MME 523   Fall 2021

Applications of Analysis

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office hours: Tuesday 2 to 3:30 **or** by appointment. Help by email always available! 18/7

        Monday 2 to 4

        Thursday 2 to 4

        Friday 2 to 3

Textbook: *Calculus: Early Transcendentals* Edwards and Penney (2008) 7th ed

ISBNs:

ISBN-10	0131569899
ISBN-13	9780131569898

Content Topics

Limits   in the end calculus is about limits. The rest, as they say, is details

Review of Elementary Calculus

        Differentiation
        Integration

Using Matlab
        Functions, derivatives, integrals, plots, sums

Series

        Notation
        Arithmetic , Geometric , Telescoping

        Proofs by Induction
Using Excel to demo

Differentiation

        concepts
        Mean Value Theorem

Integration

        Concept

Riemann Sums , Trapezoid Rule
Approximations
Fundamental Theorem of Calculus **x**

Historical Considerations

Archimedes , Newton, Leibniz

Improper Integrals

Bell Curves
Diffusion

Infinite Series

Sequences and convergence
Geometric, p series, harmonic
Tests for Convergence
Integral
Comparison, root, nth term
Error estimation and series approximation

Taylor Series

Estimating Pi

Numerical Approximation of Solutions of Differential Equations

Euler polygons

Grade

One exam   30%

Homework 70% (weekly)