MAT 180: Invitation to Classical Analysis

Course Description: This course explores classical and important topics in analysis that tend to be left out and neglected in the modern curriculum of analysis (e.g., Rudin's book or MAT 127ABC) after students learned basic calculus (MAT 21 series). I plan to use the following fantastic books (though not required textbooks but strongly recommended to get):

- Peter Duren: Invitation to Classical Analysis, 2012, Amer. Math. Soc.
- Paul J. Nahin: In Pursuit of Zeta-3, 2021, Princeton Univ. Press.

Topics to be covered (but not limited to):

- Approximation by Polynomials
- The Gamma Function
- The Zeta Function
- Bernoulli Numbers and the Euler-Maclaurin Formula
- Hypergeometric Functions
- Elliptic Integrals

These will motivate many of our students who learned abstract concepts and techniques in calculus and analysis, yet are left wandering what to do with them.

Prerequisite: MAT 21 ABC with C- or above; also preferably MAT 127AB with C- or above.

Grading Scheme: Use the combination of class attendance, homework, and/or final exam. Precise weights among these are yet to be determined.