Math 224 Syllabus

Course Information

Course number	MATH 224
Course title	Linear Algebra
Course location	RBH 311
Course meeting times	Tuesday and Thursday 2:40-4:00
Textbook	John B. Fraleigh and Raymond A. Beauregard, *Linear Algebra*, 3rd edition
Course web page	http://www2.kenyon.edu/Depts/Math/Paquin/math224.html

Contact Information

Professor	Dana Paquin
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Office Hours

Monday	1:00-3:00
Wednesday	2:00-4:00
Thursday	4:00-5:00

Additional times by appointment!

If you are unable to meet with me during the times listed above, please feel free to **set up additional times by appointment**. I encourage you to attend office hours as much as possible, even if you are not having trouble with the mathematical material. Office hours serve as an opportunity for me to get to know you, for you to get to know me, for you to ask me questions, and for you to work with me and other students on problem sets. Seeing and understanding multiple solutions and/or approaches to the same problem is an important mathematical skill, and one that can be developed through interactions during office hours.

Homework

The best way to learn mathematics is by doing mathematics; thus, homework will be assigned daily. Homework to be graded will be collected weekly, typically on Tuesdays. Homework is due at the **beginning of class** on the assigned due date, unless I specify otherwise. Late homework will NOT be accepted. If you know you will be missing class for some reason, turn in your assignment BEFORE you leave. Extensions may be granted for extenuating circumstances, but these must be discussed with me as early as possible.

Although you are encouraged to work with other students on homework problems, you must write up your final solutions on your own, as the homework is intended to be preparation for the quizzes and exams.

The homework may involve computer exercises as well as hand-written computations and explanations. Your homework must be legible, and your explanations must be clear. When possible and appropriate, write your explanations in complete sentences using correct mathematical and English grammar. Random expressions floating in space will receive no credit. It is your job to explain your solution to the reader, not the reader's job to search for a right idea buried in what you have written. Illegible homework will not be read or graded.

In addition to the homework that will be graded and collected, I will often suggest additional problems for you to work on, especially in the beginning of the semester when a significant amount of drill work is necessary to master the new definitions and concepts. Although this homework will not be graded or collected, I strongly encourage you to solve the suggested problems. You should not worry about formally writing up solutions to the suggested problems; rather, just make sure that you are able to solve them and that you understand the underlying concepts. Note that you should also be reading the textbook sections as you do the daily homework–the examples are a great help.

Homework assignments will be posted online (at least one week in advance) on the Math 224 Homework page (accessible through the Math 224 homepage).

Daily Reading and Objectives

Reading the textbook before each course meeting is a necessity. Come to class prepared with questions and comments for discussion. Make sure that you read and *understand* the examples presented in the textbook. Although there will not be enough time to cover all of the material in a given section during class, you will still be responsible for the material (unless I specify otherwise). In particular, you are responsible for all of the material specified on the Daily Objectives files posted on the Math 224 Daily Objectives page. I will also post relevant notes, examples, and Maple worksheets on the Math 224 Objectives page.

Software

There will be a considerable amount of work done (both in class and outside of class) with the aid of the computer algebra system (CAS) *Maple*. *Maple* is available in Peirce 001, RBH 203, and in RBH 311 (evenings only). Please contact me if you prefer to use another CAS (such as MATLAB or Mathematica).

Assessment

Your grade in this course will be based on the following components:

Homework	15%
Quizzes	5%
Writing Project	10%
Exam 1	15%
Exam 3	15%
Exam 3	15%
Final Exam	25%

Quizzes

On most Thursdays, there will be a short quiz consisting of a few problems taken from unassigned exercises from the textbook. The problems will be from the sections presented in the previous week. Your lowest quiz grade will be dropped. Quizzes and their solutions will be posted on the Math 224 Quizzes page (accessible through the Math 224 homepage).

Exams

There will be three in-class exams and a comprehensive final exam in this course. The exam dates are as follows:

Exam 1	Thursday, September 27
Exam 2	Thursday, November 1
Exam 3	Thursday, December 6
Final Exam	Monday, December 17 1:30-4:30 pm.

Note that the final exam will be **three hours** in length. More information about the exams can be found on the Math 224 Exam Information page (accessible through the Math 224 homepage).

Writing Project

The ability to express your thoughts coherently and concisely in writing is an important mathematical tool (and, indeed, an important part of the liberal arts education experience at Kenyon). During the semester, you will be asked to write a 5-10 page paper on a topic relevant to Linear Algebra. Possible paper topics include:

- An application of linear algebra
- A theoretical aspect of linear algebra not covered in this course
- The historical development of linear algebra

Projects are due on Friday, November 16 at 5:00 pm. Note that this is the Friday before Thanksgiving break, so if you are planning to leave early for break, please make sure to turn in your project BEFORE you leave. More information about the writing project can be found on the Math 224 Writing Project page (accessible through the Math 224 homepage). As the semester progresses, I will post possible topics and resources for the writing project. I strongly encourage you to think about and decide on a project topic as early as possible, but you should decide on a topic (and discuss it with me) by the end of October. Your project will be graded on how well you cover your topic, including writing style. You must reference all sources.

Learning Disabilities

If you have a disability which requires an accommodation in this class, please discuss your concerns with me, but you should also consult Ms. Erin Salva, (Coordinator of Disability Services; Office of the Dean for Academic Advising, PBX 5453) as soon as possible. Ms. Salva (in consultation with the L.E.A.R.N. committee) has the authority and the expertise to decide on the accommodations that are proper for your disability. Though I am happy to help you in any way I can, I cannot make any accommodations for learning (or other) disabilities without proper authorization from Ms. Salva.

Academic Honesty

In general, the rules set forth in the 2007-2008 Course of Study apply. Presenting the work of others as your own is strictly prohibited. In the case of homework, you may collaborate with others in discussing how a problem may be solved, but the work you turn in must be your own. If you submit work that contains the ideas or words of someone else, then you must provide proper citation. Assistance can not be given or received on any quiz or exam associated with this course, unless explicitly stated otherwise. Audio or video recording of class sessions is not permitted.

Course Schedule

This schedule may be adjusted as necessary.

Class	Date	Topic
1	28 Aug	1.1: Vectors 1.2: The Norm and the Dot Product
2	30 Aug	1.3: Matrices 1.4: Solving Systems of Linear Equations
3	4 Sep	1.5: Inverses 1.6: Homogeneous Systems, Subspaces, and Bases
4	6 Sep	1.7: Applications to Population Distribution
5	11 Sep	2.1: Independence and Dimension
6	13 Sep	2.2: Rank
7	18 Sep	2.3: Linear Transformations
8	20 Sep	2.4: Linear Transformations
9	25 Sep	Review
10	27 Sep	**Exam 1**
11	2 Oct	3.1: Vector Spaces 3.2: Vector Spaces
12	4 Oct	3.3: Coordinization of Vectors
	9 Oct	No class: October reading days
13	11 Oct	3.4: Linear Transformations
14	16 Oct	4.1: Areas, Volumes, and Cross Products 4.2: The Determinant of a Square Matrix
15	18 Oct	4.3: Computation of Determinants 4.4: Linear Transformations and Determinants
16	23 Oct	5.1: Eigenvalues and Eigenvectors
17	25 Oct	5.2: Diagonalization
18	30 Oct	Review
19	1 Nov	**Exam 2**
20	6 Nov	5.3: Applications of Eigenvalues
21	8 Nov	6.1: Projections
22	13 Nov	6.2: The Gram-Schmidt Process
23	15 Nov	6.3: Orthogonal Matrices
	16 Nov	**Writing Project due at 5 pm**
	20 Nov	No class: Thanksgiving holiday
	22 Nov	No class: Thanksgiving holiday
24	27 Nov	7.1: Change of Basis
25	29 Nov	7.2: Matrix Representations and Similarity
26	4 Dec	Review
27	6 Dec	**Exam 3**
28	11 Dec	Selected topics, exam review
	17 Dec	Final Exam, 1:30-4:30 pm