

This course will give an introduction to important basic concepts in modern analysis. Concretely we will talk about sequences and series of real numbers and of functions, but along the way we will isolate the relevant abstract concepts. So we will also talk about the completeness of the real numbers, Cauchy sequences, triangle inequality, and basic topological notions, like open, closed and compact sets. These concepts will be applied to perform simple calculations with infinite series.

An important feature of the course is that it might confront many of the students for the first time with a rigorous development of the subject. We will thus also spend some time on becoming familiar with the language and methods of mathematics (in particular, quantifiers and basic techniques for proofs).

**Textbook:** *Notes for Math 281*

by D. Norman and O. Nielsen

**Prerequisite:** MATH-120 and 110, or APSC-171 and 172\* and 174\*  
(and preferably MATH-280\*).

**Instructor:** J. Mingo

<b>Evaluation:</b>	Homework	10%
	Quizzes	20%
	Final Examination	70%

**Outline:**

Language and Methods of Mathematics

Basic properties of the real numbers

Sequences of real numbers

Series of real numbers

Sequences in  $\mathbf{R}^d$

Some topology: open and closed sets

Some more topology: compact sets

Sequences of functions

Power series and Taylor series

Functions of several variables (if time permits)