

MAT 412 Fall 2012 MW 12:45-2:05 CARN 208

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Office hours: TuTh, 10:00-11:00am, MW, 10:00-11:00am, and by appointment.

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

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

Course Content Chapters 1-4 (some of 5 as time allows), Real numbers, sequences, functions, differentiability, integrability. An approximate order of events is:

1. Chapter 1 Most of this was covered in MAT 275, what's new is the Real numbers as a complete ordered field sections 1.2 and 1.3. You are responsible for recalling, reading the rest of the material in chapter one.
2. Chapter 2 Sequences, Bolzano-Weierstrass, Cauchy-sequences in sections 2.1-2.4, and limsup and liminf in section 2.5.
3. Test 1
4. Chapter 3 limits of functions, Continuity, Uniform Continuity in sections 3.1-3.4
5. Test 2
6. Chapter 4 Derivatives, Mean Value Theorem, Taylor's Theorem, L'Hospital's rule, Inverse function theorem. Sections 4.1-4.5. Chapter 5 as time permits
7. Final Exam

Grading There will be two semester exams (25%) on October 1 and November 5, 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.

Related link: <http://disabilityservices.syr.edu/faculty-staff/syllabus-statement/>

Religious observances policy. SU religious observances policy recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to are religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice (Student Services -> Enrollment -> My Religious Observances) from the first day of class until the end of the second week of class.

Related link: http://supolicies.syr.edu/studs/religious_observance.htm

Academic Integrity Syracuse University sets high standards for academic integrity. Those standards are supported and enforced by students, including those who serve as academic integrity hearing panel members and hearing officers. The presumptive sanction for a first offense is course failure, accompanied by the transcript notation "Violation of the Academic

Integrity Policy”. The standard sanction for a first offense by graduate students is suspension or expulsion. Students should review the Office of Academic Integrity online resource “Twenty Questions and Answers About the Syracuse University Academic Integrity Policy” and confer with instructors about course-specific citation methods, permitted collaboration (if any), and rules for examinations. The Policy also governs the veracity of signatures on attendance sheets and other verification of participation in class activities. Additional guidance for students can be found in the Office of Academic Integrity resource: “What does academic integrity mean?”

Related links:

The Academic Integrity Policy: <http://academicintegrity.syr.edu/academic-integrity-policy/>

Twenty Questions and Answers about the Academic Integrity Policy:

<http://academicintegrity.syr.edu/faculty-resources/>

What does academic integrity mean?: <http://academicintegrity.syr.edu/what-does-academic-integrity-mean/>

Learning outcomes

For all Math courses:

- Students will be able to use and understand the usage of mathematical notation
- Students will be able to select an appropriate mathematical model for a given real world problem
- Students will be able to do hand calculations accurately and appropriately
- Students will be able to do calculations with the aid of appropriate hardware and/or software

For all Math courses MAT 275, 295 and above:

- Students will understand the nature and role of deductive reasoning in mathematics
- Students will be able to follow proofs and other mathematical discourse
- Students will be able to write simple proofs in the major proof formats (direct, indirect, inductive), and, more generally, to engage in mathematical discourse
- Students will be able to apprehend and enunciate the limitations of conclusions drawn from mathematical models

For all Math majors:

- Students will have a basic knowledge of the contributions and significance of important historical figures in mathematics
- Students will have a basic knowledge of the major modern theories of analysis, abstract algebra, geometry, and applied mathematics
- Students will be able to effectively use mathematical word processing software
- Students will have a basic understanding of career options available to mathematics majors
- Students will be able to locate and use sources and tools that aid mathematical scholarship

