Math 3210 - 3 Foundations of Analysis I November 4, 2014

Credit Hours: Four

Meeting Time: M, T, W, F, 10:45 - 11:35 AM in WBB 207.

Homepage: http://www.math.utah.edu/~treiberg/M3216.html

Instructor: Prof. A. Treibergs, JWB 224, 581 - 8350.
Office Hours: M, T, F 11:45 AM - 12:45 PM (tent.) & by appt.
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Prerequisites: "C" or better in ((MATH 2210 OR MATH 1260 OR MATH 1280 OR MATH 1321 OR MATH 3140) AND (MATH 2200 OR MATH 2270 OR MATH 2250)).

Text: Joseph L. Taylor, Foundations of Analysis, American Mathematical Society, Providence 2012.
ISBN 978-0-8218-8984-8

Course Description:
Logic, methods of proof and mathematical argument in mathematical analysis. Rigorous reconsideration of the real-number system, infinite series and of continuity, differentiation and integration for functions of one variable. The emphasis is on improving the student's ability to understand and explain concepts in a logical and complete manner.

Topics: The theory of one variable calculus and the essentials of the professional mathematician: logic, proof and the writing of a mathematical argument. We will cover most or all of the following chapters

Chapter 0 - Review Sets, Logic, Quantifiers, Functions. (2 Lectures)
Chapter 1 - The Real Numbers (10 Lectures)
Chapter 2 - Sequences (9 Lectures)
Chapter 3 - Continuous Functions (9 Lectures)
Chapter 4 - The Derivative (8 Lectures)
Chapter 5 - The Integral (6 Lectures)
Chapter 6 - Infinite Series (6 Lectures)

Expected Learning Outcomes:
Upon successful completion of Math 3210 - Foundations of Analysis I , students will be able to:
Describe the real line as a complete, ordered field;
Determine the basic topological properties of subsets of the real numbers;
Use the definitions of convergence to approximate by sequences, series, and functions;
Determine the continuity, differentiability, and integrability of functions defined on subsets of the real line;
Apply the Mean Value Theorem and the Fundamental Theorem of Calculus to problems in the context of real analysis, and
Understand definitions and produce rigorous proofs of results that arise in the context of real analysis.

Write solutions to problems and proofs of theorems that meet rigorous standards based on content, organization and coherence, argument and support, and style and mechanics.

Teaching and Learning Methods:

Material will be presented in lectures and read from the text and other sources. Students will solidify their learning by solving problems assigned weekly. Students will ask questions and present solutions in regular classroom discussions. Students may benefit from one-on-one instruction by consulting the instructor during office hours.

Evaluation Methods and Grading

Homework: To be assigned weekly.

Homework will be due Fridays and will be collected in class. Papers turned into the graders, Eric Longberg's mailbox in the math mail room (JWB 228) by 1:30 PM Fridays before he leaves will be regarded as being turned in on time. Homework that is late but not more than one week late will receive half credit. Homework that is more than one week late will receive no credit at all.

Exams: Exams will be closed book except that you will be allowed

to bring a "cheat sheet," an 8.5" x 11" piece of paper with notes on both sides. Your text, notes, homework papers, calculators laptops, tablets, phones, text messaging devices, and other books will not be allowed.

Midterms: There will be three in-class one-hour midterm exams on Wednesdays Sept. 10, Oct. 8 and Nov. 12.

Final Exam: Mon., Dec. 15, 10:30 AM - 12:30 PM. Half of the final will be devoted to material covered after the third midterm exam. The other half will be comprehensive. Students must take the final to pass the course.

Course grade: Best two of three midterms 40% + HW 30% + final 30%. Grades will be assigned "on the curve."

Withdrawals: Last day to register is Sept. 8. Last day to drop class is Sept. 19.Until Oct. 24 you can withdraw from class with no approval at all. After that date you must petition your dean's office to be allowed to withdraw.

ADA: The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given the Center for

Disability Services,
162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with
you and the instructor to make arrangements for accommodations.
All information in this course can be made available in alternate
format with prior notification to the Center for Disability
Services (www.hr.utah.edu/oeo/ada/guide/faculty/)

Faculty and Student Responsibilities:
All students are expected to maintain professional behavior in the
classroom setting, according to the Student Code, spelled out in
the Student handbook. Students have specific rights in the classroom
as detailed in Article III of the Code. The Code also specifies
proscribed conduct (Article XI) that involves cheating on tests,
plagiarism and/or collusion, as well as fraud, theft, etc. Students
should read the Code carefully and know they are responsible for
the content. According to the Faculty Rules and Regulations, it is
faculty responsibility to enforce responsible classroom behaviors,
beginning with verbal warnings and progressing to dismissal from
class and a failing grade. Students have the right to appeal such
action to the Student Behavior Committee. Faculty must strive in
the classroom to maintain a climate conductive to thinking and
learning (PPM 6-316). Students have a right to support and assistance

from the University in maintaining a climate conducive to thinking and learning (PPM 6-400).

Note: The syllabus is not a binding legal contract. It may be modified by the instructor when the student is given reasonable notice of the modification.