MAT 316 Fall 2012 Introduction to Linear Algebra

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Prerequisites: Grade of C or better in MAT 137.

Description: Introduction to Linear Algebra (3). Systems of equations, matrices, vector spaces, linear transformations, eigenvalues.

Learning outcomes: Upon completion of the course, students will be able to

1) Know the axioms for a vector space and the definition of Linear Transformation.

2) Be able to find the Matrix of a Linear Transformation.

3) Know how to manipulate matrices, including addition, multiplication, and Gauss reduction to normal form.

4) Be able to apply Gauss reduction to the solution of systems of Linear Equations.

5) Be able to find bases with special properties and know how to find the coordinate vector representation of a vector in any basis, and how to change representations when the basis changes and the same for the matrix representations of a Linear Transformation in different bases.

6) Be able to select a basis so that the Matrix Representation of a Linear Transformation has some desired special form, like upper triangular, diagonal or skew symmetric.

7) Know the definition of inner product (Euclidean) vector space and how to find orthonormal bases for it by means of the Gram Schmidt process.

8) Know how to find a basis for a Linear Operator with a symmetric matrix so that the new matrix becomes diagonal.

Recommended textbook: David Lay, Linear Algebra and its applications. No homework is going to be assigned from this text.

Grading: A : 90.0%, B : 80.0%, C : 70.0%, D : 60.0% Check the accuracy of your scores regularly on the grade sheet posted on the web. Grades are not negotiable based on personal reasons like scholarships, graduation time, job offers etc. Cutoff levels are firm.

- Weights: 20% homework, quizzes, attendance; 57% tests; 23% final
- Tests: There will be 3 tests. The exact dates will be announced at least a week before the tests in class and on the course web page. Use of electronic devices (advanced calculators, ipods, cell phones, etc.) and cheat sheets will not be allowed on the tests. Simple calculators only capable of the 4 basic operations are allowed (but not required) on tests and quizzes. Borrowing calculators from other students on tests are forbidden. Class attendance is very important. You are responsible for material covered in class whether or not it is in the online text. It is important to take notes, and review them after class.

  Coming to class in not sufficient preparation for taking the tests. The problems on the tests are not always routine calculation. You need to have a deep understanding of the material. You need to spend a considerable amount of time preparing for the test. Review your notes, make sure you understand the theory and examples we do in class. Review the handouts, test each other with questions.
- Comprehensive final exam: A final exam is scheduled on finals week. Exact dates and times are available on the NAU academic calendar web site
- Quiz: A quiz may be given at any time without announcement. There may be group and individual quizzes.

- Homework: Homework will be assigned regularly on WeBWorK or on paper. Try to log in to WeBWorK as soon as possible to make sure you have an account. Let me know immediately if you experience difficulties logging in. Check WeBWorK regularly for new assignments. Check the course web page regularly for announcements. Homework is the foundation of your learning. You cannot expect to solve the assigned problems easily. Some problems require a great deal of effort and time. Even if you are unable to solve a problem, the time spent on trying is not wasted. The only way to build mathematical skills is to think about problems. The more you think the more you know. Do not spend your time on memorization. Try to understand everything as deeply as possible. The emphasis in this class, like in any mathematics class, is on understanding. Your questions are always appreciated.
  No late homework is accepted. It is recommended to create study groups and discuss the assigned problems but you need to solve your homework set on your own. The discussion forum on Vista is a convenient way to communicate with other students in the class. Please feel free to discuss the homework problems on the discussion forum.

  Resources: Computers are available in rooms AMB 137 and AMB 222.

  Portfolio: Please collect and save all handouts and graded material in a portfolio.

  Activities: You can earn extra credit by submitting solutions to the proble of the week.

  Dates: Last day to drop/add: September 6 (no W appears on transcript). Last day to withdraw: October 26.

  Make up tests will be given only in case of verified medical or other emergency which must be documented. You must make a reasonable effort to notify me as soon as you can. Let me know before a missed test is given if possible. The best way to contact me is by email. Tell me your name and class time if you send me an email.

  Classroom Etiquette: Laptop and cell phone use (including texting) during classes is inappropriate.

  All the information on this syllabus are subject to change and any class announcements regarding the syllabus are considered official amendments to it. This syllabus and other information is available on the course web page.