

Mathematics 2090: Matrix Methods and Differential Equations for Engineers

Fall 2025-2026

PREREQUISITES: Math 2030 or Math 1230

INSTRUCTOR: T. Miao **OFFICE:** RB 2013 **PHONE:** 346-7722

E-MAIL: tmiao@lakeheadu.ca

LECTURES: 4 hours per week

Tuesday and Thursday 12:30 pm - 2:30 pm AT-2003

LAB: 1 hour every second week

Friday 2:30 pm - 3:30 pm AT-2004

TEXT: **Advanced Engineering Mathematics**

by Zill (**fourth, or fifth, or sixth or seventh Edition**)

COURSE OUTLINE: The topics to be covered are, tentatively, the following:

(1) Topics from Chapter 8 (Matrix algebra, determinants, and systems of linear equations; eigenvalues, eigenvectors, and diagonalization).

(2) Topics from Chapters 2 and 3 (separable and linear ordinary differential equations (ODEs) with constant coefficients).

(3) Topics from Chapter 4 (Laplace transforms).

(4) Topics from Chapter 10 (systems of linear ODEs).

(5) Topics from Chapter 12 and 15 (Fourier transforms and Fourier series).

OFFICE HOURS: Thursday 2:30 pm - 3:30 pm

If these hours do not fit your schedule you are welcome to consult with me whenever you find me in my office. You may also make appointments through the Secretary of the Department of Mathematical Sciences in RB 2012; the phone number is 343-8469.

MARK DISTRIBUTION:

Your mark for the course will be calculated according to the following formula:

(a) 10% from homework assignments.

(b) 30% from the mid-term test and 60% from the final exam. The final exam may cover both the first half and the second half of the course. The mid-term test will be from 12:30 pm to 1:50 pm on Thursday, October 23, 2025, room AT-2003. **Note this date is subject to change.**

RE-EVALUATION OF TEST:

If you want to have any of the questions in your mid-term test re-evaluated, it is important that you follow the following procedure:

(a) **DO NOT MAKE ANY CHANGES TO YOUR TEST PAPER.** If you do, then I am obliged to report this to the Dean, who shall then seek a severe penalty consistent with the offense, up to and including expulsion from the University.

(b) This instruction must be followed strictly. On a **SEPARATE** piece of paper note what is wrong with the way your test is marked. Attached it to your test paper and hand it to me. **DO NOT WRITE ANYTHING ON THE TEST PAPER.**

(c) No mark changes will be considered after seven days from the day the test is handed back.

Note that in any re-evaluation of your marks, while there is a potential for your mark to increase, there is also the possibility for your mark to decrease as well.

HOMEWORK ASSIGNMENTS: WeBWorK

WeBWorK is a free online homework system that will be required to complete the assignments. The link to access WeBWorK as well as login information will be provide to you on D2L.