Department of Mathematics
MATH 1300
Vector Geometry and Linear Algebra
September - December 2011

SECTIONS (TIMES/LOCATIONS and INSTRUCTORS):
A01 – MWF – 9:30-10:20 – 408 Tier – P.N. Shivakumar
A02 – TR – 8:30-9:45 – 223 Wallace – Yang Zhang
A03 – MWF – 11:30-12:20 – 201 Armes – N. Zorboska
A04 – TR – 11:30-12:45 – 204 Armes – C.K. Gupta
A05 – MWF – 15:30-16:20 – 208 Armes – G.I. Moghaddam
A06 – W – 19:00-22:00 – 208 Armes – J. Arino

INSTRUCTORS:
Office hours will be announced in class by each instructor. If no phone number is provided, then email is the preferred means of communication. When emailing an instructor, it is preferable to use your U of M email and it is useful to include a tag such as [MATH 1300] in the subject line.

J. Arino – 436 Machray Hall – Julien_Arino@umanitoba.ca (Course coordinator)
C.K. Gupta – 432 Machray Hall – (204) 474-9376 – cgupta@cc.umanitoba.ca
G.I. Moghaddam – 429 Machray Hall – (204) 474-6849 – moghadm@cc.umanitoba.ca
P.N. Shivakumar – 522 Machray Hall – (204) 474-7477 – shivaku@cc.umanitoba.ca
Yang Zhang – 433 Machray Hall – (204) 480-1241 – zhang39@cc.umanitoba.ca
N. Zorboska – 530 Machray Hall – (204) 474-9832 – zorbosk@cc.umanitoba.ca

TEXT: Selected Chapters from Elementary Linear Algebra (Ninth Edition) by Anton

COURSE OUTLINE:

Systems of linear equations and matrices: Gaussian elimination, matrix operations, inverses, elementary matrices, and classes of matrices. **(Sections 1.1 – 1.7)**

Determinants: co-factor expansion; evaluating by row reduction, properties, Cramer's rule. **(Sections 2.1 – 2.3)**

Vectors and geometry in the plane R^2 and in the space R^3 : norm of a vector, vector operations, dot product, projections, cross product, lines and planes in R^3 , Euclidean *n*-space. **(Sections 3.1 – 3.5, Section 4.1)**

General vector spaces: real vector spaces, subspaces, linear independence, basis and dimension, row and column spaces, null space. **(Sections 5.1 – 5.5)**

CLASSES AND TUTORIALS:
You must register in and attend one of the tutorial sections associated with your lecture.
There are three things you must do to succeed in this course:

- Attend lectures, where theory will be explained and examples calculated.
- Attend your tutorial, where a teaching assistant will present additional examples.
- Study the text and do *at least* the suggested homework questions.

The tutorials (labs) begin on Thursday, September 15, 2011. Five quizzes will be given during tutorials. The dates at which these quizzes will take place will be announced in class by your instructor.

WEB SITE:
http://www.math.umanitoba.ca/undergrad_info/show_course.php?name=MATH_1300
On this page, you will find old midterms and final examinations, as well as additional information related to the course. Note that past examinations are provided for practice only: there is no guarantee that your examinations will in any way mimic them.

MATH 1300 WIKI:
A wiki is available for MATH 1300 at http://wikitest.cs.umanitoba.ca/mathwiki/. It is still under development, so the textbook remains the authoritative source of information for the course, but you are encouraged to use the wiki as a complement. Comments/suggestions about the wiki are welcome and should be sent to the course coordinator (J. Arino) with the tag [MATH 1300 wiki] in the subject.

MATHEMATICS HELP CENTRE:
A mathematics Help Centre operates during the term. For information on location, operating times, etc., see http://www.math.umanitoba.ca/undergrad_info/help_centre

MIDTERM TEST: There will be a one-hour midterm test, which will be held on **Thursday, October 27, 2011, 5:30-6:30 p.m.** No make-ups or deferrals are permitted except for reasons the University normally finds acceptable for absence from a final exam.

GRADING: There will be a two-hour final exam during the regular exam period in **December.** Your final grade will be based on 15% tutorial tests (best of 4 out of 5, **no deferrals allowed for any reason),** 35% midterm, and 50% final.

The **Voluntary Withdrawal** deadline is **Wednesday, November 16, 2011**.

EXERCISES: In order to learn the material of the course you will have to do a great deal of practice. Every student should work through the assigned problems in the exercises.

CALCULATORS: Calculators are **not** permitted for any of the quizzes, tests or exams.

STATEMENT on ACADEMIC DISHONESTY:
The Department of Mathematics, the Faculty of Science and The University of Manitoba regard acts of academic dishonesty in quizzes, tests, examinations, laboratory reports or assignments as serious offences and may assess a variety of penalties depending on the nature of the offence.

Acts of academic dishonesty include, but are not limited to bringing unauthorized materials into a test or exam, copying from another individual, using answers provided by tutors, plagiarism, and examination personation.

Note: cell phones, pagers, PDAs, MP3 units or electronic translators are explicitly listed as unauthorized materials, and must not be present during tests or examinations.

Penalties that may apply, as provided for under the University of Manitoba's Student Discipline By-Law, range from a grade of zero for the assignment or examination, failure in the course, to expulsion from the University. The Student Discipline By-Law may be accessed at:

http://umanitoba.ca/admin/governance/governing_documents/students/868.htm

Suggested minimum penalties assessed by the Faculty of Science for acts of academic dishonesty are available on the Faculty of Science web-page:

http://umanitoba.ca/faculties/science/resources/Discipline__Penalties_Table_Jul09.pdf

All Faculty members (and their teaching assistants) have been instructed to be vigilant and report all incidents of academic dishonesty to the Head of the Department.

SUGGESTED HOMEWORK QUESTIONS

Section	Pages	Exercises
1.1	6-8	1-11 odd, 14
1.2	19-23	1-14 even, 17-19, 22, 26, 27, 31, 32
1.3	34-38	1-6, 12-14, 18, 21, 29, 32
1.4	48-51	3, 4, 7, 8, 12, 14, 17, 20, 21, 29, 31, 35, 36
1.5	57-60	1-3, 6-8, 10, 13, 17, 22, 23
1.6	66-68	1-6, 9, 12, 17, 21-23, 27, 29
1.7	73-76	1, 3, 7, 10, 15, 19, 30
2.1	94-96	1, 2, 5, 7, 10, 13, 16-19, 27, 27, 35
2.2	101-103	1-5, 12, 19
2.3	109-111	1-4, 6, 9, 12, 20, 22
3.1	130-131	1(a)-(c), 2(a)(b)(g)(i), 3(a)(b)(f), 4, 6, 10, 11, 21
3.2	134-135	1(a)(b)(d)(e), 2(a)(c), 3, 6, 7, 11, 16
3.3	142-144	1(a)(c)-6(a)(c), 8-10, 12, 13, 16, 17, 25, 27, 31
3.4	153-155	1-4, 8-10, 12, 15, 17, 21, 24, 37
3.5	162-165	1-41 (odd), 47, 48, 51, 52
4.1	178-180	1, 2, 4, 6, 9, 11, 14, 16, 20
5.1	226-229	1-17 (odd), 18, 27, 28, 31
5.2	238-240	1-3, 5(b)(d), 6(a)-(c), 7, 9(a)(b)-11(a)(b), 13, 14, 16, 24, 25
5.3	248-250	1, 2(a)(b)-4(a)(b), 6(a), 7, 9, 12, 15, 19, 24
5.4	263-265	1-3, 4(a)(b), 5, 7, 10, 13, 18, 20, 22, 32, 36
5.5	276-278	1, 4, 6(a)-(c), 7(a)(b)-9(a)(b), 11, 13, 16

Solutions to some of these questions can be found in *Selected Chapters from Anton: Student Solution Manual to accompany Elementary Linear Algebra, 9th Edition* (bookstore).

Are You Well-Prepared for MATH 1300?
Our 50-question Diagnostic Test will tell you.

Information concerning the Mathematics Diagnostic Test and
Remedial Mathematics Program "Preparing for University Mathematics"

The Department of Mathematics has developed two new programs available ***on a voluntary basis*** to all students registered in Mathematics courses 1200, 1210, 1300, 1310, 1500, 1510, 1520, 1700, 1710 and 1690.

The diagnostic test is a voluntary online 50 question test, whose purpose is to measure your potential for success in the above Mathematics courses. The questions test your knowledge and skill in topics contained in the high school mathematics curriculum, principally Pre-Calculus 40S. The test provides you with an assessment of your knowledge and skill level, and provides advice about actions you should take in order to increase your chances of success in mathematical courses.

Access to the Mathematics Diagnostic Test is gained from your personal WebCT Homepage. (If you have not already done so, you must claim your UMnetID from the University's homepage at address "pasweb.cc.umanitoba.ca/webapp/gu/claimid/" in order to log on to your WebCT homepage.)

From your WebCT homepage select the link "Mathematics Diagnostic Test." Follow the instructions in order to complete the test, submit your test for grading, and immediately obtain results of your test. Finally, from your WebCT homepage, you should select the "Test Feedback" link, which will appear after you have submitted your test for grading. It will provide you with advice as how you should interpret the results of your test.

If your results on the diagnostic test indicate that you would benefit by improving your mathematical skills, you should purchase a copy of the notes prepared for this purpose, entitled "Preparing for University Mathematics." The notes are available at the Bookstore. There are two methods in which you could use these notes to improve your mathematical skills and knowledge:

1. Self-study: carefully work through those sections of the notes in which weaknesses have been identified by the diagnostic test,
2. Enroll in one of the sections of the non-credit course MATH 0500 "Preparing for University Mathematics": this course will be offered on Saturday mornings (9:00 am until noon) during the first half of the term. Enrollment in each section will be limited to 25 students. During these sessions a graduate student from the Department of Mathematics will serve as a tutor, helping you and the other students registered in that section work your way through the course material.

It is very important to note that in order for the remedial course to be of any benefit, students must complete it as thoroughly and as quickly as possible, whether it be done by self-study or tutor-guided study.