

# Course Outline – 1ZC3/1B03 Winter 2018

- **Course Home Page**

- The course home page is NOT on Avenue to Learn. It is right here!

- **Course Description**

- **Course Title:** Math 1B03 Term 2/1ZC3 - Linear Algebra I/Engineering Mathematics II-B
- **Class Times and Locations:** Check [Mosaic](#)

- **Instructor Information**

- Math 1B03 Section 1 (C01) Instructor Information

- **Name:** [Aaron Childs](#)
- **Email:** [childs@mcmaster.ca](mailto:childs@mcmaster.ca)
- **Office Location:** HH/213
- **Office Hours:** Click [here](#)

- Math 1B03 Section 2 (C02) Instructor Information

- **Name:** [Johannes Hofscheier](#)
- **Email:** [hofschej@mcmaster.ca](mailto:hofschej@mcmaster.ca)
- **Office Location:** HH/407
- **Office Hours:** Tuesday 2:30pm-3:30pm and Wednesday 1:30pm-2:30pm

- Math 1ZC3 Section 1 (C01) Instructor Information

- **Name:** [Chris McLean](#)
- **Email:** [mcleac3@math.mcmaster.ca](mailto:mcleac3@math.mcmaster.ca)
- **Office Location:** BSB/B124
- **Office Hours:** TBA

- Math 1ZC3 Section 2 (C02) Instructor Information

- **Name:** [Matthias Nagel](#)
- **Email:** [nagelm1@mcmaster.ca](mailto:nagelm1@mcmaster.ca)
- **Office Location:** HH/414
- **Office Hours:** Tuesdays 10:00am-11:00am.
- Math 1ZC3 Section 3 (C03) Instructor Information
  - **Name:** [Ian Payne](#)
  - **Email:** [paynei@mcmaster.ca](mailto:paynei@mcmaster.ca)
  - **Office Location:** HH/409
  - **Office Hours:** TBA
- Math 1ZC3 Section 4 (C04) Instructor Information
  - **Name:** [Johannes Hofscheier](#)
  - **Email:** [hofschej@mcmaster.ca](mailto:hofschej@mcmaster.ca)
  - **Office Location:** HH/407
  - **Office Hours:** Tuesday 2:30pm-3:30pm and Wednesday 1:30pm-2:30pm
- **Textbook**
  - **Required:** *Elementary Linear Algebra - Applications Version*, 11th Edition, Anton and Rorres, Wiley  
(**Note:** Older editions can be used, as long as you have access to the exercises in the 11th edition.)
  - **Optional:**  
Student Solutions Manual for Elementary Linear Algebra - Applications Version  
Matlab (Version 7 or later) Software

A copy of the textbook and solutions manual are available on reserve in Thode Library.
- **Material Covered**
  - All sections covered in the [suggested problems](#).
  - **Major Topics:** Systems of linear equations and matrices, determinants, euclidean vector spaces, eigenvalues and eigenvectors, complex numbers, general vector spaces, applications
- **Assignment Information**

- There will be 5 online assignments. See the [Important Dates](#) for the due dates.
- **Lab Information**
    - There will be 5 labs which will require the use of Matlab (Version 7 or later). See the [Important Dates](#) for the due dates.
    - You do not have to attend any scheduled lab times. But TAs will be available if you need help at the times given on the [Lab Information Page](#).
    - All information about labs is available on the [Lab Information Page](#).
- **Test Information**
    - Calculators are NOT allowed on any of the tests or exams.
    - Some sample tests are available under 'Content Groups' to the left.
    - **Tentative Dates** (subject to change):  
**Test #1:** Wednesday February 14th  
**Test #2:** Wednesday March 21st
    - Check the [Announcements](#) for room and time information, and for instructions on what to do if you have a conflict with the test time.
- **Course Evaluation**
    - 5 Assignments - 2% each  
5 Labs - 2% each  
2 Tests - 20% each  
Final Exam - 40%
    - At the end of the course the grades may be adjusted, but this can only increase your grade and will be done uniformly. We will use the grade equivalence chart published in the Undergraduate Calendar to convert between percentages and letter grades.
    - The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.
- **Missed Work Policy**
    - If you are absent from the university for a minor medical reason, lasting fewer than 3 days, you may report your absence, once per term, without documentation, using the [McMaster Student Absence Form](#). Absences for a longer duration or for other reasons must be reported to your Faculty/Program office, with documentation, and relief from term work may not necessarily be granted. When using the MSAF, report your absence to [childs@mcmaster.ca](mailto:childs@mcmaster.ca). Please note that the MSAF may not be used for term work worth 25% or more, nor can it be used for the final examination. For more information look [here](#).

- If your MSAF form was received then the word "note" will appear in place of your mark on the marks page. This will show up within one week after you filled out the MSAF form. If you don't see the word "note" in place of your mark for the missed work one week after filling out the MSAF form, then send an email to [Dr. Childs](#). If you do see the word "note" in place of your mark, then no follow-up is required.
  - The percentage for a missed test will be added to your final exam.
  - The percentage for a missed assignment or lab will be distributed among your remaining assignments or labs.
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- **Academic Dishonesty**
    - Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.
    - It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at <http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf>
    - The following illustrates only three forms of academic dishonesty:
      1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
      2. Improper collaboration in group work.
      3. Copying or using unauthorized aids in tests and examinations.

## Lecture Schedule

- **Week 1: January 4-5**
  - **Lecture 1** - Introduction, 1.1 (Systems of Linear Equations)
- **Week 2: January 8-12**
  - **Lecture 2** - 1.2 (Gaussian Elimination)
  - **Lecture 3** - 1.3 (Matrices and Matrix Operations)
  - **Lecture 4** - 1.3 (continued), 1.4 (Inverses, Properties of Matrices)
- **Week 3: January 15-19**
  - **Lecture 5** - 1.4 (Inverses, Properties of Matrices, Continued)
  - **Lecture 6** - 1.5 (Elementary Matrices)
  - **Lecture 7** - 1.5 (Continued), 1.6 (More on Linear Systems and Invertible Matrices)
- **Week 4: January 22-26**
  - **Lecture 8** - 1.6 (Continued)
  - **Lecture 9** - 1.7 (Diagonal, Triangular, and Symmetric Matrices)
  - **Lecture 10** - 2.1 (Determinants by Cofactor Expansion)
- **Week 5: January 29 - February 2**
  - **Lecture 11** - 2.2 (Evaluating Determinants by Row Reduction)
  - **Lecture 12** - 2.3 (Properties of Determinants, Omit Cramer's Rule)
  - **Lecture 13** - 5.1 (Eigenvalues and Eigenvectors)
- **Week 6: February 5-9**
  - **Lecture 14** - 5.1 (Continued)
  - **Lecture 15** - 5.2 (Diagonalization)

- **Lecture 16** - 5.2 (Continued)
- **Week 7: February 12-16**
  - **Lecture 17** - 5.5 (Dynamical Systems and Markov Chains)
  - **Lecture 18** - 5.5 (Continued)
  - **Lecture 19** - [10.1](#), [10.2](#) (from 9th Edition, Complex Numbers, Division of Complex Numbers)
- **Week 8: February 19-23 (Midterm Recess)**
- **Week 9: February 26 - March 2**
  - **Lecture 20** - [10.3](#) (from 9th Edition, Polar Form of a Complex Number)
  - **Lecture 21** - 3.1 (Vectors in 2-space, 3-space, and  $n$ -space)
  - **Lecture 22** - 3.2 (Norm, Dot product, and Distance in  $R^n$ )
- **Week 10: March 5-9**
  - **Lecture 23** - 3.3, 3.4 (Orthogonality, The Geometry of Linear Systems)
  - **Lecture 24** - 3.4 (Continued), 3.5 (Cross Product)
  - **Lecture 25** - 4.1 (Real Vector Spaces)
- **Week 11: March 12-16**
  - **Lecture 26** - 4.1 (Continued), 4.2 (Subspaces)
  - **Lecture 27** - 4.2 (Continued)
  - **Lecture 28** - 4.3 (Linear Independence)
- **Week 12: March 19-23**
  - **Lecture 29** - 4.3 (Continued), 4.4 (Coordinates and Basis)
  - **Lecture 30** - 4.4 (Continued)
  - **Lecture 31** - 6.3 (Gram-Schmidt Process, Omit Example 9 and QR-Decomposition)

- **Week 13: March 26-29 (no classes on March 30th)**
  - **Lecture 32** - 6.3 (Continued), 4.5 (Dimension)
  - **Lecture 33** - 4.5 (Continued), 4.7 (Row Space, Column Space, and Null Space)
  - **Lecture 34** - 4.7 (Continued)
  
- **Week 14: April 2-6**
  - **Lecture 35** - 10.14 Cryptography
  - **Lecture 36** - 10.14 (Continued), Review
  - **Lecture 37** - Review
  
- **Week 15 - April 9**
  - Lecture 38 - Review
  - (Classes end on April 9th)