DEPARTMENT OF MATHEMATICS

MATH 1210 Techniques of Classical and Linear Algebra

January – April 2020

A01:	**Instructor**:	Edward Timko , 450 Machray Hall, Tel: 204-474-7477 , e-mail: Edward.Timko@umanitoba.ca
	Lecture:	EITC E2 110, Slot 2, Monday, Wednesday, Friday 9:30 - 10:20 AM
	Office hours:	Monday, Wednesday and Friday 10:30 - 11:30 AM, or by appointment
A02:	**Instructor**:	Varvara Shepelska, 472 Machray Hall, Tel: 204-474-6920, e-mail: Varvara.Shepelska@umanitoba.ca
	Lecture:	Wallace 221, Slot 8, Monday, Wednesday, Friday 1:30 - 2:20 PM
	Office hours:	Monday 12:00–1:00 PM and Thursday 12:30–1:30 PM or by appointment
A03:	**Instructor**:	G.I. Moghaddam, 426 Machray Hall, Tel: 204-474-8345, e-mail: G.I.Moghaddam@umanitoba.ca
	Lecture:	Armes 201, Slot 7, Monday, Wednesday, Friday 12:30 - 1:20 PM
	Office hours:	Monday, Wednesday 11:00 AM - 12:00 PM and Friday 10:00 - 11:00 AM , or by appointment

Pre-Requisites: a minimum grade of 60% in Pre-calculus Mathematics 40S or the former Mathematics 40S (300), or a grade of "C" or better in the MSKL 100 offered by Extended Education.

Textbook: *Notes for Course MATH 1210: Techniques of Classical and Linear Algebra by Donald Trim (2012)*

Course Outline:

1. **Mathematical Induction:** In this unit proof by mathematical induction, and use of sigma notation to represent sums symbolically will be discussed (Chapter 1).
2. **Complex Numbers and Polynomial Equations:** This unit covers complex numbers in Cartesian, polar, and exponential forms, addition, subtraction, multiplication, division, and roots of complex numbers (chapter 2), properties of polynomial equations, and use the rational root theorem, Descartes' rules of signs, and a bounds theorem for finding roots of polynomial equations (Chapter 3).
3. **Linear Algebra:** This unit covers a variety of topics in linear algebra, such as matrices and matrix arithmetic (Chapter 4), vectors and their application to equations for lines and planes in three-space (Chapter 5), solving systems of linear equations by Gaussian and Gauss-Jordan elimination (Chapter 6), determinants, Cramer's Rule, linearly independent and dependent vectors (Chapter 7), inverses of matrices, using inverse matrices to solve linear system (Chapter 8), linear transformations, matrices for linear transformations and eigenvalues and eigenvectors (Chapter 9).

Course Webpage : http://home.cc.umanitoba.ca/∼moghadm/Math1210

Tutorials: There are several lab sections. You must be registered and attend in one of them (B01–B04 for A01, B05–B08 for A02, and B09–B12 for A03).

Student Evaluation:

- **Assignments:** There are three assignments accounting for 15% of the final grade.

- **Midterm exam:** A 75 minutes midterm examination, worth 30% of the final grade, will be conducted from 5:45 p.m. to 7:00 p.m. on

Monday March 9 .

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

Grading Table: The following is the grading table which may be adjusted downwards:

Letter Grade	Minimum percentage to guarantee	Final Grade Point
A+	92	4.5
A	83	4.0
B+	77	3.5
B	71	3.0
C+	65	2.5
C	60	2.0
D	50	1.0

Notes:

(1) Assignments will be posted on the course web page. Students have one week to work on each assignment and then submit it to the instructor by the end of the lecture on the due date. The schedule for assignments is as follows:

Assignment	Date to be posted	Due date
1	January 24	February 3
2	February 14	February 24
3	March 13	March 23

Marked assignments will be given back to the students, with mark and comments, in approximately 12 days after submission.

(2) There are no make-up assignments for missed assignments. In addition, late assignments are not accepted. You must attach a signed copy of "*honesty declaration*" to each assignment. Your assignment will not be accepted without it.

(3) If you miss the midterm exam, you will be assigned a mark of "zero" unless acceptable reasons and supporting evidence are provided. In that case you will be given the opportunity to write a make-up exam. Students missing the midterm must contact their instructor within 2 days of the scheduled midterm (email contact is sufficient).

(4) **Notes, books, calculators or other computing devices are not allowed for the midterm or the final exam.**

(5) Students are expected to attend all classes and labs and are responsible for all material presented in class even if they are not present.

(6) Students should not participate in personal direct electronic messaging / posting activities (e.g. e-mail, texting, video or voice chat, wikis, blogs, social networking), online and offline "gaming", or watching videos (e.g. Movies, Netflix, You Tube) during scheduled class time. If student is on call (emergency) the student should switch his/her cell phone to vibrate mode and leave the classroom before using it.

(7) The instructors and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission. Course materials (both paper and digital) are for the participant's private study and research.

(8) If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services http://umanitoba.ca/student/saa/accessibility
520 University Centre
204 474 7423
Student_accessibility@umanitoba.ca

(9) 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, the Faculty of Science and the Faculty of Engineering. 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.

(10) Voluntary Withdrawal Deadline is Wednesday **March 18**, 2020.

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/Acad _ Dishon _ TABLE _ RevCSS _ AdminC _ Jul2012 _ WEB.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.