TEXAS A&M UNIVERSITY-CORPORUS CHRISTI
DEPARTMENT OF MATHEMATICS AND STATISTICS

MATH 3311.001
LINEAR ALGEBRA
Fall 2014

I. COURSE INFORMATION

Instructor: Dr. Pablo Tarazaga
Office Phone: 825-3187
Office Address: CI 316
E-Mail Address: pablo.tarazaga@tamucc.edu
Office hours: TR 10:00 to 12:00
M 10:00 to 11:00

Meeting Time and Place: Math 3311.001 MWF 8:00-8:50 IH 156

II. COURSE DESCRIPTION

This course will deal with the basic concepts of Linear Algebra. They include linear
spaces, solution of linear systems of equations, least square solution for
overdetermined systems, orthogonality, projections, orthogonal basis, eigenvalues and
eigenvectors. The concept of matrix factorization.

III. PREREQUISITES

MATH 2413 (Calculus I).

IV. TEXT AND OTHER SUPPLIES REQUIRED

The textbook for the course is Introduction to Linear Algebra by Gilbert Strang, Fourth

V. COURSE LEARNING OUTCOMES

• Students will be able to understand and handled basic concepts of Linear Algebra:
  • Vectors and matrices, operations, properties and Euclidean inner product.
  • Linear systems, computing solutions, LU factorization, inverse of a matrix.
  • Linear spaces and subspaces, column space, null space, etc.
  • Solution of a general linear system.
  • Independent vectors, basis and dimension.
• Orthogonality and Projections
• Least square solutions.
• Orthogonal Basis and Gram-Schmidt process.
• Eigenvalues and Eigenvectors
• Spectral theorem

VI. INSTRUCTIONAL METHODS AND ACTIVITIES.

The class uses lecture format encouraging student participation and discussion.

VII. EVALUATIONS AND GRADE ASSIGNMENTS

• All the work done in the class will be part of your final grade (tests and final). I will evaluate very carefully the learning objectives.
• The table below shows the weight of each of the items considered to determine your grade.
• Assignments will be given with each section of the book that we cover during the course, but they will not be collected. Office hours are a great opportunity to ask more questions about homework. On-campus free tutoring in CASA is another way of getting help with the homework.
• Both tests and the final will contain a part on definitions, rules and theorems, a part on techniques and a part on understanding and basic proofs.
• Final exam will be comprehensive.

Test #1: 30%
Test #2: 35%
Final exam: 35%

Your final grade will be determined using the following scale:
A: 90%-100%  B: 80%-89%  C: 70%-79%  D: 60%-69%  F: 0%-59

VIII. TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/25</td>
<td>Introduction to vectors, length and dot product</td>
</tr>
<tr>
<td>9/1</td>
<td>System of linear equations.</td>
</tr>
<tr>
<td>9/8</td>
<td>The idea of Gauss elimination: elementary operations.</td>
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<tr>
<td>9/15</td>
<td>Gauss elimination using elementary matrices.</td>
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<tr>
<td>9/22</td>
<td>Operations with matrices</td>
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<tr>
<td>9/29</td>
<td>Inverse of a matrix.</td>
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<tr>
<td>10/6</td>
<td>LU factorization. Transposition, symmetric matrices.</td>
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<tr>
<td>Date</td>
<td>Topic</td>
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<td>----------------------------------------------------------------------</td>
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<tr>
<td>10/13</td>
<td>Space of vectors.</td>
</tr>
<tr>
<td>10/20</td>
<td>Solving systems, $Ax=0$ and $Ax=b$. Midterm</td>
</tr>
<tr>
<td>10/27</td>
<td>Generators, independence and basis.</td>
</tr>
<tr>
<td>11/3</td>
<td>The four fundamental subspaces.</td>
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<tr>
<td>11/10</td>
<td>Orthogonality of the four subspaces. Projections</td>
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<tr>
<td>11/17</td>
<td>Least Squares and the Gram-Schmidt process.</td>
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<tr>
<td>11/24</td>
<td>Eigenvalues and eigenvectors, diagonalization, symmetric matrices</td>
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<tr>
<td>12/1</td>
<td>Positive Definite Matrices and Similar matrices</td>
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<tr>
<td>Dec 5</td>
<td>Final Exam (8:00 – 10:30)</td>
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IX. CLASS POLICIES

- Attendance: It will not be part of your grade, but it is required. Exceptions are sickness and emergencies.

- I do expect that you come to each class ready to learn and to participate. Also you have to be prepared to do any required work. You are expected to devote for each hour of class a minimum of two or three hours outside the class working in the subject (some people need more time than others).

- If you are missing a deadline, a quiz or a test, you have to tell me beforehand by any mean, examples: e-mail or phone.

- Grades: After you receive your grades you have up to a week to dispute it. I am the person you can dispute your grade with.

- If at any point during the course you are considering to drop the class, talk to me before you do it. I am here to help you in your learning experience and to help you to succeed in your college career.

- **PLEASE TURN YOUR CELLULAR PHONES OFF. DO NOT USE THEM DURING THE CLASS. DO NOT DISTURB THE CLASS WITH THEM. KEEP IT IN YOUR POCKET OR IN YOUR BAG.**

*Academic Integrity/Plagiarism*

University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty
includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one's own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in grade zero.

**Dropping a Class**

I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. July 25, 2014 is the last day to drop a class with an automatic grade of “W” this term.

**Classroom professional behavior**

Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

**Grade Appeals**

As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage ([http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html)). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

**Disabilities Accommodations**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall 116.
If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

**Statement of Academic Continuity**

In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.