UNIVERSITY of GUELPH

SCHOOL OF ENGINEERING

ENGG*1500: ENGINEERING ANALYSIS
COURSE OUTLINE - WINTER 2007

COURSE DESCRIPTION

Engineering application of matrix algebra, vector spaces and computer techniques to solve linear systems. Linear transformations. Eigenvalues and eigenvectors. Diagonalization. Complex eigenvalues and eigenvectors.

INSTRUCTOR

Dr. Dalia. Fayek
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TEACHING ASSISTANTS

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CO-REQUISITES

ENGG*1210 Engineering Mechanics I
MATH*1210 Calculus II

COURSE SCHEDULE

LECTURES:		Tuesday	11:30 am – 12:50 pm	MAC 149
		Thursday	11:30 am – 12:50 pm	MAC 149
TUTORIALS:	1	Monday	12:30 – 1:20 pm	MACK 307 (*)
	4	Tuesday	8:30 – 9:20 am	MACK 307 (*)
	2	Wednesday	2:30 – 3:20 pm	MACK 307 (*)
	5	Thursday	8:30 – 9:20 am	MACK 307 (*)
Final exam		Tue, April 10, 2006	7:00 pm – 9:00 pm	TBA

(*) Please refer to "Method of Presentation" Section.

TEXT

Linear Algebra and Its Applications, 3rd Edition, David C. Lay

COURSE OBJECTIVES

Students who successfully complete this course will be able to:

- describe selected engineering systems in terms of vector and matrix models
- carry out the fundamental operations of vector, matrix and complex variable arithmetic
- solve simultaneous equations, representing engineering systems, by matrix methods
- use computer techniques to solve some engineering problems

COMMUNICATION

Principal method of communication between instructor, teaching assistants and students is through the email-list engg150@listserv.uoguelph.ca. It's the student's responsibility to ensure that he/she is on the mailing list.
WebCT is the course web site. All course material will be posted there.
Office hours will be offered by the instructor and teaching assistants. Schedule of office hours is posted on WebCT.

MATERIAL TO BE COVERED

Engineering Analysis is a core course for all students in Engineering. It covers the uses of vector and matrix techniques used to solve engineering problems. Emphasis is placed on engineering applications and current computer techniques using MATLAB.

Linear systems and their applications	2 – 2.5 weeks
Matrix operations, determinants and square matrix inverse	1 – 1.5 week
Vector spaces and Orthogonality	2 – 2.5 weeks
Eigenvalues and Eigenvectors	1.5 – 2 week
Complex Eigenvalues and Linear transformations	1 - 1.5 week
Diagonalization and Quadratic forms	1.5 week

Possible additional topics to be covered:

Least Squares	0.5 week
Constrained Linear Optimization	0.5 week
Singular Value Decomposition	0.5 week

METHOD OF EVALUATION

The final grading will be determined according to the following scheme:

Quizzes	30%
Programming Assignments	20%
Final Exam	50%

METHOD OF PRESENTATION

- The material listed above will be presented in 2 lectures per week.
- On alternating weeks, regular one-hour tutorial periods will include problem sets compatible with the lecture material to enhance understanding of the subject matter. These tutorials will be in MACK 307.
- MATLAB training sessions will be conducted during tutorial times in THRN 2313 as outlined in the course calendar on WebCT → Information → Course Calendar.
- Four in-class quizzes will be written according to the schedule indicated on the course calendar on WebCT. The best three out of the four quizzes will have the 30% weight in the course evaluation.
- Two programming assignments using MATLAB are required to complete the course requirements. Please refer to WebCT → Information → Course Calendar for the assignments submission deadlines.

QUIZ SCHEDULE

Quiz (1)	Quiz (2)	Quiz (3)	Quiz (4)
Thu --- January 25	Tue --- February 13	Thu --- March 8	Tue --- March 27

NOTES

- Programmable functions are not to be used for the quizzes nor final examination.
- Late programming assignments will be penalized 25% of the assignment total mark. The mark of assignments submitted after 24 hours of the due date/time is zero.
- Requests for academic consideration because of illness or of a compassionate nature must be made in writing and accompanied by appropriate certification where required.
- Requests for academic consideration based on religious grounds must be made known to the instructor during the first two weeks of classes, i.e., no later than Jan 19th, 2007.
- There will be no make-up for any missed quiz.
- Any act of academic misconduct will be reported. Please refer to the University of Guelph policies on Academic Misconduct: Section VIII - Undergraduate Degree Regulations and Procedures.