DEPARTMENT OF MATHEMATICAL AND COMPUTATIONAL SCIENCES UNIVERSITY OF TORONTO MISSISSAUGA

MAT224H5F LEC0101 Linear Algebra II Course Outline - Fall 2019

Class Location & Time Tue, 04:00 PM - 05:00 PM IB 245

Thu, 03:00 PM - 05:00 PM CC 1140

InstructorWilliam WeissOffice LocationDH3042

Office Hours Tuesday 17:00 - 19:00 william.weiss@utoronto.ca

Course Web Site https://q.utoronto.ca

Teaching Assistant Somebody Else **Office Location** DH2034

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Course Description

Abstract vector spaces: subspaces, dimension theory. Linear mappings: kernel, image, dimension theorem, isomorphisms, matrix of a linear transformation. Change of basis, invariant subspaces, direct sums, cyclic subspaces, Cayley-Hamilton theorem. Inner product spaces, orthogonal transformations, orthogonal diagonalization, quadratic forms, positive definite matrices. Complex operators: Hermitian, unitary and normal. Spectral Theorem. Isometries of R² and R³. [36L,12T]

Prerequisite: MAT102H5, MAT223H5

Exclusion: MAT240H5, MAT224H1, MATB24H3 (SCI)

Distribution Requirement: SCI

Students who lack a pre/co-requisite can be removed at any time unless they have received an explicit waiver from the department. The waiver form can be downloaded from here.

Textbooks and Other Materials

The textbook for the course, *Linear Algebra with Applications* by W. Keith Nicholson, open edition is available on the LYRYX website.

The syllabus of the course is basically the material in chapters 6.1 - 6.5, 7.1 - 7.3, 7.5, 8.1 - 8.7, 9.1 and 10.1 of that text; the other chapters provide review of prerequisite material and some applications.

The text is available as part of the learning package from LYRYX. All MAT224F students must register on the LYRYX website for this course. Registration instructions are found here:

http://login.lyryx.com/unprotected-servlets/FDOC.html?c=LILA1 2666

There is a fee of \$39.95 payable at the registration page; this is a bargain considering the cost of other textbooks. On the other hand, registration is free for students when they work from the following selected campus computer labs: DH2010, DH2020, DH2026.

Assessment and Deadlines

Type	Description	Due Date	Weight
Assignment	5 Written Assignments	On-going	20%
Assignment	5 Online Assignments	On-going	20%
Term Test	Midterm Test	2019-10-31	20%
Final Exam		TBA	40%
		Total	100%

More Details for Assessment and Deadlines

The five written assignments are due at the beginning of the tutorial sessions on September 18, October 2, October 23, November 13 and November 27.

Online assignments will be released on the LYRYX website in a timely manner, coordinated with the lecture material. Assignment problems may be attempted as many times as desired - only the highest mark for each question will be recorded. There will be plenty of time to complete the assignments and, according to the marking scheme, there is no disadvantage to beginning the assignments as soon as they are released.

Penalties for Lateness

Written assignments submitted after the beginning of the tutorial will not be marked (see below).

The due dates for the online assignments are firm. No extensions will be given.

The fact that your computer crashed just before midnight on the due date is not a valid reason for an extension since the assignments will be released well in advance of the due dates.

Procedures and Rules

Missed Term Work

There will be **no make-up** test; if you miss the term test for a legitimate reason, the weight of the midterm test will be moved to the final exam. If you missed the midterm test, I will automatically assume that you had a legitimate reason; you do not need to contact me about this.

If you miss handing in a written assignment or hand it in after the beginning of the tutorial, I will also automatically assume that you had a legitimate reason to do so, and I will transfer the weight of the assignment to the final exam.

However, the situation may be reviewed later by the Department of Mathematical and Computational Sciences.

Documentation, for example, the official Verification of Student Illness or Injury form, which can be downloaded from:

http://www.utm.utoronto.ca/math-cs-stats/current-students/forms

should not be submitted to the instructor, but should be kept by the student to provide verification in case there is a review.

Missed Final Exam

Students who cannot write a final examination due to illness or other serious causes must file an<u>online petition</u> within 72 hours of the missed examination. Original supporting documentation must also be submitted to the Office of the Registrar within 72 hours

of the missed exam. Late petitions will NOT be considered. If illness is cited as the reason for a deferred exam request, a U of T Verification of Student Illness or Injury Form must show that you were examined and diagnosed at the time of illness and on the date of the exam, or by the day after at the latest. Students must also record their absence on ACORN on the day of the missed exam or by the day after at the latest. Upon approval of a deferred exam request, a non-refundable fee of \$70 is required for each examination approved.

Academic Integrity

Honesty and fairness are fundamental to the University of Toronto's mission. Plagiarism is a form of academic fraud and is treated very seriously. The work that you submit must be your own and cannot contain anyone elses work or ideas without proper attribution. You are expected to read the handout How not to plagiarize (http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize) and to be familiar with the Code of behaviour on academic matters, which is linked from the UTM calendar under the link Codes and policies.

Final Exam Information

Duration: 3 hours Aids Permitted: None

Additional Information

Please use your registered @mail.utoronto.ca email address for all communications with the instructor or the TAs and include "MAT224" in the subject heading.

Last Date to drop course from Academic Record and GPA is November 7, 2019.