

## Math 160S: Mathematical Numerical Analysis

TTh 10:05am – 11:20am, Room 205, Physics Building

<http://www.math.duke.edu/~alayton/math160S/>

[Numerical analysis is the study of] roundoff and function evaluation. — Richard W. Hamming, *Introduction to Applied Numerical Analysis*, 1971.

Numerical analysis is the study of algorithms for the problems of continuous mathematics. — L. Nick Trefethen, “The Definition of Numerical Analysis,” *SIAM News*, 1993.

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This course will develop the theoretical basis and computational techniques for:

- numerical differentiation and integration
- finding roots of nonlinear functions
- numerical linear algebra

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**Instructor:** Anita Layton

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**Office Hours** (tentative): Tues 11:30–12:30, Weds 2–3

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**Textbooks:**

*Numerical Analysis*, 8th edition, by Richard Burden and Douglas Faires

**Homework:** Problem sets including analysis and computing will be assigned on approximately a weekly basis. All homework should be typed, preferably using  $\LaTeX$ . Non-excused late assignments will be penalized.

You are encouraged to discuss the homework problems with each other, but your final submission (written hard-copies and electronically submitted codes) must be entirely your own independent work. The Duke Community Standard will be assumed in full effect throughout this course.

**Grading:** 50% homework problems; 30% two tests; 15% project; 5% participation.

This being a seminar course, attendance is *required*. Non-excused absences will negatively impact your grade in a serious way.

**Computing Environment:**

*Programming languages:* matlab

*Plotting programs:* gnuplot, xmgrace, matlab