

Math 152, Spring 2015

Course Web Page: www.math.ubc.ca/~wetton/

Text: There is no required textbook for this course. Instead, we will be following a set of lecture notes. They are available for downloading on the web page above. In the course, we will cover Chapters 1-6, except for the “additional topics” sections. An *optional* additional commercial textbook, “Introduction to Linear Algebra for Science and Engineering” by Norman and Wolczuk covers much of the material in the course.

Marks: 50% final, 2 midterms worth 15% each, labs worth 10%, homework worth 10%. **Note:** Midterms will be common for MWF sections with a different common test for TTh sections. Midterm marks may be scaled differently between these two groups to the average on the common final exam.

Midterm Dates: Thursday/Friday February 5/6, Wednesday/Thursday March 18/19

Assignments: There will be weekly online WebWork assignments, posted on Fridays and due the following Mondays (in 10 days) at midnight. There will be 11 assignments. The lowest assignment mark will be dropped from the average.

Labs: You are responsible for completing six one hour computer labs using the software, MATLAB. They will be held once every two weeks. There is no lab during the first week of classes. Lab material will be tested in tests and in the final exam.

Calculators: **NO** calculators are permitted on the final exam or tests.

Notes: **NO** notes are permitted on the final exam or tests.

Final Exam: There is a common exam for all sections of Math 152.

Course Outline

- week #1, January 5-9:** vectors and coordinate representation; vector length, dot product, projection. *Notes sections: 2.1, 2.2, 2.3*
- week #2, January 12-16:** determinants; cross product; lines and planes in 2D and 3D and planes in 3D. *2.3, 2.4, 2.5*
- week #3, January 19-23:** geometry of solutions of linear systems; linear dependence and independence; solving linear systems. *2.6, 3.1, 3.2*
- week #4, January 26-30:** solving linear systems (cont.); echelon form and rank; homogeneous equations. *3.2, 3.3, 3.4*
- week #5, February 2-6:** resistor networks; Test #1. *3.5*
- week #6, February 9-13:** (Family Day) resistor networks (cont.); matrix multiplication; linear transformations. *3.5, 4.1, 4.2*
- February 16-20 Reading Week**
- week #7, February 23-27:** rotations, projections and reflections in 2D; matrix representation and composition of linear transformations; random walks; transpose. *4.2, 4.3, 4.4*
- week #8, March 2-6:** matrix inverse; matrix representation of resistor network problems; determinants. *4.5, 4.6, 4.7*
- week #9, March 9-13:** determinants (cont.); complex numbers; complex linear systems; test #2. *4.7, 5.1, 5.2, 5.3*
- week #10, March 16-20:** eigenvalues and eigenvectors; Test #2. *6.1*
- week #11, March 23-27:** eigenvalues and eigenvectors (cont.); powers of a matrix; application of eigen-analysis to random walks. *6.1, 6.2*
- week #12, March 30-April 2:** application of vector DEs to electrical networks; vector differential equations (Good Friday) in. *6.3, 6.4*
- week #13, April 7-10:** (Easter Monday) review;