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'Hôpital's 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