

## SYLLABUS

Math 625/CSI 740, Spring 2014  
Numerical Linear Algebra

<b>Time:</b>	R 7:20 - 10:00 PM
<b>Place:</b>	Exploratory Hall, Room 4106
<b>Instructor:</b>	Walter Morris
<b>Office:</b>	Exploratory Hall, Room 4207
<b>Phone:</b>	703-993-1481
<b>Office Hours:</b>	R 2-4:15 and by appointment
<b>e-mail:</b>	wmorris@gmu.edu

The text we use is **Numerical Linear Algebra** by Trefethen and Bau, published by SIAM. I will assume that everyone knows the material of a basic Linear Algebra course such as Math 203. A more advanced Linear Algebra course such as Math 322 is beneficial, but not a prerequisite. I will also assume that everyone has had some computer programming experience.

There will be tests on February 20 and April 3. Each of these tests determines 25% of your grade. The final exam is at 7:30 PM on Thursday, May 8, and makes up 35% of your grade. No calculators may be used for the tests.

There will be weekly homework that is worth 15% of the grade.

Spring Break is the week of March 9-15.

The web page for the class is <http://math.gmu.edu/~wmorris/625hws14.html> On this page, you will find links to homework assignments and class notes.

Some of the homework will involve the computer program Matlab. You can either buy the software for your computer or use it in the university's computing labs or the virtual computer lab. Here is the Math department's website to help you with Matlab: <http://math.gmu.edu/introtomatlab.htm>

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS.

Please feel free to ask me questions in class and in office hours. You may also e-mail me questions or discuss the course over the telephone.

Here is a tentative schedule for the semester:

Jan. 23 Lectures 2, 3: Norms and Orthogonality

Jan. 30 Lectures 4, 5: Singular Value Decomposition

Feb. 6 Lectures 6, 7, 8: QR Factorization and Gram Schmidt

Feb. 13 Lectures 9, 10: Matlab and Householder Triangularization.

Feb. 20 Exam I and Lecture 11: Least Squares Problems

Feb. 27 Lectures 12, 13, 14: Conditioning, Stability

March 6 Lectures 15, 16, 17: Stability of Householder Triangularization and Back Substitution

March 13 SPRING BREAK

March 20 Lectures 18, 19, 20: Least Squares Problems, Gaussian Elimination

March 27 Lectures 21, 22, 23: Systems of Equations

April 3 Exam II and Lectures 24, 25: Eigenvalue Problems

April 10 Lectures 26, 27, 28: First Eigenvalue Algorithms

April 17 Lectures 29, 30, 31: More Eigenvalue and SVD Algorithms

April 24 Lectures 32, 33, 34: Arnoldi Iteration

May 1 Lecture 36: Lanczos Iteration and review