

MATH 3013.63824—Linear Algebra—Fall, 2018

MWF 12:30 PM-1:20 PM, PS 355

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Office Hours: MWF 2:30–3:20 PM or by appointment

Online Classroom (Desire to Learn, “D2L”): <https://online.okstate.edu> Check this site for announcements, lecture notes, updates, exam scores and solutions, grade estimates, and other material.

Homework Login: <https://www.webassign.net/login.html> This is where the online homework will be assigned, submitted, and graded using the WebAssign system.

WebAssign Information: webassign.com/students This contains instructions on how to enroll in WebAssign for this course. You will need the *Class Key* for this section, which is okstate 9928 3664. It also contains a link to the WebAssign support center.

Note that there are two options for purchasing access to WebAssign. (1) You can buy an access code from the OSU Bookstore for “Cengage Unlimited.” This allows you access to WebAssign for other courses you are taking this semester that use Cengage textbooks. (2) You can buy an access code just for this course directly from WebAssign.

Text: *Linear Algebra, A Modern Introduction, Fourth Edition*, by David Poole. We will cover sections 1.1-1.4, 2.1-2.4, 3.1-3.7, 4.1-4.4, 4.6, 5.1-5.5, 6.1-6.2, and 6.4. Additional topics may be covered as time permits. Your WebAssign subscription provides an online version of this book. Please note that the OSU Bookstore does not have any physical copies of the book.

Exams: There will be three fifty-minute midterm examinations. They will be announced in class and on D2L. A comprehensive final examination will be administered from 10:00 to 11:50 AM on Wednesday, December 12. Unless otherwise indicated, exams will be closed book, closed notes.

Quizzes: Several times during the semester a quiz (closed book and closed notes, unless otherwise indicated) may be given. These quizzes are intended to cover topics that are not adequately covered by WebAssign. Quizzes will be announced in class and on the D2L Course Homepage. The individual quizzes may be graded on different point scales. At the end of the course these quiz scores will be combined with your total WebAssign score in a manner yet to be determined.

Grading: At the end of the course your WebAssign + Quiz score will be adjusted by calculating a percentage out of a smaller number of points (a so-called “perfect score”) but without going over 100%. For example, if there were 500 points available and the “perfect score” were 400 points, then a student making 350 points would get $350/400$ for 87.5% instead of $350/500$ for 70%. Note that a student making 450 points would get $400/400$ for the maximum percentage of 100%, not $450/400$ for 112.5%. (Note that this is just a numerical example; these numbers do not necessarily reflect what numbers will actually be used in the grading.)

A total course percentage will be computed using each of the following schemes. You will receive the higher of the two percentages.

Scheme 1	
3 hour exams	15% each
Final exam	25%
Homework & Quiz	30%

Scheme 2	
3 hour exams	10% each
Final exam	40%
Homework & Quiz	30%

A total course percentage of 90% will ensure an A, 80% will insure at least a B, 70% at least a C, and 60% at least a D. (Depending on the distribution of scores, it is possible that lower cutoffs may be used.)

Partial Credit: On exams the amount of partial credit will depend primarily on how much of a problem you do correctly. It is extremely important that you write down all of the steps involved in getting your final answer, not just the final answer by itself, in order to ensure credit. In general, once you make a mistake or deviate from the method required on that problem you will receive no credit on the rest of the problem.

Some Cautions: In general WebAssign requires exact numerical answers. For example, if the exact answer is $2/3$ WebAssign may count things like 0.666666 and 0.666667 as wrong. The solution of a linear algebra problem generally involves a long sequence of individual calculations. Rounding off these intermediate results sometimes causes the error to grow to such an extent that the final answer is very inaccurate. So when fractions arise leave them as fractions, do the arithmetic as fractions, and give the final answers as fractions. Similar remarks apply to radicals. If something like $\sqrt{3}/2$ arises don't express it as 0.866025. WebAssign will tell you how to enter such things, for example as `sqrt(3)/2`. Similar requirements will apply to exams and quizzes. In the examples above you would write $2/3$ and $\sqrt{3}/2$.

The main computational object in linear algebra is a matrix. This is a rectangular array of numbers. It can be regarded as a collection of rows of numbers where the rows are stacked vertically. The main computational tool in linear algebra is a row operation. A row operation changes a matrix into a (usually different) matrix. There are three types of row operations. One can multiply a row by a non-zero number; this is denoted by kR_i , which means multiply each entry of the row R_i by k . One can interchange two rows; this is denoted by $R_i \leftrightarrow R_j$. One can replace a row by its sum with a multiple of a different row; this is denoted by $R_i + kR_j$. In this last case R_i is erased and then replaced by $R_i + kR_j$. Note that, for example, $R_1 + R_2$ is not the same thing as $R_2 + R_1$! In all your work with row operations on exams and quizzes you will be required to tell me what you are doing before you do it. Points will be taken off if you do not do this.

There are certain sequences of row operations which are used to change a matrix into a useful form called a "row echelon form" or a "reduced row echelon form." In the book these are called "Gaussian elimination" or "Gauss-Jordan elimination." There are special forms of these that we will call "Gauss reduction," "Jordan reduction", and "Gauss-Jordan reduction." Make sure that you use the method specified in a problem. Don't do row operations at random hoping that you get the correct answer. You are being tested on your understanding of the particular method specified, not just on the final answer.

Online Material: The Online Classroom site for this course will contain general information and announcements, lecture notes, review sheets, and possibly other material, such as notes and exercises on supplemental topics and links to linear algebra resources on the Web.

MLSC: The Mathematics Learning Success Center, located on the fifth floor of Edmon Low Library, provides several services which may be useful to you; the website is at <http://www.math.okstate.edu/mlsc> and the phone number is 744-5818. In particular it provides tutoring for this course. Tutoring will be available at certain specified times which will be announced on the MLSC website.

Electronic Device Usage: On quizzes and exams you may use a calculator no more powerful than a TI-89. You may not use any other electronic devices, including computers, tablets, phones, music players, radios, or any device with a QWERTY keyboard. TI-83 calculators can be checked out for the semester for free from the Mathematics Department office, 401 MSCS during normal business hours as long as supplies last.

The main point in allowing you to use a calculator is to help you avoid making silly arithmetic mistakes. Although graphing calculators can usually do matrix calculations the input process is generally laborious and for small matrices one can generally do the calculation more quickly by hand. Remember also that you are expected to show each step of a problem. In general if you just write down the final answer to a problem without showing the intermediate steps you should expect no credit on the problem. For example, if you are required to compute the determinant of a matrix by cofactor expansion but instead use your calculator to do it then you should expect no credit on the problem even if you obtain the correct number.

Makeups: Makeups for exams will be given only for serious and unavoidable reasons. You should try if at all possible to contact me before the regularly scheduled exam time. These makeup exams may be somewhat harder than the original exams.

Syllabus Attachment: This document contains further information on such things as drop dates, incomplete grades, special accommodations for students with disabilities, academic integrity, where to go for help on various issues, and general university policies. It is available on the course D2L site as well as at the following website: Go to <https://academicaffairs.okstate.edu>. Click on Students, then from the menu choose Resources for Students. Then click on Current Syllabus Attachment.