MA 322-002 SYLLABUS

Contact Information

Instructor: Dr. David Mehrle (rhymes with "early")
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Office: Patterson Office Tower 829\
Office Hours: To be announced

Coordinates

Meeting time: MWF 11:00 am - 11:50 am
Location: Whitehall Classroom Building 214

Policies and Expectations

About this class

MA 322 is an introduction to linear algebra and matrix theory. The course covers topics: matrices, vector spaces, linear equations, eigenvalues, eigenvectors, determinants, diagonalization, and orthogonal projections corresponding to chapters 1-6 of the textbook (which you are not required to buy).

Learning Objectives

By the end of the course, you should be able to do the following.
- Use algorithms (by hand) to:
    - solve systems of linear equations;
    - compute inverses to linear transformations;
    - compute eigenvalues and eigenvectors;
    - compute determinants;
    - find an orthonormal basis for a real vector space using the Gram-Schmidt process.
- Perform algebra with matrices and vectors, including:
    - addition, multiplication, scaling, and taking inverses of matrices;
    - calculating angles and distances between vectors in $\mathbb{R}^n$;
    - project vectors onto subspaces of $\mathbb{R}^n$.
- Determine if a subset of $\mathbb{R}^n$ is a subspace, and if it is, compute a basis and determine its dimension.
- Define an abstract vector space and give examples.
- Determine if a given set of vectors is spanning, linearly independent, and/or a basis for a vector space.

Expectations

I expect that you will:
- attend every class;
- behave in a manner conducive to an atmosphere of learning. This includes (but is not limited to) being courteous and respectful to yourself, other students and the instructor, being an active participant in class activities, arriving to class on time, and refraining from any behavior that may distract or disturb other students;
- abide by the [academic policies of the Universtiy of Kentucky](#) and the [rules regarding academic offenses.](#).

Getting Help

I am here to help you learn, but I need to know when you need help. Please come talk to me as soon as you feel like you're having trouble in the course. It will be a lot easier for you to catch up if you are proactive in contacting me and honest in your understanding of the material. Please also know that you are not alone! Your classmates are excellent resources and I encourage you to work together. See also [Resources Available to Students](#).

Technology Requirements

I expect you to be familiar with canvas. You will be asked to upload all of your written work to canvas in this class, and you will be asked to upload exams to canvas during class. You are required to have the necessary technology to log onto canvas and upload papers, and you must be able to independently overcome any technological hiccups that may arise during this process.

Academic Integrity

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

Disabilities

Students with disabilities who require accommodations to participate in this class are asked to notify me as soon as possible and to provide me with a Letter of Accommodation from the

[Disability Resource Center](#) (drc@uky.edu or 859-257-2754). Letters must be received at least one week prior to the requested accommodation.

If you suspect that you may have an undiagnosed/undocumented learning disability, the [UK Counseling Center](#) may be able to help.

Diversity, Equity, and Inclusion

I believe that:
- Every student deserves to be treated with dignity and respect.
- Your ability to do mathematics is entirely unrelated to your worth as a human being.
- Mathematical potential is distributed equally among different groups, irrespective of geographic, demographic, and economic boundaries.
- Everyone can have joyful, meaningful, and empowering mathematical experiences.
- Grades are not a judgement of you as a person, but a snapshot of your performance at a particular moment. They are unfortunate realities of the system we work in. You should use them to inform your learning, but do not let them hinder it.

These were inspired in part by the four axioms of [Frederico Ardilla](#).

If at any point you feel unwelcome or uncomfortable in this class, please reach out to me immediately so I can change what I am doing or can intercede with a classmate on your behalf. Here is [the official policy of the University of Kentucky on inclusion](#).

Textbook

We will cover the first six chapters of ``Linear Algebra and Its Applications'' by David C. Lay, Steven R. Lay, and Judi J. McDonald. You may use any edition of the book (earlier editions may have fewer authors).

You are not required to own a copy of the textbook for this course. However, all students have been automatically enrolled in the FirstDay e-text program, which will charge you $35 for an online version of the textbook unless you opt-out by September 6th! To opt out, simply click on the FirstDay Course Materials link in the sidebar and choose "opt out."

That being said, the textbook is full of good practice problems, and $35 is a reasonable price if you can stand the online version. A used print copy of the textbook is about $70, but older editions are probably cheaper. You may also be able to find other versions of the book online.

How you will be graded

Deadlines

Due dates and exam dates appear in the [course calendar](#). Any requests for homework extensions due to University-excused absences must be received at least 24 hours prior to the scheduled due date.

Online Homework (WeBWork)

Most of your homework will be done through the [online WeBWork system](#), which you can access through canvas. You should expect about three WeBWork assignments per week. The purpose of these assignments is to make sure you practice regularly and keep up with the class. Note that WeBWork assignments and their due dates are listed on Canvas, but your scores on WeBWork assignments will only appear on the WeBWork system and not on Canvas.

Written Homework

In most weeks, written homework will be assigned and is due on Wednesdays at 8pm (see course calendar). In order to receive credit, solutions must be neatly written (or typed) and uploaded as a single pdf file to Canvas. You may write your solutions on a tablet and upload directly from there, or you may write your solutions on paper and upload a scanned version. Make sure to produce a scan that only shows the paper (neatly aligned) and not the table surface or any accessories. Late submissions will not be accepted unless the delay is due to an excused absence. Your lowest two homework assignments will be dropped from your final grade at the end of the semester.

Quizzes

There will be a weekly 15-minute quiz on Fridays, except for exam weeks; see course calendar. The quizzes will be administered through canvas and will involve true/false questions, multiple choice questions, and questions where you have to enter a numerical answer. The quizzes are available between 11:50am (the end of class) and 8pm, and they will close 15 minutes after you opened them (8pm at the latest). Each quiz is worth 4 points. Your lowest two quiz scores will be dropped from your final grade at the end of the semester.

Tests

There will be four tests during the semester; the dates are in the course calendar. Tests will be given in class, on paper. You may not use a calculator during tests. You will be expected to scan and upload your test as a single PDF file to Canvas at the end of the class period during which the test takes place. Your lowest test score will be dropped from your final grade at the end of the semester.

Final Exam

There will be a final exam on December 14 from 8am to 10am. You may not use a calculator during the final exam. You will be expected to scan and upload your final exam as a single PDF file to canvas at the end of the exam period.

Grades

There are 500 possible points in this course, broken down as in the table below.

Assignment Category	Points Possible	
Online Homework	70	
Written Homework	100	(12 homeworks × 10 points each; two dropped)
Quizzes	80	(10 quizzes × 10 points each; two dropped)
Tests	150	(4 Tests × 50 points each; one dropped)
Final Exam	100	
TOTAL	500	

Your final grade will be determined based on your point total out of 500, as displayed in the table below. The letter grade cutoffs in this table will be used as a guideline; they will not be raised by they may be lowered.

Letter Grade	A	B	C	D	F
Points Interval	[450,500]	[400, 450)	[350,400)	[300,350)	[0,300)

Course Calendar

- WebWork is due at 11:59 pm, and solutions will appear later on the next day.
- The written homework (WH) is due by Canvas upload at 8:00pm on the day listed below.
- 15-minute timed quizzes will be available on Canvas from 11:50am (the end of class) to 8pm on the same day.
- Exams will be given in class and will be uploaded to Canvas (by you!) at the end of the class in which they are given.

Week	Date	Material	WebWork Due	Written Homework Due	Quizzes
	Aug 22	Intro & 1.1			
1	Aug 24	1.1 & 1.2			
	Aug 26	1.2	WW1.1		Quiz 1
	Aug 29	1.3	WW1.2		
2	Aug 31	1.4	WW1.3	HW 01	
	Sep 2	1.5	WW1.4		Quiz 2
	Sep 5	Labor Day			
3	Sep 7	1.7	WW1.5	HW 02	
	Sep 9	1.8	WW1.7		Quiz 3
	Sep 12	1.9	WW1.8		
4	Sep 14	2.1	WW1.9	HW 03	
	Sep 16	Exam 1			
	Sep 19	2.1	WW2.1		
5	Sep 21	2.2	WW2.2	HW 04	
	Sep 23	2.3 & 3.1	WW2.3		Quiz 4
	Sep 26	3.2	WW3.1		
6	Sep 28	3.3	WW3.2	HW 05	
	Sep 30	2.8/4.1	WW3.3		Quiz 5
	Oct 3	4.1			
7	Oct 5	4.1	WW4.1	HW 06	
	Oct 7	Exam 2			
	Oct 10	4.2			
8	Oct 12	4.3	WW4.2	HW 07	
	Oct 14	2.9/4.5			Quiz 6
	Oct 17	4.5	WW4.3		
9	Oct 19	4.5		HW 08	
	Oct 21	4.4	WW4.5-4.6		Quiz 7
	Oct 24	Fall Break			
10	Oct 26	4.4	WW4.4	HW 09	
	Oct 28	Review			
	Oct 31	Exam 3			

11	Nov 2	5.1			
	Nov 4	5.2	WW5.1		Quiz 8
	Nov 7	5.3	WW5.2		
12	Nov 9	5.4	WW5.3	HW 10	
	Nov 11	6.1	WW5.4		Quiz 9
	Nov 14	6.2	WW6.1		
13	Nov 16	6.3	WW6.2	HW 11	
	Nov 18	Exam 4			
	Nov 21	6.4	WW6.3		
14	Nov 23	Thanksgiving			
	Nov 25	Thanksgiving			
	Nov 28	6.4			
15	Nov 30	6.5	WW6.4	HW 12	
	Dec 2	6.6	WW6.5		Quiz 10
	Dec 5	Review			
16	Dec 7	Review			
FINALS	Dec 14 (8-10 am)	Final Exam			

The instructor reserves the right to modify this syllabus at any time with proper notice.