MATH 5510
Numerical Analysis and Approximation Theory I
Fall 2019
Syllabus

Instructor

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MONT 328

Venue and Time

MONT 113, TuTh 2:00-3:15 pm.

Office hours

Tuesday, Thursday 11:00-12:00 pm or by appointment

Prerequisites

This course is appropriate for graduate students majoring in mathematics as well as mathematically inclined graduate engineering students. I will try to make the course self contained. Familiarity with basic analysis and basic knowledge of MATLAB is required. The course will cover the following topics:

Interpolation and Approximation:

- Polynomial interpolation.
- Trigonometric interpolation.
- Cubic and spline interpolation.
- Tschebyscheff polynomials.

Numerical Integration:

- Newton Cotes Rules.
- Peano error estimates.
- Gaussian quadrature.

Linear System of Equations:

- LU factorization.
- Round off error analysis.

Least Square Problems.

Textbook

Introduction to Numerical Analysis, by Stoer and Bulirsch

Grading policy

- Homework 70%
- Final Project 30%

Homework

There will be weekly homework assignments. There will be some problems that will require Matlab coding. Collaboration with classmates is encouraged. However, everyone must write and turn in their homework solutions separately.