Math 203 - Linear Algebra
George Mason University
Summer 2020, B Session

General Class Information:

Location:	Blackboard: https://mymason.gmu.edu/
Date Range:	June 1 - July 24, 2021
Instructor:	Hannah Klawa, Graduate Lecturer
Email:	hklawa@gmu.edu
Class/Office Hour Times:	WF 1:30 PM - 3:00 PM EDT and by appointment
Class/Office Hour Location:	Zoom via "Online Classroom" link in Blackboard

Textbook: Lay, Lay, McDonald, *Linear Algebra and its Applications* - Access, 6th edition, Pearson, 2021. ISBN: 9780135851159

Technology: You will need a computer with reliable internet access. You will also need a scanner or a camera for creating an image of your work for show-work quizzes.

Other Supplies: You will need paper and a black or very dark ink pen or marker. A notebook (electronic or traditional) is strongly recommended.

Course Description: This is a first semester course in linear algebra. The class covers systems of linear equations, linear independence, linear transformations, inverse of a matrix, determinants, vector spaces, eigenvalues, eigenvectors, and orthogonality.

Email Policy: Please email me if you have any questions during the course. Please note that all emails to me ***must*** be sent through your official George Mason University student email account. If you email me from a non-GMU email, you will not get any response. Also, please use the following subject line format

Math 203 - Subject of Email

as it helps me prioritize student emails.

You should receive a response within 24 hours for emails sent Monday - Friday and within 36 hours for emails sent Saturday - Sunday. If you do not receive a response in this time-frame, please resend your email.

Lecture Material: All lecture videos and handouts will be provided on Blackboard in asynchronous format.

Class/Office Hour Attendance: Please watch the lectures before coming to class. I do not lecture during class time. The class time will be used for student questions and interactive problem solving. The lecture material is provided ahead of time so that you can use this time to interact with myself and your peers in real-time in an informal, interactive way. Attendance is strongly encouraged but is not part of your course grade. If my class/office hour times do not work for you, you can schedule by appointment times to meet online. Please email at least 24-hours before your requested meeting with a couple day(s)/times that work for you.

Asking Questions During Class/Office Hours: You will be able to ask questions via chat or unmute your mic and ask relevant questions any time during the online class/office hour. If you hear another student ask a question and I did not hear what the question was or you see a chat question got overlooked due to volume of chats, you can help to ask the question. Please do remember that a civil, academic learning environment must still be maintained. Note that this is only for this particular course. Please follow your instructor's preferred method for questions in your other courses.

Grading Scheme: Your grade will be weighted as follows.

Category	Weight
Homework	20%
Show-Work Quizzes	25%
Midterm Exam	20%
Final Exam	35%

Your letter grade will be determined based on the following grading scale.

Grade	Letter Grade
$97-100\%$	A+
$92-96\%$	A
$89-91\%$	A-
$87-88\%$	B+
$82-86\%$	B
$79-81\%$	B-
$79-81\%$	C+
$72-76\%$	C
$69-71\%$	C-
$61-68\%$	D
$0-60\%$	F

Homework: Your homework grade in this course comes entirely from the MyLab homework system. **You will have 2 homework sets each week that are due Saturdays at 11:59 PM EDT.** While you will not need to submit your work for the problems, you should carefully write out your work to each problem in a notebook in order to be well prepared for quiz and exam problems. Late homework will be accepted with 20% late penalty if it is submitted by the last day of class (July 21, 2021). However, it is very important not to get behind on the homework as you will not be prepared for quizzes and exams without completing the homework.

Show-Work Quizzes: Most weeks, you will have a 25 minute quiz on the previous week's material in Blackboard. It will become available Thursday at 12:01 AM EDT and be due Friday at 11:59 PM EDT. The quiz can be taken anytime during the availability as long as it is submitted by the deadline. The quiz will consist of both multiple-choice and show-work problems. For show-work problems, you will write your work for the problem and show/explain how you arrived at your final answer. You will upload an image of your work. You must carefully show all steps and explain your reasoning to get credit. On the show-work problems, final answers without supporting work and explanations will be given no credit even if the final answer is correct. You will lose credit for incorrect work even if your final answer is correct. **No late quizzes are accepted and there are no make-up quizzes given.** One lowest quiz score will be dropped.

Midterm Exam: The midterm exam cannot be taken early or late. There is a **no make-up policy** for the midterm exam.

- **Availability:** Thursday June 24, 2021 at 12:01 AM EDT - Friday June 25, 2021 at 11:59 PM EDT.
- **Time Limit:** 90 minutes (or until deadline - whichever comes first).
- **Due Date:** The midterm exam must be completed by Friday June 25, 2021 at 11:59 PM EDT.

Final Exam: The final exam cannot be taken early. You must take the final exam to pass the course. Unexcused absence from the final exam results in a score of F in the course per GMU final exam policy.

Absence from the final exam will not be excused except for cases of extreme illness during the exam availability confirmed by physician's note or for other causes approved by the student's academic dean or director. In this case, you can request an incomplete if you are passing the course excluding the final exam.

- **Availability:** Thursday July 22, 2021 at 12:01 AM EDT - Friday July 23, 2021 at 11:59 PM EDT.
- **Time Limit:** 165 minutes (or until deadline - whichever comes first).
- **Due Date:** The final exam must be completed by Friday July 23, 2021 at 11:59 PM EDT.

Extra Credit Discussion: There is an extra credit discussion forum available in Blackboard. Participating in weekly discussions will count for extra credit. Please see the details posted in Blackboard for requirements to earn full extra credit. You can earn up to a total of 3% by earning full credit in 4 of 7 weekly discussions. To earn full credit in a given week, you must post 3 substantial discussion posts over 2 different days (days are counted by date/time stamp of the post in Blackboard). One sentence posts, copied posts, or posts that are simply material stated in the textbook are not counted. You can post meaningful questions, helpful partial or complete answers to others' questions, answers to discussion prompts, or an explanation of an application (not mentioned in textbook section) of the material learned.

Substantial	**Not Substantial/Unacceptable**
Can anyone help me with homework problem 2.3#5? I don't know where to go from here. Here is what I have tried...(your attempt/explanation of question) *This is asked in a way that someone can understand and demonstrates that you attempted the problem.*	I don't understand this problem. *This is not a question and gives no detail about what you don't understand about the problem.*
I think there is no problem with what you have done so far. We could use Theorem ____ now because ____. *Provides helpful complete or partial answer.*	This problem was easy. Try again. *If it is easy for you, explain how to start.*
I used ____ to [detailed description here]. *If you are able to provide a detailed description of how you applied what you learned, it is a substantial contribution.*	We can use determinant of a matrix to find volume of parallelepiped. *This is already stated in the textbook. This is not a contribution.*

Student Conduct and Communication Policy: You are expected to abide by the GMU Student Code of Conduct: `https://studentconduct.gmu.edu/university-policies/code-of-student-conduct/`. You must be respectful of everyone in the course and use civil communication.

Accessibility: Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit `http://ds.gmu.edu/` for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: `ods@gmu.edu` | Phone: (703) 993-2474

Technical Assistance: You have free technical support as a GMU student. For technical assistance (non-MyLab), please visit `https://its.gmu.edu/service/its-support-center/`. Please contact tech support for technical difficulties as I am not able to provide technical support. However, please let me know if there is any extended technical problem that you run into.

MyLab Technical Support: If you run into any problems with the MyLab system, contact Pearson https://support.pearson.com/getsupport/s/students as soon as possible. Because we are using this system for the weekly homework, it is very important to seek to resolve all technical problems in a timely manner. I am not able to provide technical support for the Mylab system, but please do let me know of any extended problem.

Math Tutoring Center: You can get free tutoring for this class online from the Math Tutoring Center https://science.gmu.edu/academics/departments-units/mathematical-sciences/math-tutoring/tutoring-center-hours-and. Do not hesitate to utilize this additional help that is available to you!

University Honor Code: You are expected to follow the GMU Honor Code https://oai.gmu.edu/mason-honor-code/. In this class,

- You are allowed to discuss homework problems with each other and myself in the course discussion board in Blackboard, use the GMU math tutoring center, or send me an email.
- The quizzes and exams are open source but you are expected to work all quiz and exam problems independently by yourself without the aid of any other person (person includes online tutoring sites and Q&A forums). If you don't understand the wording of the question or think there is a typo, you ask me.
- Discussion posts are written/typed by yourself and proper reference is given where appropriate. You will not post quiz or exam questions in the discussion forum.

Important Dates: See https://registrar.gmu.edu/calendars/summer-2021/ for all important dates relevant to the Summer 2021 B Session.

- Last day to drop with no tuition liability: **June 3, 2021**
- Last day to drop with 50% tuition liability: **June 9, 2021**
- Unrestricted Withdrawal Period (100% tuition liability): **June 10 - June 17, 2021**
- Selective Withdrawal Period (100% tuition liability): **June 18 - July 6, 2021**

Schedule of Topics

Week/Dates	Topics
Week 1 (6/1 - 6/5)	Section 1.1 - Systems of Linear Equations Section 1.2 - Row Reduction and Echelon Forms Section 1.3 - Vector Equations Section 1.4 - The Matrix Equation Ax = b Section 1.5 - Solution Sets of Linear Systems
Week 2 (6/6 - 6/12)	Section 1.6 - Applications of Linear Systems Section 1.7 - Linear Independence Section 1.8 - Introduction to Linear Transformations Section 1.9 - The Matrix of a Linear Transformation Section 2.1 - Matrix Operations
Week 3 (6/13 - 6/19)	Section 2.2 - The Inverse of a Matrix Section 2.3 - Characterizations of Invertible Matrices Section 3.1 - Introduction to Determinants Section 3.2 - Properties of Determinants Section 3.3 - Cramer's Rule, Volume, and Linear Transformations
Week 4 (6/20 - 6/26)	Section 4.1 - Vector Spaces and Subspaces Section 4.2 - Null Spaces, Column Spaces, Row Spaces, and Linear Transformations Section 4.3 - Linearly Independent Sets; Bases
Week 5 (6/27 - 7/3)	Section 4.4 - Coordinate Systems Section 4.5 - The Dimension of a Vector Space Section 4.6 - Change of Basis Section 5.1 - Eigenvectors and Eigenvalues
Week 6 (7/4 - 7/10)	Section 5.2 - The Characteristic Equation Section 5.3 - Diagonalization Section 5.4 - Eigenvectors and Linear Transformations Section 5.6 - Discrete Dynamical Systems
Week 7 (7/11 - 7/17)	Section 6.1 - Inner Product, Length, and Orthogonality Section 6.2 - Orthogonal Sets Section 6.3 - Orthogonal Projections Section 6.4 - The Gram-Schmidt Process Section 6.5 - Least-Squares Problems
Week 8 (7/18 - 7/23)	Review and Final Exam

Note: Please note that some part of the syllabus may be changed during the semester at my discretion due to time constraints and unforeseen circumstances. Any change to this syllabus will be announced via Blackboard announcement.