

MAT 412 Fall 2011 MW 3:45-5:05 CARN 208

Professor A. Vogel 229F Physics Building, phone 3-1584, email alvogel@syr.edu Office hours: TuTh, 10:00-11:00pm, MW, 9:00-10:00pm, and by appointment.

Prerequisites A desire and ability to write and understand proofs, MAT 275, MAT 397.

Book *An Introduction to Analysis* Wade, Prentice Hall, fourth edition.

Course Content Chapters 1-7 (more if time allows), Real numbers, sequences, functions, differentiability, integrability, series. An approximate ordering of the course is:

- Chapter 1 (2 Lectures) Most of this was covered in MAT 275, what's new is the Real numbers as a **complete** ordered field. You will need to read sections 4, 5, 6 on your own and work some problems to recall the material from MAT 275. We will use this material throughout the semester.
- Chapter 2 (3 Lectures) Limits of Sequences, Bolzano-Weierstrass theorem, Cauchy sequences. Depending on time we may skip 2.5
- Chapter 3 (3 Lectures) Limits of functions, Continuity, Uniform Continuity.
- Test 1 October 3
- Chapter 4 (4 Lectures) Differentiation, Mean Value Theorem, Taylor's Theorem, l'hôpital's rule, some inverse functions.
- Chapter 5 (3 Lectures) Riemann Integration, Fundamental Theorem of Calculus, Improper Integrals. skip 5.5, 5.6
- Chapter 6 (3 Lectures) Series of nonnegative terms, Absolute convergence, Alternating Series. skip 6.5, 6.6
- Test 2 November 7
- Chapter 7 (4 Lectures) Series of functions, Power series, Analytic functions. skip 7.5
- Chapter 8 as time permits

Grading There will be two semester exams (25%) on October 3 and November 7, a final exam(30%), and weekly written homework(20%).

Students with Disabilities: If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), <http://disabilityservices.syr.edu>, located in Room 309 of 804 University Avenue, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented disabilities Accommodation

Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible. You are also welcome to contact me privately to discuss your academic needs although I cannot arrange for disability-related accommodations. Making arrangements with ODS takes time. Do not wait until just before the first test.

Academic Integrity: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see <http://academic.integrity.syr.edu>

Learning goals · understanding the nature and role of deductive reasoning in mathematics

- ability to use and understand the usage of mathematical notation
- ability to follow proofs and other mathematical discourse
- ability to write rigorous proofs of mathematical statements