

MATH 112: Introductory Real Analysis
Tuesday and Thursday 1:00 - 2:30 PM
Science Center 507

Instructor: Tristan Collins, Science Center 233

Office Hours: 12:00-1:00 PM Monday and Thursday.

Textbooks:

- (required) Principles of Mathematical Analysis, 3rd Ed.- Walter Rudin

Course Outline:

The Real Number System

- Ordered Fields
- Least Upper Bounds

Topology

- Finite, Countable and Uncountable Sets
- Metric Spaces
- Compact Sets
- Heine-Borel Theorem

Sequences and Series

- Convergence
- Cauchy Sequences
- Series

Continuity

- Continuous Functions
- Continuity and Compactness
- Continuity and Connectedness
- Monotonic Functions

Differentiation

- The Derivative

- Mean Value Theorems
- L'Hopit als rule

The Riemann-Stieltjes Integral

- Definition and Existence of the Integral
- Properties of the Integral
- Integration and Differentiation

Sequences and Series of Functions

- Discussion of the Main Problem
- Uniform Convergence
- Uniform Convergence and Continuity
- Uniform Convergence and Differentiation
- Uniform Convergence and Integration

Prerequisites: Math 21a,b and either an ability to write proofs or concurrent enrollment in Mathematics 101.

Homework: There will be weekly assignments, posted on Tuesday, which are to be turned in to the Math 112 mailbox by the following Tuesday at 5:00 pm. Late homework will not be accepted. Please staple or paper clip your homework, and remember to write your name on it!

Exams: There will be two midterm exams, which will be held in approximately week 5 and week 10. There will also be a cumulative final exam, which will be in class.

Grading: The final grade will be computed in the following way: Homework: 20%, Midterms: 20% each, Final: 40%.

Collaboration: I encourage students to collaborate on their homework. However, it is absolutely essential that students write up their own solutions. Collaboration extends to discussion amongst classmates and peers, but *DOES NOT* include the use of online resources of any kind (eg. Math Stack Exchange, online solutions manuals etc.). Collaboration on the final exam is prohibited.

Important Dates:

First Midterm Tuesday, February 23 (tentative)
 Spring Recess Saturday, March 12 - Sunday, March 20
 Second Midterm Tuesday, April 5 (tentative)
 Last Day of Class Tuesday, April 27