MATH*2160 Syllabus Page (Fall 2015)

Class: T/Th, 11:30am-12:50pm, ROZH 103
Instructor: Marcus Garvie
Office: MACN 552
Email: mgarvie@uoguelph.ca
Office Hours: Tue 10-11am, Tue 2-5pm
Prerequisites: MATH*1200 or IPS*1500
Credit Weight: 0.50
Campus: main
Semester Offering: Fall
Teaching Assistants: George Hutchinson (ghutch02@uoguelph.ca) MACN 527; Ram Prasad Sigdel (rsigdel@uoguelph.ca) MACN 527.

Course Notes:

Entire set of condensed class notes (125 pages - 2 slides to a page):
http://www.uoguelph.ca/~mgarvie/Teaching/Student_Slides_2160_2015.pdf

Application Examples: (uploaded when available)

The application examples discussed in class can be found here:
http://www.uoguelph.ca/~mgarvie/Teaching/Applications2160/Applications.html

Discovery Segments: (made available in class as we do them)

Class Problems: (made available in class as we do them)

Course and Lecture Content:

This course provides an introduction to linear algebra in Euclidean space. Topics covered include: N-dimensional vectors, dot product, matrices and matrix operations, systems of linear equations and Gaussian elimination, linear independence, subspaces, basis and dimension, matrix inverse, matrix rank and determinant, eigenvalues, eigenvectors and diagonalization, orthogonalization and projections, linear transformations. Some fundamental proofs and applications of these topics will be included.

Specific Learning Outcomes:

As a minimum, students who pass the course will:

- Have a basic understanding of the algebra of matrices

- Understand how linear algebra is needed to work with systems of linear equations
- Be familiar with some applications of linear algebra
- Have a basic understanding of some theoretical linear algebra concepts, including proof
- Have gained some experience in using computer software to manipulate matrices

Tests and exam times:

Exams are based mainly on examples done in class and homework. A minor component (say, roughly 15%) will test MATLAB usage, applications, and basic proofs.

- 20% Midterm Exam: in class, scheduled for Tuesday, October 20, in class
- 20% Midterm Exam: in class, scheduled for Thursday, November 19, in class
- 60% Final Exam: Friday, December 18, 7 - 9 pm, Rm TBA

Tentative outlines for tests and final exam

- Outline for Test 1: Outline01.pdf
- Outline for Test 2: Outline02.pdf
- Outline for Final: Outline03.pdf

Solutions to last years midterms and final

- Test 1: Math*2160_test1_F14.pdf
- Test 1 solutions: Math*2160_test1_F14_solns.pdf
- Test 2: Math*2160_test2_F14.pdf
- Test 2 solutions: Math*2160_test2_F14_solns.pdf
- Final exam: Math*2160_final_F14.pdf
- Final exam solutions: Math*2160_final_F14_solns.pdf

Solutions to this years midterms (uploaded when available)

- Test 1: Math*2160_test1_F15.pdf
- Test 1 solutions: Math*2160_test1_F15_solns.pdf
- Test 2:

What to bring to class

- Blank paper, pens/pencils
- Condensed class notes (optional). See the link given above.
- Scientific calculator

Text:

- The following textbook is required: Bernard Kolman & David R. Hill: *Elementary Linear Algebra with Applications*, Pearson/Prentice Hall, 9th Edition, ISBN-13: 978-0-13-229654-0.
- Exact coverage for the tests, exams and homework will depend on our progress and will be announced in due course.
- Before you start the course (or soon thereafter) please read in the introduction: 'TO THE STUDENT', and 'How to Succeed in Linear Algebra'.

Attendance:

Formal attendance will not be taken. However, I *strongly* encourage you to attend class regularly. It is your responsibility to find out what was covered if you miss class.

Email Etiquette:

Although I try to respond to all email messages, please don't ask me math questions by email (come & see me instead - don't be shy!); ask for class notes; tell me that you are going to miss a lesson; or generally ask me a question that you can find out for yourself. Keep your messages to the point, polite, and clearly state your question, with name, student ID, and course details.

Homework:

- Homework questions are based on lectures and are available here: http://www.uoguelph.ca/~mgarvie/Teaching/Homework_2160_F15.pdf .
- Homework is not graded, but will be the basis for Midterms and Final Exam, so you are strongly encouraged to do (as a minimum) the assigned questions.
- You should attempt questions as soon as the appropriate sections have been covered in class.
- You may find it helpful to verify your hand written calculations using MATLAB (see below), or some other software package (e.g. MAPLE). This is particularly useful for the more lengthy and tedious calculations, for example, when applying row operations to a large matrix.

Exam policies:

- All exams are **closed book**. You may not use the textbook, crib sheets, notes, or any other outside material. Do not bring your own scratch paper.
- You are not allowed to use laptop computers/cell phones/graphing calculators in the exam. Ordinary scientific calculators are permitted.
- The Final Exam is cumulative, i.e., it covers the whole course material, although some 50% of material is on the topics that were not covered by the Midterms.

Academic consideration:

- There will be NO MAKE-UP MIDTERM EXAMS. If you miss a Midterm exam such as serious illness of yourself or death of your immediate family, please contact me by email ASAP explaining the reason for missing the test. You do NOT need to get a doctor's note. If consideration is granted I will re-ajust the weight of assessed material (**your grade will be calculated by simply adding up all points**

divided by the total possible number of points, expressed as a percentage). For further details concerning Academic Consideration see https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

- Athletes who compete away from the University of Guelph during one of the midterms can arrange for their coach to proctor their exam. Just get your coach to contact me and we will make the arrangements.
- If you miss the final exam due to catastrophic events such as serious illness of yourself or death of your immediate family, you will receive an "Incomplete" grade, then (depending on circumstance) you may be allowed to take a make-up exam to receive a letter grade.

Academic Misconduct

Academic misconduct is broadly understood to mean offences against the academic integrity of the learning environment. Academic misconduct is not tolerated. Please report any and all occurrences. For more details about the University of Guelph's dedication and commitment regarding academic integrity, review https://www.uoguelph.ca/registrar/calendars/undergraduate/2014-2015/c08/c08-amisconduct.shtml.

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 or 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/.

Course Policy regarding use of electronic devices and recording of lectures

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

Drop date

The last date to drop one-semester courses, without academic penalty, is November 6, 2015. For regulations and procedures for Dropping Courses, see the Academic Calendar: https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml.

MATLAB Access:

To use MATLAB there are a few options:

- MATLAB is available on the machines in the data resource centre of the Library (1st Floor).
- There are machines for individual use (providing a class isn't running) in the New Science block (SCIE 1303, 1305).

- Use your own account at your own department if your department has the MATLAB license.
- Buy a Student Version of MATLAB.
- Install *Octave* system on your own PC, which is free software and emulates MATLAB. Caution: Most likely you can do all the (numerical) homework exercises, but I have not tested all the exercises yet. Visit the official web site of Octave at http://www.octave.org. To download Octave 2.1.73 for Windows go to http://sourceforge.net/project/showfiles.php?group_id=2888.

MATLAB Tutorials:

For a particularly simple introduction I recommend you work through the following tutorial: http://www.uoguelph.ca/~mgarvie/Teaching/My_Matlab_tutorial.pdf. For a more comprehensive tutorial see: http://www.uoguelph.ca/~mgarvie/Teaching/primer.pdf. For additional details, the official MATLAB manual is available from http://www.mathworks.com/access/helpdesk/help/helpdesk.shtml. There are also numerous online MATLAB tutorials.

Please email me if you have any comments or questions!