Math 237-101
Linear Algebra

Course information:	Math 237-101 – Linear Algebra Fall 2017 Course format: Web-enhanced	**Instructor:**	Dr. Steven Clontz sclontz@southalabama.edu MSPB (ILB) 314
Meeting times:	MW 3:35-4:50 MSPB (ILB) 360	**Office hours:**	W 10:30-3:30, 4:50-5:50

Course description

This course provides an introduction to linear algebra. Topics include systems of linear equations, matrices, Gaussian elimination, rank, linear independence, subspaces, basis, dimension, linear transformations, determinants, eigenvalues and eigenvectors, change of basis, diagonalization, the abstract concept of a vector space, and applications. Core Course.

Course materials

The textbook is *Linear Algebra with Applications* by Holt, second edition. An older first edition would also be fine, although some of the homework problem numbers have changed.

Learning Outcomes

At the completion of this course, each student should be able to...

1) Solve systems of linear equations.
2) Determine whether or not a set with given operations is a vector space or a subspace of another vector space.
3) Determine properties of sets of vectors such as whether they are linearly independent, whether they span, and whether they are a basis.
4) Perform fundamental operations in the algebra of matrices, including multiplying and inverting matrices.
5) Use and apply algebraic properties of a linear tranformation.
6) Determine geometric information about a linear transformation, including computing determinants, eigenvalues, and eigenvectors.

Topics

We will cover the topics outlined on the **Course Standards** sheet provided to you, in the order that they appear on that sheet. These topics are taken from the first seven chapters of the textbook, but are arranged in a more efficient order.

Attendance Policy

Attendance is required for this course, and will be tracked each day. "Perfect" attendence is considered anything greater than 80% to account for a small number of short term absences for any reason. You are responsible for maintaining records of any excused absences, but you should only present these records to me if your attendence drops below 80%.

Standards Based Grading

This course is graded by a methodology called **standards based grading**. Instead of receiving one percentage grade for an assessment, you will be assessed on whether or not you mastered individual **learning standards**. A list of these 23 standards is available in Sakai. Your grade in the course will be based on how many of these standards you demonstrate mastery of. **On each standard, you will have the opportunity to earn up to two checkmarks; the total number of checkmarks you earn will determine your grade** (see below).

Feedback

Each time an attempt to demonstrate mastery is submitted, the attempt will be marked as follows.

- ✓ means you successfully demonstrated mastery of that standard, so check off another box on your progress report!
- ***** means you made a minor mistake, unrelated to the standard being assessed; for example, if made a single arithmetic error while row reducing a matrix but did everything else correctly. If you rework the problem completely correctly **within one week**, this mark will be changed to ✓, but after one week this mark will be counted as ⚠ instead.
- ⚠ means you made a good faith attempt and demonstrated partial understanding, but did not demonstrate full mastery of that standard on this assessment. You are eligible to reattempt demonstrating mastery of this standard outside of class; see "Reattempts" below.
- × means there was **No Significant Evidence** of understanding.

Due to limitations in Sakai's gradebook, grades will only be available via occassional progress reports. You may request a new progress report during office hours as well.

Out-of-class Reattempts

Most ✓s should be earned during in-class quizzes or exams; you only need to earn two for each standard, and most standards will be assessed on four quizzes, the midterm (if covered before midterm), and on the final.

During office hours most Wednesdays, you will be given the opportunity to improve up to two ⚠ to ✓ from different standards that you have not earned a ✓ within the past week. You must bring a completed **Reattempt form** with several homework exercise solutions. After discussion of these solutions, if it appears you have likely mastered the standard, you will be given an additional exercise to take home and complete. Once submitted, this exercise will be marked with ✓, *****, or ×.

This policy may be alatered due to availability and scheduling concerns. In particular, this policy may be altered during the week of the midterm or the final week of class, or in the case of heavy demand. You are encouraged to earn ✓s during quizzes and exams whenever possible, and to take advantage of this policy as early in the semster as possible.

Assessments

There will be three kinds of in class assessments:

- As mentioned above, **each day we will have a quiz** in the last 15 minutes of class giving you opportunity to master several standards. Note that you must have participated in class that day to be eligible to take the quiz. A schedule listing which standards will appear on which quizzes is available in Sakai.
- There will be a **midterm exam on Wednesday, October 11** and a **final exam on Wednesday, December 6 at 3:30**.

Grading

At the end of the semester, your grade will be computed in the following manner.

To earn a letter grade of ...	... you should at least do ALL of the following...	OR do this.
A	• Earn 40 mastery checkmarks; • Complete 10 homework reports; • Have an 80% attendence record.	Earn 45 mastery checkmarks
B	• Earn 35 mastery checkmarks; • Complete 8 homework reports; • Have an 80% attendence record.	Earn 40 mastery checkmarks
C	• Earn 30 mastery checkmarks; • Complete 6 homework reports; • Have an 80% attendence record.	Earn 35 mastery checkmarks
D	• Earn 20 mastery checkmarks; • Complete 4 homework reports; • Have a 50% attendence record.	Earn 25 mastery checkmarks
F	• Not fit in the above categories.	

Homework

The only way to learn mathematics is to do mathematics; for this reason, I will regularly provide you with homework problems. **These are for your own practice.** You are not asked to hand these in for a grade. Instead, you are expected to turn in a homework report each week (blank ones are available in Sakai). In the report, you will list problems you've worked on for practice, and ones you are still having trouble with. **Homework reports are due every Wednesday at the beginning of class.** Late homework reports will not be accepted.

Missed Exams and Coursework

The midterm and final exams can only be made up in the event of illness (with a doctor's note), or other emergent situation (with appropriate documentation). The definition of "emergent" is at the discretion of the instructor. Quizzes can only be made up if several in a row are missed due to an acceptable excuse as defined above.

Calculator Policy

Calculators of any sort may be used on exams provided that the calculator cannot make phone calls, send text messages, or access the internet. A calculator that performs row reduction of matrices will be useful. You will only receive credit on standards for which you show all your work, but you may use a calculator to skip any details that have been assessed on another standard. For example, you can use a calculator to row-reduce a matrix, unless the standard being assessed is row reduction itself.

Student Academic Conduct Policy

All students are expected to adhere to the Student Academic Conduct Policy, which you can view at `http://www.southalabama.edu/bulletin/current/student-affairs/conduct.html`. Students violating this policy will be given one or more of the following penalties based on the severity of the offense: 1) Loss of all mastery checkmarks on all standards affected by the misconduct; 2) Reduction in final course grade by a letter grade; 3) Automatic course failure.