

MATH 349-080
TR 9:30–10:45, PRN 232/EWG 205

Elementary Linear Algebra
Fall 2014

Web Page: <http://www.math.udel.edu/~edwards/download/m349/f14home.html>
(also referenced from QR code at end of document)

Instructor: Prof. D. A. Edwards Office Hours: M 9:30–10:30 W 1:30–2:30 or by appointment
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Introduction (Revised Version)

Welcome to Elementary Linear Algebra! Since many of you are not mathematics majors, the focus of this course will be on the *applications* of linear algebra, rather than the *theory* behind it (except when explaining the theory will enhance your understanding of the concepts). I will be passing around a sheet today asking each of you what your major is. Then I will try to present examples from those subjects so that you can see how linear algebra is applied to your area of interest.

The text for this course is *Linear Algebra: A Modern Introduction*, 4th ed., by Poole. **The text is required**, since you will be assigned both reading and homework problems from the book. Though we will be covering most of the material in the book, I will be presenting some of the material in a different order. In addition, I will also be lecturing from various other sources, so class attendance and participation is necessary for successful mastery of the material.

If you have any questions, contact me during my office hours or make an appointment. **Extra copies of handouts are available at the Web page listed above.**

Please silence cellular phones before entering the classroom. There will be no makeup classes for snow days unless mandated by the University.

Electronic Communication

The Web page for this course is listed on the top of the first page. There you will find copies of handouts available for downloading. Important announcements (corrections to typographical errors, etc.) will be handled by e-mail. Also at the URL

<http://www.math.udel.edu/~edwards/download/suggest.html>

you will find an anonymous suggestion box.

Homework

In most cases, homework will be distributed on Thursdays during lecture (the first assignment is attached to this introduction), and will be due at the beginning of class the following Thursday. The homework will cover material up through the day of its distribution. **ABSOLUTELY NO LATE HOMEWORK WILL BE ACCEPTED!** If you must miss a due date because of University business, it is your responsibility to make sure the homework gets to me *before* the due date. Since mathematics is a subject where the material for one section builds on the section before, it is critical that you keep up to date on the homework: hence the stringent policy. However, to calculate your semester-long homework average, I will drop your two lowest homework scores. Therefore, low scores for assignments where you were pressed for time can be erased as long as you don't have too many of them.

Though you may not copy directly from another's paper or use someone else's ideas as your own¹, I encourage you to discuss the homework problems with your classmates. Any scientific endeavor is rarely done in a vacuum; therefore it is to your advantage to learn the benefits of collaborating. Model homework solutions will be placed on reserve in the library after the assignment is due. Hopefully these will assist you in learning the material.

Homework assignments should be folded like a book with the following information on the "front cover:"

Name
Math 349-080—Edwards
Assignment Number
Date

You will turn in your assignments this way so that I may put your grade on the inside, thus ensuring your privacy. I will make every effort to ensure that your graded homework is returned in a timely manner.

Each homework assignment will consist of ten questions. Of those, some randomly selected problems will *not* be graded. For these questions, you will receive one point if you attempted the problem. For the problems that will be graded, you may receive up to four points, depending on the completeness and accuracy of your solution.

Obviously, I can assign only a select few homework problems to be turned in. Therefore, I choose ones which, if mastered, show adequate understanding of the material. The examinations

¹ For more details regarding academic dishonesty, see the Student Handbook (<http://www.udel.edu/stuguide/>).

will largely be based on the material covered in the homework assignments. However, you are encouraged to try other problems in the book for practice.

Exams

There will be four exams in the course; the dates are listed on the attached schedule. **NO MAKEUP EXAMS WILL BE GIVEN!** The first three will be 70 minutes long and will take place during a regular lecture period. The final exam will be two hours long. Each exam will contain problems which must be done using Mathematica; hence you must bring a laptop to class. **If you do not own a laptop, please see me.**

Attached to each examination will be a course evaluation form, so that I may receive your suggestions for how the course could be improved. These forms will be seen only by me, so if you have comments that you wish the department to hear, please contact them directly.

When the exams are returned, they will have a numerical score and a letter grade on them. The numerical score is your score for the exam; *the letter grade is your grade for the course to that point, including all homework scores.*

Honors Project

The honors component of this course will be a project where you will investigate an application of linear algebra in depth. Shortly I will give you a list of real-world topics that use linear algebra. You will choose a phenomenon which interests you, create a simple model to describe it, and then solve the equations governing the model using the techniques you have learned in this class. You will then write a report chronicling your study. Further details will follow.

Assessment

Your grade for the course will be determined in two stages. First your *raw score* will be calculated using the *higher* of the two algorithms:

- 1) The exams will count for 75% of your grade (final counts double), the homework counts 10%, and the project counts 15%.
- 2) The exams will count for 65% of your grade (final counts double), the homework counts 20%, and the project counts 15%.

Therefore, performing well on the homework will not only help you learn the material, it can also directly help your grade. (In the past, it has been my experience that the vast majority of students improve their grades by using their homework scores.) Then each of the raw scores will be scaled to determine final grades.

Tentative Schedule

Note: This is only a tentative schedule; there may be deviations from it.

week of August 25: sections 1.1, 1.2, vector analysis (parts of sections 2.3 and 3.5)

August 26: Homework 1 distributed

week of September 1: sections 1.2, 2.1, 2.2

September 4: Homework 1 due; Homework 2 distributed

week of September 8: sections 2.2, 2.4, 3.1, 3.2

September 11: Homework 2 due; Homework 3 distributed

week of September 15: sections 3.1–3.3, 3.5, 6.1

September 18: Homework 3 due; Homework 4 distributed

September 23: Exam I (covers vector analysis, chapters 1 and 2, sections 3.1, 3.2)

September 25: sections 3.5, 6.1

week of September 29: sections 3.5, 6.2, 6.3, 7.1, 7.2

October 2: Homework 4 due; Homework 5 distributed

week of October 6: sections 5.1, 5.2, 7.1, 7.2

October 9: Homework 5 due; Homework 6 distributed

week of October 13: sections 5.2, 5.3, 7.1, 7.3

October 16: Homework 6 due; Homework 7 distributed

October 21: Exam II (covers sections 3.3, 3.5, 5.1–5.3, 6.1–6.3, 7.1, 7.2)

October 23: sections 3.6, 6.4, 6.5, 7.3

week of October 27: sections 4.2, 6.5, 6.6

October 30: Homework 7 due; Homework 8 distributed

November 4: Election Day (no classes)

November 6: section 4.2

week of November 10: sections 4.1, 4.3

November 13: Homework 8 due; Homework 9 distributed

November 18: sections 4.3, 4.4

November 20: Exam III (covers sections 3.6, 4.1, 4.2, 6.4–6.6, 7.3)

November 25: section 4.4

November 27: Thanksgiving (no classes)

December 2: review

December 2: Homework 9 due; supplemental study material distributed

TBA: Final Exam (covers entire course, but especially sections 4.3, 4.4)

Course Web Page:

