

# BIT1001 Linear Algebra Winter 2020

**Instructor:** Dr. Jabir M. Abdulrahman  
5250 HP Tel: 613-520-2600 ext. 1983  
Email: [jabira@math.carleton.ca](mailto:jabira@math.carleton.ca)

**Office Hours:** Mon. and Wed.: 3:00– 4:00 pm

**Textbook:** **Linear Algebra and its Applications, 3rd Edition by  
Mohammad R. Sadeghi & Jabir Abulrahman (Available at Haven Books)**

**Prerequisite:** Ontario Grade 12 Mathematics: Geometry and Discrete Mathematics; or an OAC  
in Algebra and Geometry; or MATH 0005; or equivalent; or permission of the school.

**Lectures:** Mon., and Wed.: 10:05 to 11:25 am AP132

**Classes start on** Mon. Jan. 6, 2020 ,and **classes end** on Tue. Apr. 7,2020

**Tutorials:** Wed . 1:35-2:25 pm starting Mon. Jan. 13,2020.

**Evaluation:** 10% Tutorial attendance  
40% Tests (The best 2 tests out of 3 tests)  
50% Final Exam

**Tutorial Work** There will be an hour tutorial each week. Except for the three test weeks, the tutorials will be devoted to problem solving. Please make sure to always go to the tutorial section you are registered in.

## **Term Tests**

There will be three 50-minute tests held in the tutorial hours on:

**Jan. 29, Feb.26 , Mar.18.**

There will be **no make-up tests**. Students are allowed to miss one test without penalty. In case when a student misses more than one test due to illness (supported by a doctor note) jury duty or extreme personal misfortune, the term mark may be pro-rated. It is each student's responsibility to collect the marked tests from the TA. The test papers are normally distributed in the tutorial session following the date of the test.

## **Final Examination:**

There will be a 3-hour exam scheduled during the usual exam period (Apr. 13- 25). It is the responsibility of each student to be available at the time of the final examination. In particular, no travel plans for the examination period in April should be made until the examination schedule is published.

## **Calculators:**

Only **non-programmable, non-graphing calculators** for the tests and the final examination.

## **Announcements:**

You are responsible for keeping up with information announced in class or sent to your connect email account. The following **course schedule** is approximate, and may change subject to the progress of the class. The material covered on each test will be announced in class one week before the test.

## Tentative Course Schedule

**The following week by week schedule is subject to change depending on the progress of the course**

|    | Dates              |                       |              | Topics  |
|----|--------------------|-----------------------|--------------|---|
| 1  | Jan 6 –10          |                       | 1.1 ,1.2     | Systems of Linear Equations Row Reduction and Echelon Forms                                     |
| 2  | Jan 13 – 17        | <b>First tutorial</b> | 1.3,2.1,2.2  | .Solving Systems of Linear Equations, Matrix Operations, Inverse of a Matrix and Linear Systems |
| 3  | Jan 20 – 24        |                       | 2.3,3.1      | Matrix Operations, Inverse of a Matrix and Linear Systems                                       |
| 4  | Jan27 – 31         | <b>Test 1</b>         | 3.2,3.3      | Elementary Matrices( without LU-Factorization), Introduction to Determinants,                   |
| 5  | Feb3– 7            |                       | 3.4,4.1      | Properties of Determinants, Cramer’s Rule, Adjoint of a Matrix. Vectors                         |
| 6  | Feb 10– 14         |                       | 4.2,4.3,4.4  | Vector Operations, Vector \spaces and ,Subspaces  |
| 7  | <b>Feb 17 – 21</b> | <b>break</b>          |              | Winter Break  |
| 8  | Feb 24 – 28        | <b>Test 2</b>         | 4.4          | Spanning Sets   |
| 9  | Mar 2 – 6          |                       | 4.5,4.6,4.7  | Basis and Dimension, Rank. Coordinates  |
| 10 | Mar 9-- 13         |                       | 5.1,5.2      | Linear Transformations,   |
| 11 | Mar 16 – 20        | <b>Test 3</b>         | 5.3,App B    | Matrices of Linear Transformation, Complex Numbers  |
| 12 | Mar 23 – 27        |                       | 6.1, 6.2,6.3 | Eigen Values and Eigen Vectors  |
| 13 | Mar 30 – Apr 3     |                       | 6.4,7.1      | Complex Eigen Values and Eigenvectors, Inner Products   |
|    | Apr 6– 7           |                       | 7.2          | Orthogonal Bases, Final Exam Review   |

**Math Tutorial Centre:** You can study and get help from teaching assistants in the Math Tutorial centre. It is located in HP3422 and is open Monday-Thursday 11:00am-4:00pm, and Fridays 11:30am-3:30pm. You may also join the Math & Stats Learning Assistance Program which offers extra support for first year mathematics courses. For more information, visit  
<https://carleton.ca/math/math-tutorial-centre>  
<https://carleton.ca/math/math-learning-assistance-program>

**Students with disabilities:** Students with disabilities requiring academic accommodations in this course are encouraged to contact the Paul Menton Center for Students with Disabilities (500 University Center) to complete the necessary forms. After registering with the Center, make an appointment to meet with me in order to discuss your needs at least two weeks before the first in-class test or CUTV midterm exam. This will allow for sufficient time to process your request. Please note the following deadlines for submitting completed forms to the PMC for formally scheduled exam accommodations: TBA for fall and fall/winter term courses, and TBA for winter term courses."

**Academic Accommodation:** You may need special arrangements to meet your academic obligations during the term because of disability, pregnancy or religious obligations. You can visit the Equity Services web site to view the policies and to obtain more detailed information on academic accommodation at <http://carleton.ca/equity/accommo>

**Academic Accommodation:** You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows: **Pregnancy obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#)

**Suggested practice problems From (“Linear Algebra and its Applications” by  
Mohammad R. Sadeghi and Jabir M. Abulrahman. 3rd Edition).**

**Chapter 1**

**1.1: 1-25**

**1.2: 1-15**

**1.3: 1-17,21-25,29-32**

**Chapter 2**

**2.1: 1-13 ,15,17**

**2.2: 1-13 ,15-19**

**2.3: 1-13**

**Chapter 3**

**3.1: 1-15**

**3.2: 1-13**

**3.3: 1-13**

**3.4: 1-15**

**Chapter 4**

**4.1: 1-7**

**4.2: 1-5**

**4.3: 1-9**

**4.4: 1-9 , 11,13-17, 19,21, 23-27**

**4.5: 1-17 , 19, 21**

**4.6: 1-11, 13-17,19,21**

**4.7: 1-5**

**Chapter 5**

**5.1:1-7,10,11,13,15**

**5.2: 4-7**

**5.3: 1-7,9-15**

**Chapter 6**

**6.1: 1-15 , 18- 21, 23-27**

**6.2: 1-5,7-11**

**6.3: 1-5**

**6.4: 1-6**

**Chapter 7**

**7.1: 1-21 , 25-35, 38-41**

**7.2: 1-7, 9-12, 14-20**

**7.3: 1-7**