	Chapter 1	Convergence of Cauchy sequences,
Week 5	Chapter 1 Chapter 2	Monotone sequences, Examples Functions, limits of functions
Week 6	Chapter 2	Limits of functions vs. limits of sequences, algebra of limits
Week 7	Chapter 2	Limits of monotone functions, Continuity at a point, Review
Week 8	Chapter 3	Test 1, algebra of continuous functions
Week 9	Chapter 3	Uniform continuity, topology
Week 10	Chapter 3	Bolzano, Heine-Borel, Intermediate Value theorems
Week 11	Chapter 4	Differentiation, algebra of derivatives
Week 12	Chapter 4	Mean value theorem, L'Hospital rule
Week 13	Chapter 4	Inverse Function theorem, Review, Test 3
Week 14	Chapter 5	Riemann sums, integral, integrable functions
Week 15	Chapter 5	FTC, Final review.