MATH 361: Advanced Calculus (Fall 2009)

Class Hours: MWF 11–12am, 1-122 Wilson Hall

Instructor: Lukas Geyer, 2-254 Wilson, Tel. *5342,
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Office Hours: M 10-11am, W 3-4pm, Th 10-11am, or by appointment

Website: `http://www.math.montana.edu/~geyer/2009/fall/361.html`

Required Text: Witold Kosmala, *A Friendly Introduction to Analysis; Single and Multivariable*, 2nd ed., Pearson, 2004.

Prerequisites: Math 224, and either Math 256, Math 333, or consent by instructor.

Course description. This is an "Advanced Calculus" course. In the first semester the emphasis of this course is only partly on mathematical results that are new to the students. The focus is primarily on learning the modern rigorous approach to mathematics in the context of calculus. The "Calculus" component includes many familiar results. What makes the material "Advanced" is the strong emphasis on proof and precision.

The calculus component includes sets, real numbers, sequences, limits, continuity, and differentiation.

The proof component includes proof techniques, concept definitions, precisely stated theorems, conditional statements, hypotheses and conclusions, logic for mathematics, truth and falsehood, conjectures, counterexamples when statements are false, and rigorous proofs.

We will cover chapters 1–5 in Kosmala, with a few omissions.

The course continues in the second semester as Math 362. As the course progresses and the rigorous approach is assimilated, more and more of the results will be new.

Grading. Homework will count 200 points. Three one-hour tests will be 100 points each, and the final will be 200 points. Quizzes and class participation will count for another 100 points. Cooperation on homework is encouraged, but please write up your solutions yourself.

Final Exam: Tuesday, December 15, 4–5:50pm.