

QUEEN'S UNIVERSITY AT KINGSTON
MATHEMATICS 111 SCHEDULE – FALL/WINTER 2008/09

INSTRUCTOR: Peter Taylor, Jeffery 513, 533-2434.
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LECTURES Slot 1, Walter Light 205

TEXT: Linear Algebra 2008-09—Notes sold at the Math Dept. Office Jeffery 3 for \$30 cash or cheque made out to Dept Math&Stats. Notes can be purchased **Tuesday Sept 9: 1-2** or **Thursday Sept 11: 11 – 12**. These will come to you as loose-leaf pages 3-hole punched. This will allow you to insert additional handouts or your own notes at appropriate places. There are just over 300 pages. You can buy a large 3-ring binder to hold them all or put them on a shelf at home and bring the current chapter to class in a smaller binder.

PREREQUISITES. What's important is not so much what you've learned, but how good a learner you are. You definitely need a solid grounding in high school algebra. It helps if you've worked a bit with vectors and matrices, but that's not essential. We'll start all that from the beginning.

COURSE WEB PAGE. <http://www.mast.queensu.ca/~math111/>
Assignments, solutions, test preparation etc. will appear here.

HELP!

webCT is a good place to post questions. A fellow student or a tutor will likely give you a quick answer. This has been shown to work well in the past.

Tutorials are held in weeks in which there is an assignment due or a midterm test: Times and tutor TBA.
The Math Help Centre, Jeff 201 is staffed most of the time and 111 help is available there also.

You are urged not to miss lectures—many of the application will be difficult to understand or master without the experience of the classroom. Even more—the class is more than a collection of individual learners; it is a community which grows and develops throughout the year. If you're not there, the community is diminished. To help you appreciate this we will take attendance for the middle 10 weeks of each term. In 111A this will happen only in the Monday and Tuesday classes (Thursday is free and will not cover new work.) Attendance will count for 10 marks total (for 20 weeks).

There are a number of standard manipulations in the subject that are nicely done by computer. It will be useful for you to have a simple working knowledge of MAPLE, which is available on the machines in Jeffery Hall. Maple help notes are attached at the end of the textbook.

There will be 10 biweekly assignments, due every second Thursday in class, worth 2 marks each for an assignment mark of 20%. It turns out that a lot of good learning is done through discussing problems with others, so we encourage group work for these assignments (small groups, 2 or 3) and you need only submit one assignment per group with the names and student numbers clearly displayed on the front of the paper. But, of course, if you are part of a group, it is your responsibility to make sure that you understand everything that has been submitted under your name. Failure to do that endangers your performance on tests and exams. The assignments and solutions will be posted on the course web-page.

There will be two midterm tests administered in class and worth 10 marks apiece and a 3-hour mid-year exam in December worth 15 marks. The Final Exam will be worth 40 marks.

Summary of marks:	Attendance	10
	10 assignments:	20
	2 mid-term tests	20
	Mid-year exam	20
	Final Exam	40

Due dates for assignments: Term 1. Sept. 25, Oct. 9, 23, Nov. 6, 20.
Term 2. Jan. 22, Feb. 5, 26 Mar. 12, 26.

Midterm tests (in class). Term 1 Oct. 30
Term 2 Mar. 5

"Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability or health consideration that may require accommodations, please feel free to approach the instructor and/or the Accessibility Services Office as soon as possible. The Accessibility Services staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. The sooner you let us know your needs, the quicker we can assist you in achieving your learning goals in this course."

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week	Fall 2008	
1	introduction A1 Solving Equations	
2	1.1 Vectors (algebraic) 1.2 Vectors (geometric) 1.3 Matrix multiplication	
3	1.4 Matrix inverse 1.5 Linear independence	A1: 1.1 – 1.3, appendix 1
4	2.1 Counting trains 2.2 Trains formula	
5	A2 Induction 2.4 Eigenvalues and eigenvectors	A2: 1.4 – 1.5, 2.1 – 2.2
6	2.4 More eigenvalues and eigenvectors 2.5 Dynamical systems	
7	3.1 Population growth 3.2 Reproductive value	A3: 2.4 – 2.5, appendix 2
8	3.2 Reproductive value continued 3.3 A three-stage population	Midterm Exam (covers to end of week 6)
9	3.4 Brine tanks 3.5 Brine tanks – salt survival	A4: 3.1 – 3.4
10	3.6 Brine tanks – inhomogeneous 3.8 Building an economy	
11	4.1 Win or Lose 4.2 Snakes and Ladders	A5: 3.5 – 3.8
12	Review	

week	Winter 2009	
1	5.1 Lines and planes 5.2 Dot product	
2	5.3 Equation of a plane 5.4 Orthogonal decomposition & projection	
3	5.5 Approximate solutions 5.6 Reach against height	A6: 5.1 – 5.4
4	5.7 Regression 5.8 Estimating population parameters	
5	5.9 The hat problem	A7: 5.5 – 5.8
6	5.10 Error-correcting codes	
Reading week		
7	6.1 Linear transformations in the plane 6.2 Linearity plus!	A8: 5.9 – 5.10
8	6.2 Linearity plus! 6.3 Affine combinations 6.4 Affine transformations	Midterm Exam covers up to 6.1
9	6.4 Affine transformations 6.5 Decomposition theorem	A9: 6.1 – 6.4
10	6.6 Transforming shape	
11	6.7 Iterated function systems	A10: 6.5 – 6.7
12	Review	