

Instructor information:

Instructor: Dr. Allison H. Moore

Office: Harris Hall 4149

Office hours: To be held over Zoom

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Course information:

MATH 310 - 003. Linear Algebra (Mathematics). Term: Spring Semester, 2021. CRN: 33261

Class Meetings: 9:00 am - 9:50 am MWF, Course taught online

Online meetings and course design:

This course is designed so that it can be done entirely remotely. Course materials will be delivered by video, lecture notes will be posted online, and homework assignments and exams will be assigned online. All of this is designed so that you, the student, can take this course at your own pace, with a high degree of flexibility should you encounter illness, family or work responsibilities, or other issues that impact your schedule, health and semester.

Because of this, the primary purpose of our online meetings will *not* be to deliver lectures. Instead, most of the lecture content will be pre-recorded in short video segments and posted online with accompanying notes. Video recordings of lectures will be condensed, and more detail can be found in the notes, the textbook, and discussed during our Zoom meetings. We will use our online time together to ask and answer questions, and to work with other students on practice problems, and for periodic quizzes. Attendance during our weekly meetings is highly recommended.

All real-time online meetings will be conducted via Zoom at the following URL/Meeting ID:

<https://vcu.zoom.us/j/98304589347>

Meeting ID: 983 0458 9347

Prerequisites:

MATH 201 with a minimum grade of C.

Textbook:

The official textbook is *Elementary Linear Algebra, Eighth Edition* by Larson.

ISBN: 978-1-305-65800-4

Note: You are *not* required to purchase or rent a physical copy of the textbook for class. The only purchase you must make is a digital subscription to WebAssign, which comes with access to an eBook version of the textbook online. Some students prefer a paper edition for studying; for this, you can rent the textbook, purchase it, or alternatively, find a cheaper paper version of an older edition textbook online.

Course website:

A Canvas page is set up for the course. (See <https://canvas.vcu.edu>)

Important announcements, a copy of the syllabus, lecture notes, study guides, quizzes and take-home exams will be posted to Canvas. Check this website regularly and make sure you receive email announcements that go through Canvas. We will use WebAssign for online homework. This is a different website than Canvas.

Learning Objectives

The purpose of this class is to introduce students to the fundamental objects and concepts in linear algebra, including scalars, vectors, matrices, diagonal matrices, symmetric matrices, inverse matrices, singular & nonsingular matrices, permutation matrices, linear combination, linear dependence & independence, vector spaces, subspaces, the dimension of a vector space, bases of vector spaces, rank, nullity, the four fundamental subspaces associated with a matrix, projections, determinants, permutations and cofactors, and eigenvectors & eigenvalues, and the fundamental operations on these objects including the dot product, matrix multiplication, matrix transpose, Gaussian elimination, Gauss-Jordan elimination, LU decomposition, matrix factorizations, reduction of a matrix to row reduced echelon form (RREF), the solution of systems of linear equations in an arbitrary number of unknowns, the least squares procedure and the Gram-Schmidt procedure.

Lecture Notes and Videos

Lecture notes in PDF format will be posted to Canvas. There is one lecture per class period. Each lecture is accompanied by a collection of short videos that explain the content of the lecture notes. The lecture videos are numbered compatibly with the lecture notes and the corresponding homework assignment. So for example, Lecture3.pdf covers the material from our third class meeting. Video lectures 3.1, 3.2 and 3.3 go along with the notes in Lecture3.pdf. Homework Assignment 3 will cover this same material. Lecture videos will be linked to within Canvas and hosted on YouTube. A YouTube playlist containing all lecture videos for the semester (in order, and to be updated regularly) can be found at the following URL:

<https://www.youtube.com/watch?v=tcRBZRgVIg&list=PL1oREv7xaaknZHxESRhMP24GeL9-xABFi>

WebAssign Homework

Online homework is to be accessed and submitted for automatic grading with WebAssign. I still recommend that you work out these problems with paper and pencil, and keep track of your work in a folder or binder with your class notes. Remember that homework is mainly for practice to help you understand the material, and you may want to review your work when studying for exams.

You are permitted to work with other students on the homework, and to discuss your work and solutions to homework with others before submitting. Homework is for practice, and talking to others will help you learn the material.

To set up WebAssign:

1. Go to GetEnrolled.com or <https://webassign.net/login.html>

2. Enroll with this class key: **vcu 8045 2645**
3. Verify that the course information displayed is correct.

WebAssign set-up instructions are also provided on YouTube: https://www.youtube.com/watch?v=vM_XTu83c8c

Note: At some point you will be prompted to create a Cengage account. The only feature that is required is regular WebAssign access, which should cost \$100. If you have more than one class this semester that also uses WebAssign, it might be less expensive purchase Cengage Unlimited option, but for most students this will not be the case.

Exams:

All exams for this course (midterms and the final) will be conducted as “at-home” exams. A PDF of the exam will be posted to Canvas, and students will be given a broad time frame to complete the exam. The exams are to be completed either on paper, or using a tablet with a stylus. Your handwritten exam solutions, formatted as a PDF, will be returned by online submission. Exams may also include short-form questions (e.g. True/False, numerical answers) that are to be completed through Canvas, within the designated class time.

I will be creating at-home exams that are designed to be open-book, open-notes and with calculators permitted, restricted to our own course materials. The use of the internet, or any other method of asking for and receiving help from another individual or resource will be strictly forbidden on these exams. **You are NOT allowed to post exam questions anywhere online, including but not limited to the websites Stackexchange, Chegg, Quora, Slader, Coursehero or anywhere on social media.** Doing so is considered cheating, and the penalties for being caught cheating can be quite severe. Be aware that many of these websites now cooperate with universities to provide information about users and account activity.

The final exam will also be conducted as take-home exam. Final exam times are set by VCU here: <https://rar.vcu.edu/exams/index.html>.

Midterm 1	Monday, February 22	at-home exam
Midterm 2	Friday, March 26	at-home exam
Midterm 3	Friday, April 23	at-home exam
Final Exam	Friday, May 7	at-home exam

Make-up exams If you miss an exam and have a documented or otherwise valid excuse, I will work with you to coordinate a make-up exam. Likewise, if the final exam for our class creates a conflict with your other take-home exams, I will work with you to find an alternate time.

Real-Time Quizzes

We will have quizzes approximately 6 times throughout the semester on Fridays. Quizzes will be timed, and conducted in real-time, during our Friday 9am meetings. Quizzes will be short, easier than test questions, and designed to keep you up to speed. The quiz may be formatted in several different ways: through Canvas, through WebAssign, or through file upload. All of the quiz scores

will be averaged together. The quiz average is worth the same as a midterm. The quiz schedule will be posted to Canvas as part of our general class schedule.

Real-Time Group Work

Alternating with quizzes, we will have group work practice problems weekly. Group work is highly recommended. Although participation in group-work break out sessions is not strictly required, I will offer extra credit points for group work participation.

Grades:

Your grade will be determined by the following:

Homework	20%	Averaged together	Lowest score dropped
Quizzes Average	20%	Averaged together	
Midterm 1	20%	Non-cumulative exam	
Midterm 2	20%	Non-cumulative exam	
Midterm 3	20%	Non-cumulative exam	
Final	20%	Cumulative exam	Not dropped
Group work participation		Bonus	

About curves: The default bracketing of letter grades is as follows: $A : 90 - 100\%$, $B : 80 - 89\%$, $C : 70 - 79\%$, $D : 60 - 69\%$, and $F : 0 - 59\%$. You should plan on estimating your progress throughout the semester with this letter grade distribution.

Depending on the severity of the midterms and final exam performance, I may choose to apply a “curve” at the **end of the semester**. What this means is that I reserve the right to adjust the letter grade brackets. However, your letter grade will **never** drop below the initial generic bracketing. While my typical curve might improve your letter grade over the raw numerical score, it usually doesn’t change the grade much. In general, it is not a good strategy to count on the curve to raise your grade. The instructor reserves the right to offer bonus or extra-credit assignments.

Asynchronous content and pacing

This course is designed to be flexible and entirely remote in order to accommodate disruptions to your health or schedule. It is more important than ever to stay on top of the course material and to manage your time accordingly. Self-pacing is absolutely critical. Attendance during weekly Zoom meetings is highly recommended. Watching videos and reading lecture notes is required. Exams and quizzes will be based largely upon the content of the lecture notes and videos, which we will discuss during our weekly meetings. Course content is organized into weekly modules and homework will be assigned weekly. It is intended to keep you on pace. Plan to devote 3 hours each week towards studying lecture notes and videos, and *at least* 3 hours per week on homework. Additionally there are (up to) two and half hours of Zoom meetings per week.

Tips for Success:

- Make yourself a calendar with all of your due dates across ALL of your courses. Plan for when you will work on each one for completion in advance of the due dates.

- Add Zoom/online meetings to your weekly calendar.
- Avoid the common assumption that online courses are easier or should be easier. That is not the case!
- Plan ahead: Study as you go instead of at the last minute. Keep a tidy folder, spiral or binder of your notes and your homework solutions that you can use when studying for midterms and the final.

Academic Help:

Our Zoom meetings are your first stop. I am happy to answer questions, work examples and help you understand the homework. I can also do this in a one-on-one Zoom appointment or during office hours.

The Campus Learning Center at VCU offers appointment, drop-in and group tutoring in undergraduate courses across the disciplines: <https://clc.vcu.edu/tutoring/>

Honor System: upholding academic integrity

The VCU Honor System policy describes the responsibilities of students, faculty and administration in upholding academic integrity. According to this policy, “Members of the academic community are required to conduct themselves in accordance with the highest standards of academic honesty, ethics and integrity at all times.” Students are expected to read the policy in full and learn about requirements here: <https://conduct.students.vcu.edu/vcu-honor-system/>

Our shared learning environment

I want you to know that I am grateful for your presence and appreciate your input in our online class. You are welcome here, and our diverse backgrounds make us stronger together. I am dedicated to providing a welcoming and inclusive environment for all students, independent of your immigration status, country of origin and/or citizenship, race, ethnicity, religious affiliation, gender/sex, gender identity, sexual orientation, age, ability or disability, socioeconomic status, or perspective. Thank you for joining my class and bringing your unique experience and background to our intellectual community.

Students with disabilities:

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, as amended, require that VCU provide “academic adjustments” or “reasonable accommodations” to any student who has a physical or mental impairment that substantially limits a major life activity. To receive accommodations, students must register with the Office of Student Accessibility and Educational Opportunity on the Monroe Park Campus (828-2253) or the Division for Academic Success on the MCV campus (828-9782). Please also visit the Student Accessibility and Educational Opportunity website via <https://saeo.vcu.edu/> and/or the Division for Academic Success website via <https://das.vcu.edu/> for additional information.

Once students have completed the registration process, they should schedule a meeting with their instructor (s) and provide their instructor (s) with an official accommodation letter. Students

should follow this procedure for all courses in the academic semester.

Requesting accommodations

The university recognizes that some students who previously did not need Section 504 Academic Accommodations, and who have a qualifying condition or disability, may need support or assistance during the return to campus process. A modified approach for the temporary and more permanent need for accommodation has been developed and implemented to provide students with full access to programs and activities related to their academic majors. Because every case is different, student requests are evaluated on a case-by-case basis. Please share your need for an accommodation with the Student Accessibility and Education Office, or for MCV Campus students, the Division for Academic Success, after you have worked directly with your faculty member.

Extended Syllabus:

Students should visit <http://go.vcu.edu/syllabus> and review all syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.