Numerical Linear Algebra
CSC 352/652 and MTH 326/626
Course Syllabus

Fall 2016

Professor: Dr. Grey Ballard
Email: ballard@wfu.edu
Office: Manchester 234
Office Hours: 9-10 W and 10-11 Th, or by drop-in or appointment
Class: 11–12 MWF, Manchester 229
Text: *Numerical Linear Algebra* by Trefethen and Bau (SIAM 1997); see
`https://people.maths.ox.ac.uk/trefethen/text.html`

1   Course Description

Numerical methods for solving matrix and related problems in science and engineering. Topics will include systems of linear equations, least squares methods, and eigenvalue and singular value computations.

2   Learning Outcomes

By the end of this course, students should be able to:

1. write scripts and functions in Matlab,

2. use Matlab built-in functions to solve standard matrix problems,

3. identify where matrix computations arise in scientific applications,

4. reason about the accuracy and stability of numerical algorithms,

5. evaluate the efficiency of numerical algorithms, and

6. identify efficient software (LAPACK subroutines) for solving standard matrix problems.

This class is both a math and computer science class; thus, there will be both proofs as well as programming in Matlab. Familiarity with elementary linear algebra and Matlab is helpful but not required for this course. The graduate version of this class will be more demanding than the undergraduate version, and it will include a project.

3   Problem Sets, Exams, and Projects

There will be bi-weekly problem sets, a midterm, a final exam, and a project. The project is optional for undergraduates and required for graduate students.

Problem sets can be done collaboratively, but all code and proofs must be written by each individual. This means you can discuss problems with classmates, but you may not copy classmates' work or share code. Include the names of those with whom you've worked on each completed problem set.

The midterm and final exam are to be done individually. Projects can be done individually or with partners.

4   Assessment and Grading

Course grades are determined using the following weightings. Undergraduates who choose to do a project can use the better of the two weightings.
No project:

- 30% problem sets
- 30% midterm
- 40% final

With project:

- 30% problem sets
- 20% midterm
- 30% final
- 20% project

Letter grades are assigned based on the following categorization:

A	92 or above
A$^-$	90–91.99
B$^+$	88–89.99
B	82–87.99
B$^-$	80–81.99
C$^+$	78–79.99
C	72–77.99
C$^-$	70–71.99
D$^+$	68–69.99
D	62–67.99
D$^-$	60–61.99
F	below 60

5 Contacting Me

In general, email is the best way to reach me, and I'm happy to take questions over email. The easiest way to find me in person is to stop by my office during office hours, though please feel free to drop by any time. If you want to be sure to find me then you can also email ahead to schedule a time; it helps to propose a few times that work for you so that I can choose one that works for me too.

6 Other Comments

Please contact me as soon as possible if you know you will miss class due to a university-sponsored activity, such as athletics. If you have a disability that may require an accommodation for taking this course, then please contact the Learning Assistance Center (758-5929) within the first two weeks of the semester and bring it to my attention as appropriate.

7 Emergency Preparedness Policy

In the unlikely event of a major disruption of normal university activities (such as might result from a health emergency or other disaster), a course continuation contingency plan will be enacted in order to allow completion of the course. During this time, students should continue with the reading and other assignments listed on the syllabus and monitor email, Sakai, and the WFU website for information. If students have questions or are in doubt about how to proceed, they should contact the instructor by email if available, otherwise they should contact by phone. Carrier pigeon and Pony Express services have been discontinued.