

INTRODUCTION TO NUMERICAL METHODS I

MATH 5485, 4 credits, Fall 2013

Time, and place: MWF 1:25–2:15pm, VinH 113

Instructor: *Alexander (Alex) Shapeev*

Office hours: M 3:35–4:25, Tu 11:15–12:05, F 2:30–3:20, or by appointment.

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Course:

Overview: The course will cover numerical methods for the following problems: root finding, solving linear systems (and inverting matrices), finding eigenvalues/eigenvectors of matrices, and interpolation. An emphasis will be on studying algorithms and their convergence properties (such as order of convergence, number of iterations, etc).

The students are expected to learn programming in [Matlab](#). A part of the homework will be to implement and experiment with different algorithms in Matlab. In addition, the students will be given a *course project* to be programmed in Matlab. The instructor will conduct one 50-minute session in a computer lab introducing Matlab.

Course website: www.shapeev.com/teaching/MATH5485

Textbook: B. Bradie, *A Friendly Introduction To Numerical Analysis*, Pearson Prentice Hall, 2006.

The course will cover chapters 1–5 of the book. The same book is likely to be used for MATH 5486 in the spring semester.

Prerequisites:

- MATH 2243 or 2373 or 2573. I will assume basic knowledge of *linear algebra* (vectors, matrices, eigenvalues/eigenvectors) and *calculus* (limits, continuity, differentiation, integration, functions of many variables).
- Knowledge of, and some experience with, Matlab or any other programming language. (You should be able to formulate and implement algorithms like computing a sum of given N numbers.)

Required for: MATH 5486 “Introduction To Numerical Methods II”

Your Grade:

Assignments and Assessment: 10 weekly quizzes, 1 course project, 1 midterm exam, and 1 final exam. Some quizzes will be in-class, while the other will be take-home.

Final grade calculation. Your final grade will be assigned based on the following weighted average of your points:

Percentage	Assessment type
3%	class participation
17%	best 8 of 10 quizzes
20%	1 course project
20%	1 midterm exam
40%	1 final exam

Important dates:

Project (take home) due Oct 23 2:10pm
Midterm (in class) Nov 13 1:25–2:10pm
Final Exam (in class) Dec 16 1:30–3:30pm

Quizzes are held on all Wednesdays except for Sep 4 and 11 (first and second Wednesday), Oct 23 (project due), Nov 13 (midterm), Dec 11 (last day).

Use of calculators and written materials: You may only use personal calculators or graphic calculators during in-class tests. Mobile phones, computers, or any similar devices are not allowed during in-class tests (i.e., devices that connect to a network, store electronic documents, etc., are not allowed). Written materials other than those given or authorized by the instructor are also not allowed.

Make-up exam policy: There will be no make-up quizzes or exams under normal circumstances. Under exceptional, documented circumstances certain arrangements can be made to compensate for the missed exams; in this case the student should notify and discuss this with the instructor.

Academic Dishonesty: You are welcome to study and do the homework with your peers. However, you must work on the quizzes, projects, and exams on your own. Copying or getting assistance while working on quizzes, projects, or exams is an offence under the [Board of Regents Policy: Student Conduct Code](#).

Standard University Policies:

All university policies apply to this course. These policies include

- [student conduct code and scholastic dishonesty](#) (see also related [FAQ](#)),
- [student responsibilities](#) (including use of personal electronic devices in the classroom, appropriate student use of class notes and course materials)
- [makeup work for legitimate absences](#),
- [grading and transcripts](#),
- [sexual harassment](#),
- [equity, diversity, equal opportunity, and affirmative action](#),
- [disability accommodations](#),
- [mental health and stress management](#), and
- [academic freedom and responsibility](#).