DEPARTMENT OF MATHEMATICS

MATH 2090 LINEAR ALGEBRA II

September – December 2015

A01:   **Instructor**:   G.I. Moghaddam, 426 Machray Hall, 204 474 8345, e-mail: moghadm@cc.umanitoba.ca

      Office hours: Monday and Thursday 12:00–1:00 PM, Tuesday 1:00–2:00 PM, or by appointment

      Lecture: 201 Armes, Slot 5, Tuesday and Thursday 10:00 – 11:15 AM

      Labs: B01 , 319 Allen Building, Friday 2:30 – 3:20 PM
                 B02 , 124 Machray Hall, Friday 8:30 – 9:20 AM
                 B03 , 124 Machray Hall, Friday 2:30 – 3:20 PM

Textbook: H. Anton and C. Rorres, **Elementary Linear Algebra Applications Version**
               (eleventh edition)

Course Outline:

1. **Vector Spaces:** Euclidean vector spaces, Real vector spaces, Finite dimensional vector spaces, subspaces, linear independence, basis and dimension, row space, column space and nullspace, rank and nullity

2. **Linear Transformations:** Kernel,range, inverse transformation, isomorphisms, matrices of general linear transformation, change of basis

3. **Eigen values and Eigen vectors:** Diagonalizibility of linear operators, powers of diagonalizable matrix, orthogonal diagonalization. Principle axis theorem. Normal, orthogonal and Hermitian matrices.

4. **Inner product spaces:** Orthogonal basis, Gram-Schmidt process, orthogonal diagonalizability

Most topics covered are in Chapters 4–8 of the text. Students are advised to do as many of the exercises (in assigned sections) as possible.

Course Webpage : http://home.cc.umanitoba.ca/∼moghadm/Math2090

Evaluation:

- **Quizzes:** There are three quizzes. Quizzes will be written in the lab and accounting for 15% of the final grade.

- **Midterm Exam:** A midterm exam, worth 30% of the final grade, will be conducted from 5:30 p.m. to 6:30 p.m. on

Thursday October 29.

- **Final exam:** A two and half hour final examination, to be scheduled by the Registrar's Office, will count for the remaining 55% of the final grade.

Calculators and/or reference material will NOT be allowed on tests or final examination.

Notes:

(1) If you miss a term test, you will be assigned a mark of "zero" unless reasons and acceptable supporting evidence are provided. Make-up tests will not be scheduled for missing tests.

(2)Students are advised to familiarize themselves with the General Academic Regulations of the University contained in the Undergraduate calendar. All forms of academic dishonesty are treated very seriously by the Department of Mathematics, and the Faculty of Science. Submitting another person's work as your own, copying from another person at an exam, or bringing unauthorized information into a test or examination is a serious offense. For further information, please see below.

(3) Voluntary Withdrawal Deadline is Wednesday **November 18**, 2015.

Academic Integrity

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.