THE GEORGE WASHINGTON UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

ECE 219-10
COMPUTATIONAL TECHNIQUES IN ELECTRICAL ENGINEERING
Fall 2005

Faculty responsible: ***Martha Pardavi-Horvath***
Professor of Engineering and Applied Science

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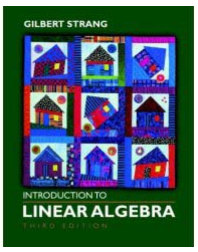
Classes: **Thursday, *7:*10 - 9:40 pm,** PHIL 111
Office hours: Thursday, 4:00 - 5:00 pm,
any other time by e-mail appointment only

Textbook:



Gilbert Strang: ***Introduction to Linear Algebra***, 3rd edition
Wellesley-Cambridge Press, 2003

Preferred language: MATLAB

Resources

Books:

1. 

Mastering MATLAB 7 -- by Duane C. Hanselman, Bruce L. Littlefield; Paperback (

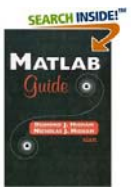
2. 

Introduction to MATLAB 7 for Engineers -- by William J Palm III, William Palm; Paperback

3. 

Getting Started With MATLAB: Version 6 : A Quick Introduction for Scientists and Engineers -- by Rudra Pratap; Paperback

- Higham: MATLAB Guide, SIAM



- Shampine, Allen and Pruess: FUNDAMENTALS OF NUMERICAL COMPUTING, Wiley
- Hammerlin - Hoffmann: NUMERICAL MATHEMATICS, Springer
- W. J. Palm III: MATLAB for Engineering Applications, WCB-McGraw-Hill, 1999.
- G. J. Borse: Numerical Methods with MATLAB, PWS, 1997.

- *AND MANY OTHERS.....*

Available software:

- MATLAB - licensed to SEAS and GWU
- MATLAB Student Edition http://www.mathworks.com/, Linear Algebra Toolbox
- MATLAB reference: great HELP inside MATLAB
- http://mathworld.wolfram.com/LinearAlgebra.html
- ***GAMS*** (Guide to Available Mathematical Software) of NIST: *http://gams.nist.gov*
- Mathematics Archives at: http://archives.math.utk.edu:80/

All course related information (homeworks, projects, announcements, etc) are found at

https://blackboard.gwu.edu/

Grading: **30 % Homework (absolutely no late submission is accepted)**
30 % Midterm
40 % Final exam

***Cheating*: not tolerated**
All involved receive a failing grade.

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Course outline

1.	Sep. 1	Scientific computation. MATLAB. Vectors and matrices.
2.	Sep. 8	System of linear equations - matrix notation.
	SEP. 15	**No CLASS – make up Dec. 10 Saturday**
3.	Sep. 22	Solution of system of linear equations - matrix operations
4.	Sep. 29	Complete solution. Vector spaces and subspaces.
5.	Oct. 6	Orthogonality. Least squares. Numerical methods: curve fitting.
6.	Oct. 13	Numerical methods: integration, differentiation, solution of differential equations.
7.	**Oct. 20**	**MIDTERM ☺**
8.	Oct. 27	Determinants.
9.	Nov. 3	Eigenvalues and eigenvectors.
10.	Nov. 10	Symmetry and similarity. Singular value decomposition. Pseudoinverse.
11.	Nov. 17	Scientific computation: norms and condition numbers.
	Nov. 24	**Happy Thanksgiving!**
12.	Dec. 1	Graphs and networks. Fast Fourier Transform. Scientific computing: Iterative methods.
13	Dec. 8	Scientific computing: Finite elements (FEM), Finite Differences (FDM).
14.	**Dec. 10**	Nonlinear equations and optimization. ***(Make-up day!)***
15	**DEC. 15**	**FINAL EXAM ☺**

...if weather permits

see GWU Academic calendar for Fall 2005 on the next page

Further info: mpardavi@gwu.edu

FALL SEMESTER 2005		
CLASSES BEGIN	**(W) August 31**	M=14
No classes (Labor Day weekend)	(S) September 3	T=14
Labor Day (holiday)	(M) September 5	W=14
Thanksgiving Break	(**R**-F) **November 24**-25	R=14
Designated Monday	**(W) December 7**	F=14
Last day of Fall semester classes Saturday classes from Sept. 3 **Make-up Classes**	**(Sat) December 10**	
Reading Day	(M) December 12	
FINAL EXAMINATIONS	**(T-W) December 13-21**	