

**Math 152, Section 202**  
**Linear Systems**  
**Course Information**  
**The University of British Columbia**  
**Winter 2013**

**Instructor:** Jose Gonzalez  
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**Math 152 Website:** [http://www.math.ubc.ca/~oyilmaz/courses/m152/m152\\_common.html](http://www.math.ubc.ca/~oyilmaz/courses/m152/m152_common.html)  
**Section 202 Website:** <http://www.math.ubc.ca/~jgonza/teaching.html>  
**Text:** Online notes by UBC Professors R. Froese and B. Wetton available at the Math 152 Website. The book “Linear Algebra and Its Applications” by David C. Lay is an optional reference book.

### **Background and Goals:**

Many applied problems from Science, Engineering and Finance can be written in terms of Linear Algebra questions. This is also true of Calculus, which is why these two fields are stressed in undergraduate Mathematics education at UBC and other universities. The goal of the course is to enable students to

1. Recognize linear algebra questions (for which there are straight-forward analytic and numerical solution techniques) as parts of applied problems.
2. Make the connection between geometric properties and analytic quantities (determinants, dot and cross products, eigenvalues, etc.).
3. Recognize that linear systems of equations can have unique, infinite or no solutions and know how to determine all solutions or that none exist.
4. Recognize matrix multiplication as a linear transformation and that such transformations (to the same dimensional space) can be simplified using eigen-analysis.
5. Use complex numbers, which arise naturally in the eigen-analysis of matrices.

### **Content:**

The subject of the course is Linear Algebra, focusing on three main topics: vectors and matrices and connections to geometry, linear systems, and eigen-analysis of matrices. Several applications are considered including resistor networks and random walks.

### **Grading:**

Your final grade for the course is based on your scores on **three exams** (two Midterm Exams and a Final Exam), your scores on the **weekly online homework**, your scores on the **biweekly computer labs** and your scores on the **quizzes**. The corresponding percentages are as follows.

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|--|-----|
| • First Midterm Exam (February 7):                                   | 15% |
| • Second Midterm Exam (March 20):                                    | 15% |
| • Final Exam ( <b>Cumulative</b> , common to all Math 152 sections): | 45% |
| • Weekly Homework:   | 10% |
| • Biweekly Computer Labs:  | 10% |
| • Quizzes:   | 5%  |

**Note:** Grades on the two Section Midterms may or may not be adjusted according to the section’s average on the common final exam.

## Weekly Homework Assignments:

Online homework for the course will be provided via the WeBWorK system. The assignments will be posted at: [https://webwork.elearning.ubc.ca/webwork2/MATH\\_152\\_ALL\\_2012W2](https://webwork.elearning.ubc.ca/webwork2/MATH_152_ALL_2012W2) where you need to log in using your CWL. There will be one assignment posted per week, each due on the following Monday at 8:00 AM, with the first assignment due on Monday, January 14 at 8:00 AM. You may attempt each question many times without a penalty for a wrong answer up to a certain maximum specified for each problem. The questions are generated randomly, and the numbers are different for each student. Do the problems by yourself and without the use of other calculators or software (WeBWorK software itself acts as a basic calculator). There will be no deadline extension and no make-up for missed online homework assignments. All the information about the Online Homework can be found in the Math 152 Website.

## Biweekly Computer Lab Assignments:

The course includes six one-hour computer labs using the software, **MATLAB**. These are given to small groups of students every other week starting in the second week of the term. Locations and times for the lab sections can be found following a link from the course web page. The **biweekly computer labs** will count for 10% of your final grade. Note that lab material may be tested in the midterms and in the final exam. The website for the Labs is

<http://www.ugrad.math.ubc.ca/~math152/>

All the information about the Labs can be found in this page.

## Quizzes:

There will be quizzes on the material covered in class that combined will count for 5% of your final grade. The dates of the quizzes and the topics for each quiz will be announced in class.

## Midterms Exams and Final Exam:

The Midterms Exams and the Final Exam will be strictly closed book: no books, notes, formula sheets or calculators will be allowed. **Missing a midterm normally results in a mark of 0.** Exceptions may be granted in two cases: prior consent of the instructor or a medical emergency. In the latter case, the instructor must be notified within 48 hours of the missed test, and presented with a doctor's note immediately upon the student's return to UBC. **In such cases, there will be no make-up exam.** Instead, the final exam mark will be adjusted to make up for the missed midterm mark. The detailed policy on missed exams can be found in the Math 152 Website.

## Important Dates:

The following dates are posted to help you organize your schedules. They are subject to modification but that is unlikely. Please, check our section's website for current information.

<b>Last day to withdraw:</b>	Without a W standing: Monday, January 14. With a W standing: Friday, February 8.
<b>First Midterm:</b>	Thursday, February 7. During class.
<b>Second Midterm:</b>	Tuesday, March 19. During class.
<b>Final Exam:</b>	Date to be announced. Exam Dates: April 10-24.

## Office Hours:

I will have two office hours per week. I will hold my office hours on:

<b>Office Hour 1:</b>	Tuesday, 9:30-10:30am, Math Learning Center, LSK 303.
<b>Office Hour 2:</b>	Thursday, 9:30-10:30am, Math Learning Center, LSK 303.