Math 220-03: Introductory Linear Algebra

Spring 2021

Instructor: Daniel Reiss
Email: daniel.reiss@wsu.edu
Class Time: TR 9:10am-10:00am
Office Hours: MTRF 2:00pm-3:00pm (or by appointment)
Phone: 509-335-0844 (Email is the preferred form of contact)
Zoom meeting ID/Password (for class): 963 6396 1604/126026
Zoom meeting ID/Password (for office hours): 915 3859 6171/146952

Note: Due to the COVID-19 pandemic and WSU's limit on class sizes that run face-to-face, this course will run online with synchronous interaction. You will receive regular updates from me about the course through Canvas and email. Please see below for WSU's policies regarding COVID-19.

COVID-19 Policy: Students are expected to abide by all current COVID-19 related university policies and public health directives, which could include wearing a cloth face covering, physically distancing, self-attestations, and sanitizing common use spaces. All current COVID-19 related university policies and public health directives are located at `https://wsu.edu/covid-19/`. Students who do not comply with these directives may be required to leave the classroom; in egregious or repetitive cases, students may be referred to the Center for Community Standards for university disciplinary action.

Course Materials:

- **Textbook:** *Linear Algebra and its Applications, 6ed.*; Lay, Lay, McDonald; Published by Pearson. [An eBook will be available when you purchase your MyLab access but you are welcome to purchase a physical copy.]

- **Video Lectures:** Additional video lectures created by Dr. Judith McDonald will also be made available on Canvas. Feel free to review these videos if you need any additional clarification of the course content.

- **Session Recordings:** Session recordings will be posted on Canvas after each session. I highly recommend attending the live sessions, however, if for some reason you cannot attend, you will be able to go back and watch a recording of what was covered that day.

- **Course Notes:** I will also post course notes on Canvas. You are expected to review the course notes. Bear in mind that the course notes may include examples that were not covered during the live lectures.

- **Additional Resources:** You may need to download the Wolfram CDF player in order to view the additional lecture videos. Use this link to access the download:

  `https://support.wolfram.com/topic/wolfram-player/download-installation`.

  We will also utilize Matlab in this course for computer projects. Matlab is available to every student enrolled in a math course through the WSU math department website.

Live Lecture Sessions: I will be holding live lecture sessions at the normal time our class would meet (TR 9:10am-10:00am). It is strongly recommended that you attend these sessions as I may spend additional time on difficult concepts. During these live lecture sessions we will solve problems together and you will have the opportunity to solve problems with your classmates in breakout rooms on Zoom.

Course Expectations: At the end of this course students will be able to:

- Use matrix representations to determine solutions sets of systems of linear equations.
- Determine solutions sets of matrix and vector equations.
- Understand and solve problems utilizing properties of linear dependence/independence, linear transformations, column/null space, and determinants.
- Perform computations using matrices and vectors such as matrix/vector addition and subtraction, matrix multiplication, matrix inverses, and vector dot product.

- Compute eigenvalues and eigenvectors of $n \times n$ matrices.
- Understand and solve problems utilizing properties of orthogonality, orthonormality, and inner product.
- Use concepts learned in specific applications.

Note: This is all material from Chapters 1-6 from the textbook (omitting Ch.4). We will not necessarily cover the entirety of a given chapter.

Attendance: I will not be taking any attendance for this course. However, I may reach out to you if I notice that you are not keeping up with course material.

Homework: Homework will be split into three categories:

- **Online Homework:** There will be online homework through MyLab. Each assignment will consist of roughly 8-10 exercises. There will be new assignments posted every Tuesday and Thursday and all assignments will be due by the date specified on MyLab (usually 1 week after it is assigned). Your online homework score will be weighted out of 100 points and will count towards 10% of your overall grade.

  To access MyLab from Canvas, use the access code WMLLAT-QISHM-TWINE-FACET-SARTO-TUNES

- **TA-Graded Homework:** We will have additional TA-graded problems on MyLab in addition to the standard online homework on MyLab. These problems may be a bit more involved than problems appearing in the standard online homeowork. Please visit my office hours and/or our course TA/grader's office hours if you have questions regarding these problems. The TA-graded homework will count towards 15% of your overall grade.

- **Computer Projects:** The computer projects are intended to give you some exposure to some useful software (such as MATLAB). The computer projects will not require any sort of prerequisite programming knowledge. I will provided additional information as go through the semester. The computer projects will count towards 10% of you overall grade

Late assignments will not be accepted unless we have had a discussion and an extension has been granted. If you have a problem completing an assignment then you need to contact me to discuss a possible extension. Keep in mind that an extension is not guaranteed.

Exams: We will have two exams throughout the semester. There will be one midterm exam and one final exam.

- **Midterm Exam:** We will have the midterm exam on March 12th, 6:00pm-7:30pm. The structure of the midterm exam will be announced as we get closer to those dates. The midterm exam will count towards 25% of your overall grade.

- **Final Exam:** The final exam will be held during finals week (May 3rd-7th). The specific time of our final exam (as listed on the WSU website) is May 3rd, 7pm-10pm. The structure of the final exam will be announced as we get closer to those dates. The final exam will count towards 40% of your overall grade.

Grades: Grades will be determined based on the following scale.

92%-100%	A
88%-91.9%	A-
84%-87.9%	B+
80%-83.9%	B
75%-79.9%	B-
71%-74.9%	C+
67%-70.9%	C
63%-66.9%	C-
59%-62.9%	D+
55%-58.9%	D
0%-54.9%	F

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the

Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations must be approved through the Access Center.

Academic Integrity: Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will receive a zero on the assignment (we reserve the right to give a grade of F for the course as well), will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct.

Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating: `http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010`. If you have any questions about what is and is not allowed in this course, you should ask the course instructor before proceeding.

If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at `http://conduct.wsu.edu/academic-integrity-policies-and-resources`.

Mathematics Learning Center (MLC): Successful students make use of available resources, so don't struggle when help is just a few steps away. We want you to succeed, we're here for you, and our tutoring services are completely FREE.

The MLC will continue to offer virtual tutoring via Zoom this semester. You can find current information on how to connect with a tutor on our website: `http://www.math.wsu.edu/studyhalls/welcome.php`

In addition to virtual tutoring, the MLC will also host a forum where students can post questions to be addressed by our MLC tutors as well as provide an opportunity to connect with other students taking the same course. Visit `https://mathlab.math.wsu.edu/phpBB3` and create an account to start connecting with our tutors. (Note: This is a monitored forum. Please read the guidelines posted on the forum before posting.)

Religious Observances and Activities: Washington State University reasonably accommodates absences allowing for students to take holidays for reasons of faith or conscience or organized activities conducted under the auspices of a religious denomination, church, or religious organization. Reasonable accommodation requires the student to coordinate with the instructor on scheduling examinations or other activities necessary for course completion. Students requesting accommodation must provide written notification within the first two weeks of the beginning of the course and include specific dates for absences. Approved accommodations for absences will not adversely impact student grades. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who feel they have been treated unfairly in terms of this accommodation may refer to Academic Regulation 104: Academic Complaint Procedures.

Levels of Mathematical Understanding: The following table clarifies the different levels of mathematical understanding that lead to success in this course.

Level 1	Watch someone else work through a problem and follow along	Ready to learn
Level 2	Solve a problem similar to one worked out in class	Beginning to understand
Level 3	Look at a problem and recognize the methods which could be useful. Solve the problem without reference to notes.	Minimal understanding
Level 4	Solve a problem (Level 3) and clearly explain the solution to a classmate.	Understands content at an acceptable level.

Course Schedule: The following schedule is tentative and is subject to change.

Week of	**Topic**
January 18th	1.1-1.2 (Systems of Linear Equations)
January 25th	1.3-1.4 (Vectors and Matrix Equations)
February 1st	1.5 (Homogeneous Matrix Equations)
February 8th	1.6-1.7 (Applications and Linear Independence/Dependence)
February 15th	1.8-1.9 (Introduction to Linear Transformations)
February 22nd	Review of Ch.1
March 1st	2.1-2.2 (Matrix Operations and Inverses)
March 8th	2.3, Midterm (Inverses)
March 15th	2.8-2.9 (Subspaces of $\mathbb{R}^n$ and Bases)
March 22nd	3.1-3.2 (Properties of Determinants)
March 29th	5.1-5.2 (Eigenvalues and Eigenvectors)
April 5th	5.3 (Eigenvectors and Eigenvalues)
April 12th	6.1 (Orthogonality and Inner Product)
April 19th	6.2, 6.4 (Orthogonal Sets and Gram-Schmidt)
April 26th	Review for Final
May 3rd	Review for Final Exam Week (Final on May 3rd 7pm-10pm)

We will not have class on Feb. 25th or Apr. 13th.