Syllabus for: (name of class)

MATH-45-E3882 (033882) ***Linear Algebra***

Semester & Year:	Fall 2013	
Course ID and Section Number:	MATH-45-E3882 (033882) Linear Algebra	
Number of Credits/Units:	4 units Lecture	
Day/Time:	MWF 2:50PM - 4:05PM, 8/26/13-12/6/13 (*except for 9/2, 11/11, 11/29, which are holidays, so class will not meet on those days*); Official Final Class Meeting: Monday 12/9/13, 3:15pm-5:15pm	
Location:	LRC Room 105	
Instructor's Names:	Tami Matsumoto & Bruce Wagner	
Contact Information:	Tami Matsumoto Office: SC 205 B Ph: 707-476-4543 tami-matsumoto@redwoods.edu	Bruce Wagner Office: SC 216 K Ph: 707-476-4207 bruce-wagner@redwoods.edu

Course Description (catalog description as described in the course outline):
The use and application of matrices in the solution of systems of linear equations, determinants, vector spaces, linear transformations, eigenvalues, eigenvectors, diagonalization, and orthogonality. Linear algebra is a core course in many engineering, physics, mathematics, and computer science programs.
Note: *Computer exploration is an integral component of this course. Students will also create and present oral and written analyses of a topic that requires use of the concepts and techniques learned in this course.* Prerequisite: Math 50A (or equivalent) with a grade of "C" or better

Student Learning Outcomes (as described in the course outline) :

1. Use the theory of linear algebra as a fundamental problem-solving tool.
2. Apply the mathematics of linear algebra to real-world problems and applications.
3. Use computer technology to perform matrix computations, explore mathematical concepts, and verify results.
4. Use sound mathematical writing and appropriate use of numerical, graphical, and symbolic representations to present solutions of mathematical exercises and applications.

Special accommodations: College of the Redwoods complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request at least one week before the first test so that necessary arrangements can be made. No last-minute arrangements or post-test adjustments will be made. If you have a disability or believe you might benefit from disability related services and may need accommodations, please see me or contact Disabled Students Programs and Services. Students may make requests for alternative media by contacting DSPS.

Academic Misconduct: Cheating, plagiarism, collusion, abuse of resource materials, computer misuse, fabrication or falsification, multiple submissions, complicity in academic misconduct, and/ or bearing false witness will not be tolerated. Violations will be dealt with according to the procedures and sanctions proscribed by the College of the Redwoods. Students caught plagiarizing or cheating on exams will receive an "F" in the course.

The student code of conduct is available on the College of the Redwoods website at:
http://redwoods.edu/District/Board/New/Chapter5/AP%205500%20Conduct%20Code%20final%2002-07-2012.pdf

Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the college catalog and on the College of the Redwoods homepage.

College of the Redwoods is committed to equal opportunity in employment, admission to the college, and in the conduct of all of its programs and activities.

Math 45: Linear Algebra

Fall 2013

section E3882

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Class Sessions: MWF 2:50-4:05 in LRC 105
Course homepage: *http://msenux.redwoods.edu/math45*
CR Course Outline:
http://inside.redwoods.edu/Curriculum/Outlines/Mathematics/MATH-45_05.11.12.doc

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GENERAL DESCRIPTION OF THIS COURSE: Linear algebra consists of an interesting mixture of computational techniques and abstract theory. The theory arises out of the study of the use and applications of matrices in the solution of systems of linear equations, and leads through the topics of determinants, vector spaces, linear transformations, eigenvalues, and eigenvectors. Linear algebra also has many applications in other areas of mathematics, in the physical and social sciences, and in business. Consequently, linear algebra is a core course in many engineering, physics, mathematics, and computer science programs.

In a mathematics curriculum, linear algebra is usually the first course in which students are expected to understand all of the theory, and to learn to read and understand proofs. That is because the theory is relatively accessible, and the proofs are generally short and fairly straight-forward. This gives students their first glimpse at how mathematical theory and rigor is developed, and how this development is the real basis of the subject. Another good reason for using linear algebra as a first "proof" course is that it also includes many computational aspects (i.e., it is not just abstract theory), and the theory can be easily demonstrated with examples.

We will study both the abstract theory and the computations, and will also look at some applications.

PREREQUISITE: Math 50A with a grade of C or better, or equivalent.

TEXTBOOK: *Linear Algebra and its Applications,* by David C. Lay (4th edition). The corresponding Student Study Guide is a useful supplement. The Study Guide includes detailed solutions to many of the odd exercises, supplementary material in the form of study notes and tips, key ideas, warnings, etc., and also has help resources for calculators and computers.

EXAMS: There will be three midterm exams. Makeup exams will only be given if there is a very good and verifiable reason for missing the exam. Notify one of us immediately if you cannot take an exam at the scheduled time. There will also be some quizzes. There will be a final project in place of a final exam.

HOMEWORK

Daily Practice: There will be daily reading and homework assignments that will be mostly computational and routine, and assigned primarily for practice. You are expected to complete these assignments each day, and come to class prepared to discuss them. You are also required to keep a neatly organized binder with your completed homework assignments, which will be collected and checked at various times during the term. However, you are also encouraged to submit these daily assignments early, and you will receive extra credit in that case.

Weekly Written Assignments: Most of your homework grade will be based on weekly homework assignments that will be collected and graded carefully. These assignments will generally be more challenging and will involve more intermediate steps, synthesis of concepts, experimentation, and writing. To promote improvement in your mathematical writing ability, you will be allowed to rewrite any incorrect problems on these assignments.

Computer Assignments: Some of the assignments will involve the use of Matlab to help you learn and explore the concepts of the course. You will also gradually learn how to use TeX (the mathematics typesetting language) to write your solutions. TeX (and probably Matlab) will also be needed for your final project.

In general, the homework will be indicative of the type and difficulty of material that you need to know for the exams. You are expected to turn in homework assignments on time.

FINAL PROJECT: Each student is required to complete a final project. The subject of the final project must be a real-world application of linear algebra, or possibly an application of linear algebra to another area of mathematics. Each student will be expected to complete a written report and also give a brief presentation. Presentations will be given during finals week. More information about the project will be available later in the course.

GRADING:

To receive at least an A- grade. you must have done all of the following:

- Homework assignments and class activities: 90% or more
- Exams and Quizzes: 85% or more
- Project: All project requirements and benchmarks met satisfactorily. Research paper is well-written and complete, with a well-delivered and interesting presentation.

To receive at least a B- grade. you must have done all of the following:

- Homework assignments and class activities: 80% or more
- Exams and Quizzes: 72% or more
- Project: Most project requirements and benchmarks met satisfactorily. Research paper and presentation both generally good, but not both outstanding.

To receive at least a C- grade. you must have done all of the following:

- Homework assignments and class activities: 70% or more
- Exams and Quizzes: 60% or more
- Project: Research paper submitted and presentation given at a basic level, or either not complete or with substantial errors and deficiencies.

To receive at least a D- grade. you must have done all of the following:

- Homework assignments and class activities: 60% or more
- Exams and Quizzes: 50% or more
- Project: Research paper and presentation at lower level than C- grade (see above). Or research paper submitted with no presentation, or presentation given without submitting paper.

USE OF CALCULATORS: A good graphing calculator is required. The calculator must have the capability to use matrices and to solve linear systems of equations. Recommended calculators for students in linear algebra are the TI-83+, TI-84+, TI-92, TI-89, TI-86, or TI-85.

The TI-89 and TI-92 can do symbolic calculations. While these calculators are powerful and useful tools, the ability to do linear algebra calculations by hand is important for understanding the concepts. Therefore, unless otherwise indicated, you will be expected to show all steps on your homework and exams in order to receive full credit for your work.

There are a limited number of calculators available for rent from the Mathematics Department for $20 per semester.

USE OF COMPUTERS: Our class will also make use of Matlab as a computational and visual aid to understanding the course material. We will use Matlab in the classroom, and you may also use it in the computer lab in Science room 212 to help with homework and projects. However, no prior computer knowledge is required for the course – you will receive instructions on how to use Matlab.

You will also learn the basics of TeX, the mathematics typesetting language, for writing up your project report and some homework solutions.

You will receive an account to use the computers in Science 212. Both Matlab and TeX are installed on these computers.

A student version of MATLAB (for Windows or Mac OS X) is available for your home computer if you are interested. There are free versions of TeX available for Windows, Mac OS X, and Linux.

COURSE INFORMATION ON THE WEB: Information on computer use and the use of Matlab and TeX will be available on our class WWW page at *http://msenux.redwoods.edu/math45*. You should also consult this site regularly for information on homework assignments, exams, etc.

ATTENDANCE POLICY: Students are expected to attend every class session. Students who miss class are still responsible for material covered and work assigned, so they should find out what they missed and must get any information needed to complete assignments on time.

Mathematics Department Policy Regarding "Faculty Withdrawal" of Students after Census Day: A student who is absent from class for the amount of time equal to two weeks of classes will be withdrawn from the course, unless there are extenuating circumstances that are communicated to the instructor in a timely manner. This "faculty withdrawal" can occur between Week 4 and Week 10 of the semester.

The Department's "Faculty Withdrawal" policy to drop students with excessive absences is due to the severely diminished likelihood of a successful outcome in the course. It is important to note that, if it is the student's *intention* to withdraw from the course, the responsibility remains with the student to ensure that the proper paperwork has been filed – that is, students are not to assume the "Faculty Withdrawal" will automatically be filed.

DISABILITIES: Any student who feels that s/he may need an accommodation based on the impact of a disability should contact either instructor as soon as possible. The student will also need to visit the Disabled Student Programs and Services office (476-4280) and obtain a DSPS Support Services Agreement. Every effort will be made to meet accommodation requests. However, no retroactive accommodations will be provided.