

# Matrix Algebra with Applications

MATH 308 N—Spring 2016

MWF 3:30-4:20 in Lowe 102

**Instructor:** Chris Fowler

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**Course Website** <http://www.math.washington.edu/cff2008/308N-Spring16/>

**Office Hours:** Mondays and Wednesdays 4:20-5:20 in Low 102, assuming the room will be free. Hours may change on exam weeks.

**Course Description:** This is an introductory course in linear algebra intended for mathematics, engineering, and science students. Topics will include solving systems of linear equations, vector spaces, matrices, subspaces, orthogonality, eigenvalues, eigenvectors, and applications. It is worth noting that 308 may be more conceptual than the math courses you have taken in the past; there are very few formulas to memorize, but many definitions to understand and use in abstract arguments.

**Textbook:** *Linear Algebra with Applications* by Jeffrey Holt. You may purchase a copy or use the electronic version provided with Webassign

**Grading:** Your grade will be determined as follows:

Homework	15%
4 midterms, drop lowest	85%

A curve will be made using the final grade determined from these scores. The median score will be between 2.7 and 3.1, depending on the performance of the class.

**Homework:** Homework assignments will be assigned and collected through Webassign. Assignments will generally be due at 11 p.m. on Thursday though exceptions may be made, e.g. during holiday or exam weeks. I will be sure to announce any changes to due dates both in class and via email. Information about how to use Webassign can be found at

<http://www.math.washington.edu/taggart/m308/UWCommon/howtowebassign.html>.

**Exams:** You will be allowed to use both sides of a single **handwritten** 8.5 x 11 inch sheet of notes. **Calculators and other electronic devices will not be permitted.** These are the tentative dates for the exams:

Midterm 1	Friday, 4/15	in lecture
Midterm 2	Monday, 5/2	in lecture
Midterm 3	Monday, 5/16	in lecture
Midterm 4	Friday, 6/3	in lecture

**Make-ups:** In case of observance of religious holidays or participation in university sponsored activities, notify me at least 1 week in advance for the midterm. You will be required to provide documentation for your absence. Make-up exams will not be given otherwise. For example, sickness and family emergencies are not excuses for missing multiple midterms. This is why you are allowed to drop one.

**Academic Dishonesty:** Don't cheat. Any cheating will result in a 0 on the midterm, and it will not be admissible as your midterm drop.

**Note to Students:** Many of you may struggle with the jump in difficulty between the computational techniques and the abstract ideas of the course. Here are some relevant words of advice from a fellow instructor:

*"To reduce this jump you must be sure that you understand not only how to solve the homework problems, but also the concepts (i.e., definitions, theorems, and, to the extent you're able, their proofs) discussed in lecture and in the book.*

*Another important thing to understand about this course, especially if you plan to go into an engineering or other applied science field, is that everything we'll do this quarter can be done very quickly by computers, much more quickly (and reliably!) than a human can do by hand. Hence the point of the course is not only for you to memorize the algorithms. Rather, in order to program the computer properly you have to know what you want to do and why it is possible. Knowledge of the underlying theory will enable you to understand how and why the software doesn't give expected results (as will inevitably happen at some point). This underscores my remarks above concerning the due diligence you should afford the conceptual material."*

**Resources:**

- The University of Washington is committed to providing access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation contact the Disability Services Office at least ten days in advance at: 206-543-6450/V, 206-543-6452/TTY, 206-685-7264(FAX), or dso@u.washington.edu.
- The Student Counseling Center provides academic skills workshop on a variety of topics including stress management test anxiety and time management to help you succeed at the University of Washington. If any of these is an issue for you, check out the schedule of workshops at <http://depts.washington.edu/scc/studyskills.html>.
- The Center for Learning and Undergraduate Enrichment, or CLUE, is a free tutoring service for students. Along with drop-in tutoring, they also hold review sessions before exams, midterms, and final exams.

**Calendar**

<b>Week</b>	<b>Monday</b>	<b>Wednesday</b>	<b>Friday</b>	<b>Homework</b>
<b>1</b>	3/28 1.1	3/31 1.2	4/1 1.4, 2.1	1.1, 1.2
<b>2</b>	4/4 2.1	4/6 2.2	4/8 2.3	1.4, 2.1, 2.2
<b>3</b>	4/11 2.3	4/13 Review	4/15 MT1	2.3
<b>4</b>	4/18 3.1	4/20 3.1	4/22 3.2	3.1
<b>5</b>	4/25 3.2	4/27 3.3	4/29 3.3/Review	3.2, 3.3
<b>6</b>	5/2 MT2	5/4 4.1	5/6 4.2	
<b>7</b>	5/9 4.2	5/11 4.3	5/13 Review	4.1, 4.2, 4.3
<b>8</b>	5/16 MT3	5/18 5.1	5/20 6.1	
<b>9</b>	5/23 6.1/6.5	5/25 6.3	5/27 6.4	5.1, 6.1, 6.5
<b>10</b>	5/30 HOLIDAY	6/1 Review	6/3 MT4	6.3, 6.4

*1.1 lines 1.2 matrices 2.1 vectors 2.2 span 2.3 linear independence  
 3.1 linear transformations 3.2 matrix algebra 3.3 inverses  
 4.1 subspaces 4.2 basis and dimension 4.3 row and column spaces  
 5.1 determinants 6.1/6.5 eigenvalues 6.3 basis change 6.4 diagonalization*