MATH 321-001 – Linear Algebra Fall 2009, Liberty University, Lynchburg, VA	Class Meets: in Science Hall 135 Lecture Times: M-W-F: 2:55:-3:45pm
Thus shall you say to them: "The gods who did not make the heavens and the earth shall perish from the earth and from under the heavens" It is he who made the earth by his power, who established the world by his wisdom, and by his understanding stretched out the heavens. *Jeremiah 10:11-12* ***(E.S.V.)***	Instructor: James S. Cook Office: Applied Science 105 Office Hours: M-W-TH 5:00-6:20pm Email: jcook4@liberty.edu office phone: 434-582-2476

COURSE DESCRIPTION

A first course in linear algebra and its applications with emphasis on matrix operations. It includes systems of linear equations, nullspace and rank of matrices, determinants, eigenvectors and diagonalization, reduction of quadratic forms, introduction to vector spaces and linear mappings.
(3 hours credit)

RATIONALE

Linear algebra is an essential part of the curriculum of majors such as: Computer science, Engineering, Economics, Physics, Mathematics. It has a broad range of applications in those areas. For most students, Linear Algebra is the first course that blends computational and conceptual aspects of mathematics.

PREREQUISITE: MATH 200/MATH 250.

It is the student's responsibility to make up any prerequisite deficiencies, as stated in the Liberty University Catalog, which would prevent the successful completion of this course.

LEARNING OUTCOMES.

- Student will be fluent in row reducing matrices and will acquire the Jordan-Gauss elimination algorithm for solving linear systems.
- Student will be able to solve problems from a variety of areas inside and outside Mathematics using system of linear equations.
- Student will be able to derive linear relations between column-vectors of a matrix from its row reduced echelon form.
- Student will be able to compute inverse matrices and determinants using row reduction.
- Student will learn to prove most of matrix algebra formulas and the main theorems of the course.
- Student will be able to compute its eigenvalues and determinants.
- Students will learn abstract vector space as a unifying concept for understanding properties of vectors, polynomials and matrices.
- Student will learn diagonalization and some applications.

MATERIALS.

• Required Notes: See my website for course notes. These note function as our text more than the text itself.

• Required Text: *Elementary Linear Algebra: a matrix approach,* Spence, Insel and Friedberg. 2nd. Edition.

• No graphing calculator is required for this course. Mathematica can do much more than even the best graphing calculator. I will allow (basic) scientific calculators during tests, but **no graphing calculators**, laptops, PDAs, IPODS,cell phones, bluetooth-type devices, or any other electronic device capable of either data storage or communication. If in doubt ask.

ASSIGNMENTS / ASSESSMENTS.

ATTENDANCE.

Students are to be in attendance at all class meetings. An emergency absence must be documented at the first day of return to class. Student is responsible for the missed material. ***An absence of convenience or early departure to a break is not a valid excuse.***

Any quiz or test missed during an unexcused absence counts **zero**.
A missed quiz or test during *an excused* absence must be made up without delay, the first day after absence.

Students are expected to cooperate in maintaining the class atmosphere conducive to learning. Cell ***phones*** must be turned ***off*** during class.
Students are to abide by the ***Liberty Way*** code of conduct.

GRADING POLICY.

- 3 Tests(1500pts each),
- Weekly Homework(500pts),
- Quizzes(500pts),
- 4 Problem Sets(1500pts total),
- Final (3000pts).

The grade scale is:

A: 10000+...9000	**B**: 8999...8000	**C**: 7999...7000
D: 6999...6000	**F**: below 5999.	

- Late assignments are accepted, but penalized by 60% per day late in general.

I do not "give grades", rather you EARN your grade through your responsible and continual efforts to master the material. I want everyone to pass my course, but it is you who must do the work. I will do everything in my power to help you work effectively. The recipe for passing is quite simple: come to class, pay attention, do your homework. I rarely fail anyone who actually does these three simple things.

•Missed Tests: If you have an emergency absence then the weight of the final may be increased. If your absence is known ahead of time then you need to notify me so we can make arrangements.

OTHER POLICIES.

Dress code:

Students are expected to come to class dressed in a manner consistent with the Liberty Way

Honor code
We, the students, faculty and staff of Liberty University, have a responsibility to uphold the moral and ethical standards of this institution and personally confront those who do not.

Academic misconduct
Academic misconduct includes: academic dishonesty, plagiarism, and falsification. See Liberty Way for specific definitions penalties and processes for reporting.

Disability statement:
Any students with a documented disability may contact the Office of Disability Academic Support (ODAS) in TE 127 in order to make arrangements for an academic accommodation."

DROP/ADD policy
A Fall/Spring course may be dropped without a grade, tuition, and fee change within the first five days of the semester. From the sixth day until the end of the tenth week, a Fall/Spring course may be withdrawn with a grade of W/WF.

Class room policies
The inappropriate use of technology, such as cell phones, iPods, laptops, calculators, etc in the classroom is not tolerated. Other disruptive behavior in the classroom is not tolerated. Students who engage in such misconduct will be subject the penalties and processes as written in the Liberty Way.

EXAMS CALENDAR.

Documents related to the course calendar: Study outlines, assignments and reading are posted on the course website which is linked at my webpage www.supermath.info

The following is a tentative schedule:

Itinerary and week by week reading guide: the Chapters and section numbers refer to my course notes. I intend for lecture to cover topics as described below.
You might find the material is easier to understand if you read ahead.

- Week 1 [Aug 24 - Aug 28]: Chapter 1.
- Week 2 [Aug 31 - Sept 4]: Chapter 2 sections 1-7.
- Week 3 [Sept 7 - Sept 11]: Finish Chapter 2 and Chapter 3 sections 1-4.
- Week 4 [Sept 14 - Sept 8]: Finish Chapter 3 and read sections 1-3.

TEST I [Sept 23]: Test I covers Chapters 1-3

- Week 5 [Sept 21 & Sept 25]: Read section 4.4.
- Week 6 [Sept 28 - Oct 2]: Finish Chapter 4.

- Week 7 [Oct 5 - Oct 7]: Read Chapter 5.

FALL BREAK: [Oct 8 & Oct 9] (we miss Friday.)

- Week 8 [Oct 12 - Oct 16]: Read Chapter 6 sections 1-3.

TEST II [Oct 21]: Test II covers Chapters 4-5

- Week 9 [Oct 19 & Oct 23]: Chapter 6 sections 4-6.
- Week 10 [Oct 26 - Oct 30]: Finish Chapter 6.
- Week 11 [Nov 2 - Nov 6]: Chapter 7 sections 1-4.
- Week 12 [Nov 9 - Nov 13]: Chapter 7 sections 5-8.
- Week 13 [Nov 16 - Nov 20]: Chapter 7 sections 9-11.

THANKSGIVING: [Nov 21 - Nov 29] (note this does not include Nov 20 or Nov 30.)

TEST III [Dec 2]: Test III covers Chapters 6-7

- Week 14 [Nov 2 & Dec 4]: Chapter 7 sections 12-13.
- Week 15 [Dec 7 - Dec 9]: Finish Chapter 7.

Disclaimer: *While I have attempted to completely specify the content of this course, I reserve the right to change this syllabus if necessary. It is your responsibility to monitor your Liberty University email account for any changes in the syllabus. I will notify you via email and announce in class in the event something needs modification. Thanks!*