ENGG*1500 Engineering Analysis
Winter 2014

School of Engineering

(Revision 0: January 6, 2014)

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1 INSTRUCTIONAL SUPPORT

1.1 Instructors

Instructor	Office	e-mail	Office hours
Soha Eid Moussa, Ph. D., P. Eng.	THRN 1341	smoussa@uoguelph.ca	Open door policy and by appointment
Jonathan VanderSteen, Ph. D., P. Eng	THRN 2333	vandersj@uoguelph.ca	Mon 4:30-6:30 or by appointment

1.2 Lab Technician

Technician: NA

1.3 Teaching Assistants

GTA	**Email**	**Office Hours**
Oana Burlacu	oburlacu@uoguelph.ca	MWF 1:30-2:30 THRN 1427
Adam Moore	amoore03@uoguelph.ca	MWF 1:30-2:30 THRN 1427
Paul Dimaria	pdimaria@uoguelph.ca	MWF 1:30-2:30 THRN 1427
Heli Xu	heli@uoguelph.ca	MWF 1:30-2:30 THRN 1427
Kelly Baah	kbaah@uoguelph.ca	MWF 1:30-2:30 THRN 1427
Harspreet Nanda	hnanda@uoguelph.ca	MWF 1:30-2:30 THRN 1427
Xiaoyan Chen	xchen03@uoguelph.ca	MWF 1:30-2:30 THRN 1427
Nishima Mehindru	nmehindr@uoguelph.ca	MWF 1:30-2:30 THRN 1427

2 LEARNING RESOURCES

2.1 Course Website

Course material, news, and announcements will be regularly posted to the ENGG*1500 Courselink site. You are responsible for checking the site regularly.

2.2 Required Resources

1. Daniel Norman and Dan Wolczuk, Introduction to Linear Algebra for Science and Engineering, Second Edition, Pearson Canada Inc., 2012.

   An electronic version of this book may be rented/accessed at the following web site: http://www.coursesmart.com/IR/4030454/9780321750051?__hdv=6.8

   A copy of this book is also on reserve in the library.

2.3 Recommended Resources

1. Clickers: clickers will occasionally be used to verify understanding and encourage class participation, please bring your clicker to class regularly

2.4 Additional Resources

Lecture Information: All the lecture notes will be posted on the web page (week #1-#12).

Lab Information: NA

Assignments: Download the assignments, all the solutions will be posted.

Miscellaneous Information: Other information may also be posted on the web page.

2.5 Communication & Email Policy

Please use lectures and lab help sessions as your main opportunity to ask questions about the course. Major announcements will be posted to the course website. **It is your responsibility to check the course website regularly.** As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

3 ASSESSMENT

Calculators are NOT PERMITTED during assessments.

3.1 Dates and Distribution

Test 1: Tues Jan. 28, 8:30, duration 60 minutes, In class

Test 2: Thurs Feb 27, 8:30, duration 60 minutes, In class

Test 3: Thurs March 27, 8:30, duration 60 minutes, In class

Final Exam: Mon April 7, 2:30 – 4:30, Room TBA on Webadvisor

Marking Scheme 1: Best 2 out of 3 tests worth 25% each, final exam worth 50%

Marking Scheme 2: Each midterm worth 20%, final exam worth 40%

The marking scheme which is to the advantage of the student is the one that will be used.

Disclaimer: *The instructor reserves the right to change any of the above mid-term dates in the event of appropriate circumstances, subject to University of Guelph Academic Regulations*

3.2 Course Grading Policies

Missed Assessments: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please email the course instructor. See the undergraduate calendar for information on regulations and procedures for Academic Consideration: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

Passing grade: In order to pass the course, you must obtain a grade of 50% or higher in the course.

Missed midterm tests: If you miss a test due to grounds for granting academic consideration or religious accommodation, the weight of the missed test will be added to the final exam. There will be no makeup midterm tests.

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4 AIMS, OBJECTIVES & GRADUATE ATTRIBUTES

4.1 Calendar Description

This course deals with engineering applications of matrix algebra, vector spaces and computer techniques to solve linear systems. Topics include linear transformations, eigenvalues and eigenvectors, diagonalization and their applications. Additional topics include complex variable algebra, multi-variable functions, partial derivatives, maxima and minima.

Prerequisite(s): **MATH*1200** - Calculus

4.2 Course Aims

The main goal of this course is to give you a solid foundation in the basic concepts of linear algebra that will be needed throughout your engineering career.

4.3 Learning Objectives

At the successful completion of this course, the student will have demonstrated the ability to:

1. Describe and evaluate the properties of vectors and basic vector spaces and subspaces.
2. Set up, manipulate, and solve systems of linear equations for a variety of engineering applications.
3. Describe and evaluate the properties of matrices including inverse matrices, identity matrices, and transpose matrices.
4. Calculate, comprehend, and apply determinants and their applications.
5. Calculate, comprehend, and apply eigenvalues and eigenvectors and their applications.
6. Problem solve with academic integrity; preparing for a professional career with honesty and ethics at the forefront of engineering analysis.

4.4 Graduate Attributes

Successfully completing this course will contribute to the following CEAB Graduate Attributes:

Graduate Attribute	Learning Objectives	Assessment
1. Knowledge Base for Engineering	1, 2, 3 4, 5	Tests, Exam
2. Problem Analysis	-	-
3. Investigation	-	-
4. Design	-	-
5. Use of Engineering Tools	-	-
6. Communication	-	-
7. Individual and Teamwork	-	-
8. Professionalism	-	-
9. Impact of Engineering on Society and the Environment	-	-
10. Ethics and Equity	6	-
11. Environment, Society, Business, & Project Management	-	-
12. Life-Long Learning	6	-

4.5 Instructor's Role and Responsibility to Students

The instructor's role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected lecture notes will be made available to students on Courselink/D2L but these are not intended to be stand-alone course notes. During lectures, the instructor will expand and explain the

content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for tests and project.

4.6 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures and tutorials. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who do (or may) fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

4.7 Relationships with other Courses & Labs

Previous Courses:

MATH*1200: Calculus

Following Courses:

ENGG*2160: Engineering Mechanics II – solving linear systems that appear in problems involving deformable solids

ENGG*2400: Engineering Systems Analysis – many applications of linear algebra through modelling engineering systems such as mechanical, electrical, thermal, biological, and environmental systems

ENGG*4460: Robotic Systems – solving kinematic equations for robotic systems

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5 TEACHING AND LEARNING ACTIVITIES

5.1 Timetable

Lectures:

Tuesday		8:30-9:50	ROZH 101
Thursday		8:30-9:50	ROZH 101
Tutorials:			
Monday	0109	10:30-11:20	MACK 305
Monday	0106	11:30-12:20	MACK 316
Monday	0102	1:30 – 2:20	MACK 315
Tuesday	0101	11:30-12:20	MACK 315
Wednesday	0104	8:30-9:20	MACK 306
Wednesday	0108	8:30-9:20	MACK 307
Wednesday	0110	9:30-10:20	MACK 314
Wednesday	0112	10:30-11:20	MACK 315
Thursday	0111	11:30-12:20	MACK 304
Friday	0105	10:30-11:20	MACK 308
Friday	0107	1:30-2:20	MACK 311

5.2 Lecture Schedule: *The proposed schedule of topics is shown below.*

Topic	Learning Objectives
Euclidean Vector Spaces	1
Systems of Linear Equations	2
Matrices, Linear Mappings, and Inverses	3
Vector Spaces	1
Determinants	4
Eigenvectors and Diagonalization	5
Orthonormal Bases	1
Symmetric Matrices and Quadratic Forms	3
Eigenvectors in Complex Vector Spaces (time permitting)	-
MATLAB (time permitting)	-

5.3 Design Lab Schedule

NA

5.4 Lab Schedule

NA

5.5 Other Important Dates

Monday, January 6 2014: First day of class
Monday, February 17 – Friday, February 21 2014: Winter Break
Friday, March 7: drop date – 40th class
Friday, April 4 2014: last day of class

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6 LAB SAFETY

Safety is critically important to the School and is the responsibility of all members of the School: faculty, staff and students. As a student in a lab course you are responsible for taking all reasonable safety precautions and following the lab safety rules specific to the lab you are working in. In addition, you are responsible for reporting all safety issues to the laboratory supervisor, GTA or faculty responsible.

If the laboratory rules are not followed, consequences will include removing student's access to the lab. If this results in lab work not being completed, the student will receive a grade of 0.

7 ACADEMIC MISCONDUCT

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

7.1 Resources

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:
http://www.academicintegrity.uoguelph.ca/

Please also review the section on Academic Misconduct in your Engineering Program Guide.

The School of Engineering has adopted a Code of Ethics that can be found at:
http://www.uoguelph.ca/engineering/undergrad-counselling-ethics

8 ACCESSIBILITY

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability for a short-term disability should contact the Centre for Students with Disabilities as soon as possible

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: http://www.uoguelph.ca/csd/

9 RECORDING OF MATERIALS

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

10 RESOURCES

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: http://www.uoguelph.ca/registrar/calendars/index.cfm?index