

Spring Semester 2016
MATH 6253: Mathematical Analysis I

Instructor: Dr. Vu Kim Tuan

Time & Location: TR 5:30 PM - 6:50 PM, Boyd 307

Office: Boyd 325

Office Hours: TR 5:00 PM-5:30 PM, 6:50 PM-7:30 PM, or by appointment. Please contact me only through campus MyUWG e-mail or in person.

Phone: 678-839-4135

E-mail: vu@westga.edu

Hours Credit: 3 hours

Prerequisites: MATH 3003 Advanced Calculus

Textbook: W. Rudin, *Principles of Mathematical Analysis*, 3rd Edition, McGraw-Hill, Inc., New York, 1976

Course Description: This course is the first course in the graduate Analysis sequence. It gives a satisfactory discussion of main concepts of analysis, such as convergence, continuity, differentiation, and integration.

Topics:

- 1- The Real and Complex Number Systems
- 2- Basic Topological Properties of Real Line
- 3- Numerical Sequences and Series
- 4- Continuity of Functions
- 5- Differentiation
- 6- The Riemann-Stieltjes Integral
- 7- Sequences and Series of Functions
- 8- The Lebesgue Theory

Learning Outcomes: It is expected that the student who completes this course will:

- 1- Be able to apply the completeness of the real and complex number system and Euclidean spaces to study the continuity, differentiability, and other properties of functions
- 2- Demonstrate her/his knowledge on basic topological properties of metric spaces by applying them to study the convergence of sequences, the continuity of functions
- 3- Be able to use basic techniques in solving problems involving numerical and functional series
- 4- Understand and be able to use basic properties of continuous functions in problem solving
- 5- Understand and be able to apply the concepts of Riemann-Stieltjes integral
- 6- Improve her/his ability to read and comprehend mathematical statements and proofs using the uniform convergence, the Arzela-Ascoli Theorem and the Stone-Weierstrass Theorem
- 7- Be able to comprehend mathematical statements and proofs using the Lebesgue measure, measure spaces, the Lebesgue integral.

Tests: There will be two in-class tests and two take-home tests worth 100 points each. Take-home tests are supposed to be completed *individually*. You can request to drop one test (say Test X). In that case your Bonus Test will cover topics of Test X, and your new Test X score = $\max\{\text{old Test X score, Bonus Test score}\}$. No make-up for missing a test.

Final Exam: No comprehensive final examination.

Important Dates: 2/4 : Test 1 (Take home) Due 2/9 at 5:30 PM
3/3 : Test 2 (In class)
3/31 : Test 3 (Take home) Due 4/5 at 5:30 PM
4/19 : Test 4 (In class)
4/26 : Bonus Test (In class), 5PM-7:30PM

Grading: The final letter grade will be determined by the following scale:
A = 360-400, B = 320-<360, C = 280-<320, F = below 280

Homework: This is an important part of the course. At the end of most classes you will be given a list of problems – these are the minimum that you should work on. These problems will not be graded. Some of these problems will be gone over in the next class session and some might be included into the in-class tests. Practice is important. An important part of each homework assignment is to read the corresponding material in the text. I encourage you to use my office hours if you have any questions. You should make sure to set aside some time every class day to work problems.

Disabilities: Students with documented disabilities (through West Georgia's Disability Services) will be given all reasonable accommodations. Students must take the responsibility to make their disability known and request academic adjustments or auxiliary aids. Adjustments needed in relation to test-taking must be brought to the instructor's attention well in advance of the test (at least one week prior).

Attendance Policy: You are expected to attend every class. Although absences are not penalized, if a class is missed, you are responsible for all material and assignments.

Academic Honesty: You are expected to achieve and maintain the highest standards of academic honesty and excellence as described in the Graduate Catalog. In short, be responsible and do your own work.