MATH 244-01– Linear Algebra
Spring 2017
MWF 12:00-12:50 PM, Swords 359

Syllabus

Instructor: Prof. David Damiano, 341 Swords, 793-2476/3374
e-mail: ddamiano@holycross.edu

Office Hours: Monday 11 AM - Noon, Tuesday 1-2 PM, Wednesday 1-2 PM, Thursday 11 AM - 1 PM, and by appointment.

Teaching Assistant: Sarah Tymochko will be the teaching assistant for the course. (Sarah TA’d for MATH 243 in the fall.) She will hold regular problem sessions most Tuesdays and Thursdays at 7:00 PM in Swords 330. Depending on vacations and exams, these may be on different nights. Any changes will be announced in class several days before the day of a session.

Course Home Page: http://math.holycross.edu/~dbd/math244/math244.html


Note there is only one paperback version, so if you have it you’re set whether new or used. The original (out of print) version is hardcover and has errors that were corrected in the paperback version.

Prerequisites: MATH 243, Algebraic Structures, or permission of the instructor or department chair.

Intended Audience: This course is designed for and required of students who are majoring in mathematics. However, it may also of value to students majoring in physics, chemistry, or economics.

Quick Summary: Linear Algebra is a one semester course that presents the theory of vector spaces and functions between vector spaces, which are known as linear transformations. The concepts we will develop in this course are used in virtually every area of mathematics. Additionally, they appear everywhere in physics and many areas of chemistry and economics.

We will cover essentially all of the material in the first four chapters of the text. While the material is self-contained, we will make use of ideas from Algebraic Structures to motivate concepts in this course. If you have not take Structures, there will be times when you should speak to me or your peers who took the course last semester for explanations of the concepts being referred to.

While it is likely that everyone in class has seen vectors in a previous course, most likely multivariable calculus or physics, our approach here will emphasize the theory of linear algebra.

Class Format: (See the schedule on the last page of the syllabus.) Although most classes will be lectures there will in class activities, roughly six in the semester.

Homework will usually be due on Fridays. Days when homework is due there will be a short
quiz based on the homework. The quizzes will usually consist of two questions, one asking you to provide a definition of a concept and the other asking you to use that concept. These will not be due on the same day as regular homework.

There will be two exams given in the evening. The exams will last 90 minutes. If you are unable to take a test at a scheduled time, it will be possible to arrange to take it at another time. The final exam will be given at the regularly schedule time determined by the registrar.

**Optional Lectures:** There will be a half-dozen or so colloquium lectures in the department this semester. If you attend two of these lectures you may drop one homework assignment or an additional quiz (making three quizzes that you drop). In each case, you can drop the homework or quiz on which you had the lowest percentage. For each of the lectures that you attend, you should, write a brief summary (about half a page) of the content of the lecture.

**Grading:** There are several components to the course grade:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Quizzes (7)</td>
<td>20% (total)</td>
</tr>
<tr>
<td>Tests (2 × 20% each)</td>
<td>40%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

There are 9 scheduled quizzes 15-20 minutes in length. You may drop 2 quiz grades for a total of 7 quizzes that count for credit. The two tests will be given in the evening and will be 90 minutes in length. Each graded assignment, quiz and exam will receive a numerical score which will contribute to the appropriate percentage. The final exam is a comprehensive 2 1/2 hour exam covering the entire semester. At the end of the semester, total course percentages will be used to determine final grades. I do not use an absolute scale to determine letter grades.

**Academic Honesty:** The Department of Mathematics and Computer Science adheres to the College’s policy on Academic Honesty, which may be found in the on-line College Catalogue. In addition, the department has formulated the attached statement intended to amplify the policy as to how it might apply in mathematics and computer science.
Learning Tips. Here are several suggestions to help you learn mathematics.

- In class: Take careful notes. If you don’t understand an idea or point being made or a proof, ask about it. We have plenty of time to answer questions but you must ask them. When opportunities arise to talk in groups. Talking about mathematics is an important way to formulate your understanding of the concepts.

- Out of class: Reread your class notes as soon after class as possible. Summarize your notes for the next class and reread your summaries to prepare for the next class. Read the text before attempting assignments. Mark up the text not just by highlighting but by commenting about concepts and calculations in the margins. Rewrite ideas in your own words and fill in the gaps in the text’s explanations. Also, note things that you don’t understand so that you can ask about them in class.

- Reading mathematics: Mathematics is expressed in a dense but rich symbolic language that has been refined literally over centuries. It is both precise and concise. Learning mathematics, including algebraic structures, necessarily involves mastering this symbolic language. Accordingly, mathematics must be read differently than ordinary prose. One must be attentive to every line and every word of the text and to every symbol that appears on the page.

- Homework: The goal of assignments is to help you develop your understanding of the material. This is accomplished both by basic questions which help to become fluent in the symbolic language of mathematics, and by more involved proofs which allow you to explore ideas. You should attempt homework problems after reading the text and your notes. The least effective way to learn the material is to parrot examples in the text that appear to be close to a particular homework problem. You may also find it helpful to discuss homework problems with other students in the class. It is, however, essential that you write up your own solutions and do not copy those of anyone else.

- Office Hours: If you find that you have additional questions that you would like to ask outside of class, which is quite common in Algebraic Structures, please see me in office hours. While I’m pleased to speak with students about the course at any time, it’s important for your benefit that you seek assistance before assignments are due.

- Quiz and Test Preparation: Quizzes will be given at the beginning of class, so it is important that you have your questions answered prior to that class. There will be evening review sessions prior to each test. You should begin studying for tests at least one week in advance; you should organize your studying so that you progress through all the material that is covered on the test; you should study from the text, class notes and graded assignments; and you should cover a particular topic several times from different sources. It is important to break up your studying into manageable chunks of time that are spread over each day of the week before the test. Of course, you should make use of office hours and review sessions. The same comments hold for the final exam, which is a comprehensive exam covering all the course material.
MATH 244-01, Spring 2017 Course Schedule:

- Week 1: 1/25 Lecture.
  1/27 Lecture.
- Week 2: 1/30 Lecture.
  2/1 Lecture.
  2/3 Quiz 1/Lecture.
- Week 3: 2/6 Lecture.
  2/8 Lecture.
  2/10 Quiz 2/Lecture.
- Week 4: 2/13 Lecture.
  2/15 Lecture
  2/17 Quiz 3/Lecture.
- Week 5: 2/20 Lecture.
  2/22 Lecture.
  2/24 Quiz 4/Lecture.
- Week 6: 2/27 Lecture.
  2/28 TEST 1: 6:30-8:00 PM.
    Swords 359
  3/1 Lecture.
  3/3 Lecture.
- Spring Vacation: 3/6 – 3/10
- Week 7: 3/13/ Lecture.
  3/15 Lecture.
  3/17 Quiz 5/Lecture.
- Week 8: 3/20 Lecture.
  3/22 Lecture.
  3/24 Quiz 6/Lecture.
- Week 9: 3/27 Lecture.
  3/29 Lecture.
  3/31 Quiz 7/Lecture.
- Week 10: 4/3 Lecture.
  4/4 TEST 2: 6:30-8:00 PM.
    Swords 359.
  4/5 Lecture.
  4/7 Lecture.
- Week 11: 4/10 Lecture.
  4/12 Quiz 8/Lecture
  4/14 Easter break.
- Week 12: 4/17 Easter break.
  4/19 Lecture.
  4/21 Lecture (No quiz).
  4/26 No class.
    Academic Conference.
  4/28 Quiz 9/Lecture.
- Week 14: 5/1 Lecture.
  5/3 Lecture.
  5/5 Lecture.
- Week 15: 5/1 Lecture.
  5/9-5/10 Study Period.
- Final Exam: Date TBA