

University of Western Ontario
Course Outline Applied Mathematics 2811b (formerly 213b)
Winter 2009, Linear Algebra II

Instructor: Greg Reid

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Course Web Site: <http://www.orcca.on.ca/~reid>

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It is your responsibility to regularly check the course web site for announcements, assignments, important dates etc (at least several times a week).

Lectures: M–W–F 12:30 – 1:30 pm, HSB 35 (first lecture on Monday Jan 5, 2009).

Text: *Applied Linear Algebra* by Peter J. Olver and Chehrzad Shakiban

Prentice Hall, 1st ed., 2005, ISBN-10: 0131473824

Authors' Web Page for Text: <http://www.math.umn.edu/~olver/ala.htm>

It's now available in the Book Store as a package (Text + Student Solutions Manual, both are required for the course).

Background: This course is a follow-up to a standard first university level course in linear algebra (e.g. Linear Algebra 040 at UWO). See the Calendar for the prerequisites which include at least 60% in Linear Algebra 040a/b or Applied Mathematics 025a/b and a full course in first year calculus. Topics in such a first course include: vectors, matrices and matrix algebra and applications, solution of linear equations in a general setting, determinants, vector spaces, orthogonality, eigenvectors and eigenvalues.

Contents of Course: Vector space examples, inner products, orthogonal sets including trigonometric functions, wavelets, projections, least squares, normal equations, Fourier approximations, eigenvalue problems, diagonalization, defective matrices. Coupled difference and differential equations; applications. Singular Value Decomposition, image approximations. Linear Transformations, Graphics. Applications to the sciences and other areas will be an integral part of the course.

Computer methods will be used throughout the course. Prior knowledge of programming is not required, although the student should have had some experience with using a computer package (e.g. Maple, Matlab or Mathematica). Students are expected to develop their ability to write solutions and this will be a component of assessment (i.e. English description, rather than just formulae).

Evaluation:

Assignments & Quiz(25%), **1 Midterm**(25%), **Final Exam**(50%).

Graded assignments and quizzes will all be equally weighted. There will be no make-ups on missed quizzes or assignments. However, you will be able to drop your lowest two scores (e.g. if these were an assignment, and a quiz score then you would drop those two). Bonus problems in hand-in assignments will be given (to a max of 3% on top of your total other assessment). Attention should be paid to material from lectures, text and web site, to gain a complete view of expectations for course. Over-reliance on one source is unwise. For example some material will be covered in the lectures that is not in the text, and in particular in a manner sometimes different to the text. Note also that the web site, does not contain a complete list of announcements. Note that one of the quizzes will be a computer lab quiz.

Unless otherwise announced, quizzes and hand in assignments will alternate on every Friday. They cover all material given in class (and also in the text) up to and including the previous Friday unless otherwise indicated. Assignment 1 is due on Friday Jan 16.

Plagiarism and Cheating: are serious offenses and should read the UWO policy on this matter, which we adopt: <http://www.orcca.on.ca/~reid/Courses/PlagiarismUWOPolicy.html>

See next page for further important info

Addendum to all Applied Mathematics Course Outlines

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your faculty's Dean's Office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from your faculty's Dean's Office immediately. For further information please see:

<http://www.uwo.ca/univsec/handbook/appeals/medical.pdf>

A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here:

https://studentservices.uwo.ca/secure/medical_document.pdf