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Syllabus for MA 322-005 Fall 2011

MA322-005 (201) Fall 2010: Eakin

Ma322-005 is an introduction to linear algebra and the theory of matrices. Prerequisites are the mathematical maturity represented by success completion of two semesters of calculus or the completion of the first and concurrent enrollment in the second.

Here is summary of instructor contact information as well as times and locations of class meetings and the like, as of the first day of

MA 322-005	
Instructor	Dr. Paul Eakin, Professor of Mathematics
Office	777 P.O.T.
Phone	257-6798 or 323-2849
E-Mail	paul@ms.uky.edu
Office Hours	11:00-12 M and by appointment.
Mathskeller Hours	3:00-4:00 MW
Class	5:00-6:30 MW in CB 335

Daily Lecture Notes and other Supplemental Materials

Generalities: The formal course prerequisites are two semesters of calculus. The second may be taken concurrently.

Credit: This course carries three (3) semester hours credit.

Textbook: The textbook is *Linear Algebra and Its Applications (Third edition)*, Pearson, by David Lay.

The text is an important course resource but the homework problems are in the homework system and are not assigned from the text; are using edition 3 because it is the one in print. The arrangement of the problems tends to be the major differences among editions text so if you have access to an inexpensive copy of an earlier edition then it, the course notes, and class discussion will serve well for the course. Used copies of the second edition were recently available on Amazon.com for \$20 or less.

Homework: This course uses a UK-developed, web-based homework system called WHS which is accessed via the URL www.mathcla.org. Students use the system to obtain homework assignments as well submit them for immediate grading. The system is also used in communicating with their instructors and for tracking their progress in the class.

Each student has a personal version of each assignment which must be completed before the assignment deadline. If you submit an answer, you are allowed to submit again (as many times as needed) until you have the correct answer or the assignment deadline has passed. There is no penalty for submitting an incorrect answer. **Students are permitted and, in fact, encouraged to work together on homework problems. Submissions of homework versions other than the student's personal version receive no credit. Submissions after the deadline (midnight of the due date) receive no credit.**

Homework credit: The homework counts for 80 of the 500 possible course points. If N is the total number of homework problems assigned in the course and C is the number for which credit is earned then:

Homework points = $\lceil 80 * C / N \rceil$ Here " $\lceil \cdot \rceil$ " means the nearest integer. $\lceil 79.49 \rceil = 79$, $\lceil 79.51 \rceil = 80$. The convention is that .5 "nearer" to 1 than 0 so $\lceil 79.5 \rceil = 80$.

Examinations: Examinations count 300 of the 500 course points. As noted in the table above, there will be two mid-term exams and one final exam. Each of the examinations will be focused primarily on the material from the lectures and homework from the corresponding exam period. However, students are responsible for all material covered up to that exam, including material from previous exam periods. **The final will be comprehensive.**

The exams are traditional, constructed response ("show/justify all your work") tests. They will be graded by the instructor whose primary concern will be the understanding of the course material communicated by the student's work. Students are both permitted and encouraged to use calculators on the examinations for routine arithmetic and built-in function evaluation. Sophisticated features may be used for things as gaining intuition about a problem or cross-checking answers. However, "answers" simply taken as output from calculator without explanation or justification, will generally not receive any credit.

The two mid-term exams will be during class time. The **exam schedule** is as follows.

Exam	Date	Time	Location
Exam 1	26 Sept	5:00	CB 335
Exam 2	19 Oct	5:00	CB 335
Final Exam	15 Dec	3:30	CB 335

Course progress can affect the appropriate timing of mid-term exams so deviations from the above, while very unlikely, are nevertheless possible. Any changes in the schedule will be announced no less than a week in advance of the affected exam. Any changes would have the effect of postponing an exam.

Exam scheduling conflicts:

If you are aware of needed individual arrangements for an examination then you must inform the instructor of the conflict and schedule an alternative at least two weeks in advance. The instructor can provide for alternate starting times for the exam and for extended time for students qualified for accommodation arrangements if he is made aware of these needs in advance. Emergency situations will be handled on an *ad hoc* basis.

Attendance and Participation:

Attendance/participation points counts 40 of the 500 course points. Each student is allowed two unexcused absences from lecture. Each unexcused absence beyond those two deducts three attendance points.

Attendance will be taken at each lecture. Expect to be asked for participation. Failure to participate when called upon will result in loss of attendance credit for the session.

Quizzes: Quizzes count 80 of the 500 course points. There will typically be at least one quiz per week. Quizzes will be scheduled at least a week in advance. The preliminary schedule of quizzes and exams is in the course calendar. Each quiz will be graded on a 100-point basis. The quiz average will be used to proportionally assign 100 points to the final grade. That is the quizzes collectively count as a mid-term exam.

Course Topics and Dates: The **Course Calendar**, below, lists the material to be covered, relevant homework assignments, and their due dates.

Note that this is subject to adjustment, depending on the progress of the course. The dates and times of the exams, are very unlikely to change but some adjustments to the quiz and homework schedules may occur.

Final Exam: The final examination is the third 100-point exam. It will be over all the material of the course.

Grades: As noted above there are a total of **500 points** to be earned in the course. The grading scale is:

A At least 90% or at least 450 points

B At least 80% or at least 400 points

C At least 70% or at least 350 points

D At least 60% or at least 300 points

E Below 60% (below 300 points)

Here is a summary of how the points are earned:

Exams and Final	300 points	60 % of course grade
Quizzes	80 points	16 % of course grade
Online homework	80 points	16% of course grade
Attendance and participation	40 points	8% of course grade
Total	500 points	100% of course grade

Note Well: The final grade is a course grade - **not a test grade**. The homework, quiz, and attendance/participation grades together are equivalent to two exams and they will be counted. In the extreme it is true that 100% on the quizzes and 0% on each of the other components would result in a course average of 60% which is the lowest possible "D".

Cheating Collaboration on, or receiving assistance on the online homework is specifically permitted and is **not** considered cheating.

With this explicit exception, any representation of the work of others as your own in order to gain academic credit or advantage is prohibited. Individuals caught cheating will immediately be assigned failing grades on the assignment and will be reported to the proper university administrators. Refer to <http://www.uky.edu/Ombud/acadoffenses/> for a brief synopsis of the UK policy on academic offenses from the office of the Ombudsman and to page 167 of **UK Senate Rules** for the full details.

Use of Technology

A general scientific calculator will suffice for all homework and may be used on the examinations. However, examination answers that are simply calculator routines without explanation or justification will receive no credit.

The instructor will sometimes use the Maple problem solving language to illustrate course material and illustrate calculations. Students may learn about Maple as part of their course participation. Maple is installed in all university computing laboratories where it can be freely used. The student version can be purchased from Maplesoft at <https://webstore.maplesoft.com/catalog.aspx> (download) for \$99 and shipped CD for \$129. They offer many "student resources" that are probably not worth the expense given free resources as Professor Eberhart's free Maple handbooks and worksheets at <http://www.ms.uky.edu/~carr/>.

Use of Maple is not a required part of the course, the homework problems do not require Maple (a calculator will suffice), and nothing about Maple will appear on the examinations.

Calendar for Ma 322 Linear Algebra - Fall 2011 (This is subject to change depending on course progress.)			
Lecture	Lecture Schedule	Homework Due	Preliminary exam and quiz schedule
	(this is subject to change depending on course progress)		
24-Aug	1.1 -1.2 Systems, Row Reduction, Echelon Form		
25-Aug		00 (Check Browser)	
26-Aug			
29-Aug	1.2 Row Reduction and Echelon Form		Quiz1 (1.1)
30-Aug		A00 (Systems)	
31-Aug	1.3-5 Vector and Matrix Equations, Solutions to Linear Systems	A01 (Solutions I)	Quiz2 (1.2-3)
5-Sep	Labor Day - Academic Holiday		
6-Sept		A02 (Solutions II)	
7-Sep	1.5 Solutions to Linear Systems, 1.7 Linear Independence		Quiz3 (1.3-5)
11-Sept		A03 (Vector Eqns)	
12-Sep1	1.7 Linear Independence, 1.8 Linear Transformations		Quiz4(1.7)
14-Sep1	1.8-9 Linear Transformations, Matrix of a linear Transformation	A04 (AX=B)	Quiz5(1,8-9)
18-Sept		A05 (Linear Independence)	
19-Sep2	1.1-3 Matrix Algebra		
20-Sept			

		A06 (Linear Transformations)	
21-Sep	Review	Last day to withdraw	Quiz6(2.1-3)
26-Sep	EXAM 1 (In Class)	B01 (Matrix Algebra)	EXAM 1
28-Sep	3.1-3 Determinants		
2-Oct		B02 (Determinants)	
3-Oct	3.1-3 Determinants		Quiz7(3.1-3)
5-Oct	4.1-2 Vector Spaces	B03 (DeterminantsII)	
7-Oct			
10-Oct	4.1-2 Vector Spaces	C1 (Vectors I)	Quiz8(4.1)
12-Oct	5.1 Eigenvalues and Eigenvectors		
14-Oct			
17-Oct	Review	D1 (Eigenvalues I)	Quiz9(5.1-3)
19-Oct	EXAM II		EXAM 2
21-Oct			
24-Oct	5.2 Characteristic Eqn, 5.3 Diagonalization		
26-Oct	5.4 Eigenvectors and linear Transformations, 5.5 Complex Eigenvalues		Quiz10(5,2)
31-Oct	6.1-2 Inner Products, Length, Orthogonality, Orthogonal sets	D1	
2-Nov	6.3 Orthogonal projections		Quiz11(5.2-4)
3-Nov			
4-Nov			
7-Nov	6.4 Gram Schmidt Process, 6.5 Least Squares		
9-Nov	6.7 Inner product spaces		Quiz12(6.1-3)
11-Nov			
14-Nov	7.1 Diagonalization of Symmetric Matrices		
15-Nov			
16-Nov	7.2 Diagonalizing Inner products/Quadratic forms		Quiz13(7.1-2)
21-Nov	Diagonalization continued		
23-Nov	THANKSGIVING		
25-Nov	THANKSGIVING		
28-Nov	7.4 Singular Value Decomposition (course progress permitting)		
30-Nov	7.4 Singular Value Decomposition (course progress permitting)		Quiz14(7.4)
5-Dec	Review		
7-Dec	Review		
14-Dec			FINAL EXAM

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