UNIVERSITY OF GUELPH
SCHOOL OF ENGINEERING

ENGG*1500: ENGINEERING ANALYSIS
COURSE OUTLINE - WINTER 2004

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

INSTRUCTORS

Prof. **Dalia Fayek**	Prof. **John Runciman**
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TEACHING ASSISTANTS

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COMMUNICATION
- Principal method of communication between instructors, TAs and students is through the email-list **engg150@listserv.uoguelph.ca**. Subscription to this mailing list is **mandatory**!
- Office hours will be offered by the instructors and teaching assistants. Schedule of office hours will be announced in the second week of classes.

CO-REQUISITES
1. ENGG*1210 Engineering Mechanics I
2. MATH*1210 Calculus II

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

METHOD OF PRESENTATION
- The material listed above will be presented in 2 lectures per week.
- Weekly 1-hour tutorial periods will include problems compatible with the lecture material to enhance understanding of the subject matter.

COURSE OBJECTIVES

Students who successfully complete this course will be able to:

a) describe selected engineering systems in terms of vector and matrix models
b) carry out the fundamental operations of vector, matrix and complex variable arithmetic
c) solve simultaneous equations, representing engineering systems, by matrix methods
d) use computer techniques to solve the types of problems itemized in b) and c)

COURSE SCHEDULE

LECTURES:	Sec 0101 to	Tuesday	4:00 – 5:20 pm	AXEL 100
	Sec 0105	Thursday	4:00 – 5:20 pm	AXEL 100
	Sec 0206 to	Tuesday	4:00 – 5:20 pm	MAC 149
	Sec 0210	Thursday	4:00 – 5:20 pm	MAC 149
TUTORIALS:	1500*0101	Thursday	01:30 – 02:20 pm	MACK 308
	1500*0102	Thursday	11:30 – 12:20 pm	MACK 228
	1500*0103	Thursday	12:30 – 01:20 pm	MACK 307
	1500*0104	Tuesday	01:30 – 02:20 pm	MACK 304
	1500*0105	Friday	01:30 – 02:20 pm	MACK 308
	1500*0206	Tuesday	11:30 – 12:20 pm	MACK 307
	1500*0207	Tuesday	12:30 – 01:20 pm	MACK 304
	1500*0208	Monday	03:30 – 04:20 pm	MACK 304
	1500*0209	Monday	01:30 – 02:20 pm	MACK 304
	1500*0210	Friday	10:30 – 11:20 am	MACK 230

COURSE WORK

QUIZ 1	Week #03: Jan 19 – Jan 23	THRN 2313	
QUIZ 2	Week #05: Feb 02 – Feb 06	THRN 2313	
MIDTERM	**Thursday, Feb 12, 2004**	**4:00 – 5:20 pm**	AXEL 100/MAC 149
WINTER BREAK	Feb 16 – Feb 20, 2004		
QUIZ 3	Week #09: Mar 08 – Mar 12	THRN 2313	
QUIZ 4	Week #11: Mar 22 – Mar 26	THRN 2313	
FINAL EXAM	**Friday, Apr 16, 2004**	**8:30 – 10:30 am**	TBA

MATERIAL TO BE COVERED

This course is a core subject for all students in Engineering. It covers the uses of vector and matrix techniques for the solution of engineering problems. Emphasis is placed on engineering applications and current computer techniques using the MATLAB software package.

Linear systems and their applications

Matrix operations and determinants

Vector spaces

Eigenvalues, Eigenvectors and Eigenspaces

Complex Eigenvalues and Linear transformations
Orthogonality and Least Squares
Diagonalization and Quadratic forms (optional)

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

Midterm examination	45%
Final examination	45%
Quizzes	10%

- The four quizzes will be conducted during the respective tutorial time in the Thornbrough building (THRN) room 2313, at the beginning of the tutorial time in the prescribed weeks outlined above.
- The quiz duration will be announced in advance.
- The quizzes will be performed using the WebCT online quizzing system.
- Each student must (electronically) write the quiz in his/her respective tutorial time-slot.

NOTES

1. The midterm examination will cover material taken in lectures from Jan 6^{th} to Feb 10^{th} .
2. The final examination will cover material taken in lectures from Feb 24^{th} to Apr 1^{st}
3. Programmable calculators are **not** to be used for the midterm or final examination.
4. Requests for academic consideration because of illness or of a compassionate nature must be made in writing and accompanied by appropriate certification where required.
5. Requests for academic consideration based on religious grounds must be made known to the instructors during the first two weeks of classes, i.e., no later than Jan 16^{th}, 2004.
6. Any act of academic misconduct will be reported. Please refer to the University of Guelph policies on Academic Misconduct (Undergraduate calendar, pages 30-32).
7. There will be no make-up for the midterm. If a student misses the midterm (see Note 5), the weight of the midterm will be prorated and added to the weight of the final examination as part of the overall evaluation for this course.
8. At most **one** quiz make-up will be done during the week of March 22^{nd} to March 26^{th}. Quiz time to be arranged in the week of March 15^{th}.