

M 365C – Real Analysis 1

- Unique Number: 58760
- Class Meetings: MWF 9:00 – 10:00 am RLM 6.122
- Instructor: Alistair Windsor, RLM 10.132
Email: awindsor@math.utexas.edu
Ph: 471-1141
Office Hours: MWF 10:00 – 11:00 am and by appointment.
- Course Description: This course is an introduction to Analysis.
- Text: Michael Reed “Fundamental Ideas in Analysis”
Supplementary Material will be provided in class.
- Assessment: 20% homework
20% first in-class test
20% second in-class test
40% comprehensive final
- Homework: There will be weekly assignments. You are welcome to discuss your solutions but you must submit your own work. *Material on the homework is examinable.* Homework is primarily a learning aid and not an assessment device. *Homework will be collected at the start of class. Late homework will NOT be accepted without prior arrangement.*
- Academic Integrity: Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information please visit the Student Judicial Services website at <http://www.utexas.edu/depts/dos/sjs/>
- Disabilities: The University of Texas provides, upon request, appropriate academic accommodations for qualified students with disabilities. For more information please contact the Office of the Dean of Students at 471-6259, 471-4641 TTY.

Advice:

Successful students will

1. Attend class
2. Ask questions in class
3. Complete the homework
4. Seek help in office hours
5. Study your notes after each class

Outline:

1. **Preliminaries**
Elementary Set Theory
Functions
Cardinality
2. **Metric Spaces and Sequences**
Metric Spaces
Examples
Convergence of Sequences
Cauchy Sequences and Completeness
Compactness
3. **Theorems on Sequences**
Normed Linear Spaces
Limit Theorems for Sequences
Monotone Real Sequences
Supremum and Infimum
Bolzano-Weierstrass Theorem
4. **Continuity**
Continuous Functions
Continuous Functions and Limits
Theorems on Continuous Functions
Continuous Functions on Compact Sets
5. **Riemann Integral**
Riemann Integration
Theorems on Riemann Integration
6. **Differentiation**
Differentiable Functions
Mean Value Theorem
Fundamental Theorem of Calculus
Taylor's Theorem and Remainders
7. **Sequences of Functions**
Pointwise vs. Uniform convergence
Limit Theorems: Continuity and Integrals
The Supremum Norm and Completeness