

# Analysis I Syllabus

**Instructor:** Dr. Shijun Zheng

**Lecture Hours & Location:** (Math 5331 A/G) MW 3:30-4:45. MP 1315

**Office:** MP 3044

**Phone:** 478-1338

**Office Hours:** TR 2:00-3:30 or by appointment.

**E-Mail:** szheng@georgiasouthern.edu

**Course Web:** <http://math.georgiasouthern.edu/~szheng>

**Text:** *Analysis with an Introduction to Proof*, 4th Edition, Steven R. Lay

**References:** *Analysis I*, Terence Tao, 2006

<http://www.ams.org/bookstore-getitem/item=HIN-28>

*Elementary Analysis*, K. Ross, 2003 edition.

*Principles of Mathematical Analysis*, W. Rudin

*Advanced Calculus*, Gerald B. Folland, Prentice-Hall, 2002.

*Fourier Analysis and its Applications*. Gerald B. Folland.

*Real Analysis and Foundations*, Steven G. Krantz, CRC Press, Boca Raton 1991.

**Course Description:** We will study selected topics from Chapters 2-9 in the text. Analysis I is an introduction to real analysis and is intended for undergraduate and graduate students, who have already been exposed to calculus. The emphasis is on rigour and on foundations. The material starts at the very beginning - the construction of the number systems and set theory, then to the basics of analysis (limits, series, continuity, differentiation, Riemann integration), through to power series, several variable calculus and Fourier analysis, and finally to the Lebesgue integral; these are almost entirely set in the concrete setting of the real line and Euclidean spaces, although there is some material on abstract metric and topological spaces. This course covers the elementary concepts of Analysis with an emphasis on understanding and constructing mathematical proofs. Rigorous development of fundamental concepts, such as convergence, continuity, differentiation and integration of functions of one real variable; topology, compact sets, sequences and metric spaces.

**Course Objectives:** Students will demonstrate their understanding of basic concepts of analysis of one variable. Students will learn to understand

and construct mathematical proofs.

**Prerequisites:** Grade of C or better in Math 2443 (Calculus III) and Math 2332 (Mathematical Structures). You should have knowledge of: logic and proofs, set theory, relations, functions, cardinality, mathematical induction.

**Grading:** Your course grade will be based on the percentage of total points you have earned divided by the number of total points available. An approximation of the number of points available during the semester is: 150 points for homework and class participation, 2 tests worth 100 points each for a total of 200 points, and a cumulative final exam worth 150 points. The approximate total points available is then 500.

The grading scale is: A 85% or above; B 70–84 %; C 60-69%; D 50-59%; and F 49% or below.

**Homework:** *Practice on homework problems is strongly recommended.* Sometimes group work may also be assigned.

**Academic honesty:** Unless otherwise indicated, it is taken for granted that all work is your own.

**Tutoring:** The Academic Success Center (ASC) offers free peer tutoring during the week. Contact the tutorial centers for exact hours at 681-0321 or <http://academics.georgiasouthern.edu/success/>.