

**MAT 412 – Introduction to Real Analysis I,
Fall 2018, Section M001
TuTh 9:30am-10:50am, 200 Carnegie**

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Prerequisites: (MAT 375 OR CIS 375) AND MAT 397. Students are expected to be able to write and understand proofs.

Textbook: *Introduction to Real Analysis* (4th ed.) by W. Wade, ISBN 9780132296380. The course material is based on Chapters 1-4.

Course Content: Introduction to the foundations of calculus covering topics from the following: the real number system, functions, limits, sequences, infinite series, continuity, uniform continuity, and derivatives.

- **Chapter 1** Some of this was covered in MAT 375. What is new is the real numbers as a complete ordered field (Sections 1.2 and 1.3). You are responsible for learning or recalling the rest of the material in Chapter 1.
- **Chapter 2** Sequences, Bolzano-Weierstrass theorem, Cauchy sequences (Sections 2.1- 2.4).
- **Chapter 3** Limits of functions, Continuity, Uniform Continuity (Sections 3.1-3.4).
- **Chapter 4** Derivatives, Mean Value Theorem, Taylor's Theorem, L'Hospital's rule, Inverse function theorem (Sections 4.1-4.5).

Grading:

First test: Thursday, October 4, 9:30am-10:50am. 25%

Second test: Thursday, November 15, 9:30am-10:50am. 25%

Final exam: Monday, Dec 10, 12:45pm-2:45pm. 30%

Homework: 20%

There are no calculators or electronic devices of any kind allowed during the exam. Tests will be given in lecture. The final exam will be cumulative. There will be **no make-ups** for the test or final exam. If you have an excused absence for one of the tests, your grade on the relevant portion of the final will be used.

Homework:

*I hear, and I forget;
I see, and I remember;
I do, and I understand.*

-Proverb

The key to success in this course is to master the homework. Homework will be assigned and collected weekly at the beginning of class, usually on Thursdays, not including exam weeks. **No late homework** will be accepted. Homework has to be neat and professional when submitted. A portion of the homework problems will be graded. You are encouraged to discuss the homework problems with your classmates and to work together, but submitted assignments must be written up individually.

Quizzes: As needed there will be quizzes that will influence either the homework or the test portion of your semester grade.

Attendance: You are expected to attend every class. If you **must** miss a class for some reason, it will be up to you to find out from me or other members of the class what you missed including any announcements concerning homework, quizzes, or exams that were made during the class. You are highly encouraged to ask questions in class.

Learning Goals:

- Understand the nature and role of deductive reasoning in mathematics.
- Use and understand the usage of mathematical notation.
- To be able to analyze mathematical statements.
- Follow proofs and other mathematical discourse.
- Write rigorous proofs of mathematical statements.

Students with Disabilities: If you believe that you need academic adjustments (accommodations) for a disability, please contact the Office of Disability Services (ODS), visit the Office of Disability Services website <http://disabilityservices.syr.edu>, located in Room 309 of 804 University Avenue, or call (315) 443-4498 or TDD: (315) 443-1371 for an appointment to discuss your needs and the process for requesting academic adjustments. ODS is responsible for coordinating disability-related academic adjustments and will issue students with documented Disabilities Accommodation Authorization Letters, as appropriate. Since academic adjustments may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

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 a 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.

Academic Integrity: Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. SU students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. The Violation and Sanction Classification Rubric establishes recommended guidelines for the determination of grade penalties by faculty and instructors, while also giving them discretion to select the grade penalty they believe most suitable, including course failure, regardless of violation level. Any established violation in this course may result in course failure regardless of violation level. For more information and the complete policy, see <http://class.syr.edu/academic-integrity>.

Tips for success in this course:

- 1) It is absolutely essential that you understand how to solve all the assigned problems. Once you understand how to solve a problem, write your solution down neatly and in full detail with explanations that make your reasoning clear.
- 2) Don't fall behind! The material is built on cumulatively, thus you need to stay on top of the material at every stage. If you are having difficulty, see me immediately to discuss the problem!
- 3) Take advantage of office hours.
- 4) Discussing problems with a classmate is very useful.
- 5) Again, questions in class are strongly encouraged.
- 6) I believe you can be successful in this course! You should expect to work hard. Don't get discouraged if you find some of the material difficult. Be persistent and patient! If you follow the above suggestions, your experience in this course will be a rewarding one.

I look forward to a great semester!