MATH 152 Sec. 207  MWF 12:00 - 1:00 PM,  
Rooms: MCLD 228 (M), CHEM C126 (WF)

Instructor: Nate Bade, MATH 229A, bade.n@math.ubc.ca

Office Hours: M: 2:30 - 4:00 PM, Th: 2:00 - 3:30 PM and by appointment.

Textbook: Richard Froese and Brian Wetton: Notes for Linear Systems
http://www.math.ubc.ca/~karu/m152/notes.pdf

Course Website: www.math.ubc.ca/~karu/m152/index.html
Section Website: http://www.math.ubc.ca/~bade.n/spring2018/math152/index.html

Grade Policy:

- WebWork 10%
- Computer Labs 10%
- Two Midterm Exams Worth 15% each
- Final Exam 50%

Final Exam Performance Requirement: Students need to achieve a minimum of 40% on the final exam to pass MATH 152. Passing the MATH 152 final exam may not be sufficient to ensure a student passes MATH 152 if they have failed the term work.

Summary of Course Policies (Full list can be found on website):

WebWork Assignments:

1. WebWork Assignments are posted online every week on Fridays and have a deadline for submission on Monday (after 10 days) at 10PM.
2. There will be eleven assignments. Your lowest mark will be dropped from the average.
3. WeBWork assignments are posted on the UBC connect system.

Computer Labs:

1. Computer labs using the mathematical software package MATLAB begin in the second week of classes. Each student does a lab every two weeks, starting in the second or third week. Look at your lab section registration information to see where your lab will be held and what week you start.
2. MATLAB material will be tested on exams.
3. Lab assignments are posted on the UBC connect system. Lab report are also submitted in this system.
4. Lab reports are due on Fridays 10PM of the week when your lab takes place. (If your first lab is during the week Jan 8-12, then the report is due Jan 12. If your first lab is during the week Jan 15-19, then the report is due Jan 19.)

5. UBC has a site license for MATLAB. Registered students can download it on their own computers. Detailed instructions can be found here.

6. The lab rooms are available for your use outside of your lab hour. A schedule for the labs is posted here. Whenever there is nothing listed here, the room is free for your use.

**Exams:** We will have two evening midterm exams:

- Thu, February 8, 6-7PM
- Thu, March 15, 6-7PM.

The final exam is scheduled by the university. Students that miss midterm exams for a valid reason (official written verification is required) will have their final mark averaged proportionally over the other course material. No calculators or notes for exams.

**Math Learning Center:** There is a Math Learning Centre in LSK 301 and 302. Graduate student TAs are there to help you during the day.

**Access and Diversity:** If you are having serious academic issue due to long term illness, mental health, or personal instability issues please do not keep these to yourself. Contact your instructor or access and diversity as soon as possible to see what accommodations can be made.

**Academic Honesty:**

1. UBC takes cheating incidents very seriously. After due investigation, students found guilty of cheating on tests and examinations are usually given a final grade of 0 in the course and suspended from UBC for one year.

2. While students are encouraged to study together, they should be aware that blatant copying of another student’s work is a serious breach of academic integrity. Cases of suspected cheating will be investigated thoroughly.

3. Note that academic misconduct includes misrepresenting a medical excuse or other personal situation for the purposes of postponing an examination or quiz or otherwise obtaining an academic concession.

First year can be an overwhelming experience for many students. If you find yourself having serious academic difficulties in this course, it is best to talk to your instructor as soon as you can.
Detailed Course Outline:

Week #1 January 3-5: vectors and coordinate representation; vector length. Notes sections 2.1, 2.2, 2.3

Week #2 January 8-12: dot product, projection; determinants; cross product; lines in 2D, lines and planes in 3D. 2.3, 2.4, 2.5

Week #3 January 15-19: lines and planes (continued); geometry of solutions of linear systems; linear dependence and independence; 2.5, 2.6

Week #4 January 22-26: solving linear systems; echelon form, reduced row echelon form, rank; homogeneous equations. 3.1, 3.2, 3.3

Week #5 January 29 - February 2: homogeneous systems (continued); geometric applications; resistor networks. 3.3, 3.4, 3.5

Week #6 February 5-9: Midterm #1; matrix multiplication; linear transformations. 4.1, 4.2

Week #7 February 12-16: (Monday holiday) rotations, projections and reflections in 2D; matrix representation and composition of linear transformations; random walks. 4.2, 4.3, 4.4

Spring Break: February 19-23

Week #8 February 26-March 2: random walks (continued); transpose; matrix inverse; determinants. 4.3, 4.4, 4.5, 4.6

Week #9 March 5-9: determinants (cont.); complex numbers; complex exponential and polar form; 4.6, 5.1, 5.2, 5.3, 5.4

Week #10 March 12-16: Midterm #2; eigenvalues and eigenvectors 6.1

Week #11 March 19-23: eigenvalues and eigenvectors (cont.); powers of a matrix; application of eigen-analysis to random walks. 6.1, 6.2

Week #12 March 26-30: (Friday holiday) vector differential equations; application of vector DEs to electrical networks. 6.3, 6.4

Week #13 April 2-6: complete course material; review.