

**MATH 5210, INTRODUCTION TO REAL ANALYSIS,  
SPRING 2015**

**Classroom:** LCB 219                   **Time:** M,T,W,F 2:00 – 2:50  
**Instructor:** Domingo Toledo  
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**Office:** JWB 324                   **Phone:** (801) 581-7824  
**Office Hours:** Mon,Tue 12:55-1:45 or by appointment.  
**Web-page:** <http://www.math.utah.edu/%7Etoledo/5210S15.html>  
**Prerequisite:** Grade of “C” or better in Math 3220.  
**Textbook:** W. Rudin *Principles of Mathematical Analysis*,  
Third Edition, ISBN 0-07-054235-X.

**Course Description:** Metric spaces, fixed-point theorems and applications, Lebesgue integral, normed linear spaces, approximation, the Fundamental Theorem of Calculus.

**Topics:**

Metric spaces, completeness (Chapters 2 and 3 of Rudin and Notes),  
Spaces of continuous functions (Chapter 7),  
Applications of the contraction mapping theorem:  
ordinary differential equations, inverse function theorem  
(Chapter 9 and notes),  
Special functions, Fourier series (Chapter 8),  
Lebesgue integral (Chapter 11),  
Possibly other topics of interest to the class.

Some chapters in Rudin, particularly Chapters 1, 3, 4, 5, 6, contain material that should be mostly familiar from Math 3210 – 3220. These include continuity and differentiability of functions of one real variable, and the Riemann integral. I will assume that you know these topics. If this is not the case, please let me know if you want some discussion of any particular topic.

Rudin’s book will be used loosely as a basic reference. We will cover material that is not in that book, and supplementary notes will be provided.

**Homework:** I will be assigning homework problems to be collected roughly every week. The homework problems are the most important part of the course. You should do all the problems, and get any help you need in

understanding how to solve the problems and how they all fit together. I will try to devote one class session each week to discussion of the problems. Feel free to ask questions any time, and to see me in my office.

**Exams:** There will be two midterm exams on February 11 and April 1, and a comprehensive final exam on Thursday, April 30, 1–3 PM, in the usual classroom. The examinations will test knowledge of basic definitions and theorems, and will be closed book and closed notes. The more difficult problems will be in the homework, where you can consult any source that may be helpful.

<b>Grading:</b> Homework, drop lowest 2:	35 %
Midterm Exams:	40 %
Final Exam:	25 %

**Important dates:**

Last day to add classes without permission code: Monday January 19.

Last day to drop (delete) classes: Wednesday, January 21.

Tuition due: Monday January 26.

Last day to withdraw from classes: Friday, March 6.

**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. You 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, collusion, fraud, theft, etc. Students should read the Code carefully and know you are responsible for the content. According to Faculty Rules and Regulations, it is the 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. <http://regulations.utah.edu/academics/6-400.php>

**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 the class, reasonable prior notice needs to be given to the Center for Disability Services (CDS), 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and me to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to CDS.