Linear Algebra, Math 3311.002  
Department of Mathematics and Statistics  
Fall 2017 – Revised Post Harvey

A. **COURSE INFORMATION**
   - **Course number/section:** MATH 3311.002  
   - **Class meeting time:** TR 7:00 – 8:15 PM  
   - **Class location:** IH – 158  
   - **Course Website:** bb9.tamucc.edu

B. **INSTRUCTOR INFORMATION**
   - **Instructor:** George Tintera  
   - **Office location:** CI 319  
   - **Office hours:** Tuesday to Thursday, 1 to 3 pm  
   - **Telephone:** 361-825-6028  
   - **E-mail:** george.tintera@tamucc.edu  
   - **Appointments:** Appointments outside of office hours are available by request

C. **COURSE DESCRIPTION**
   - Fundamentals of linear algebra and matrix theory. Topics include vectors, matrix operations, linear transformations, fundamental properties of vector spaces, systems of linear equations, eigenvalues and eigenvectors. Applications.

D. **PREREQUISITES AND COREQUISITES**
   - MATH 2413. There are no co-requisites.

E. **REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES**
   - **Textbook:** Introduction to Linear Algebra, 5th Ed. By Gilbert Strang (older edition is fine).
   - **Calculator:** Any graphing calculator will help you, but is not required. I will support the TI-84. The calculator will serve as a tool for understanding and solving problems encountered in this course.

F. **STUDENT LEARNING OUTCOMES AND ASSESSMENT**
   - Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The students learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.
Upon successful completion of this course, students should be able to:

1. Make basic calculations with vectors and matrices, including addition, multiplication and inner products, and identify and use properties of the operations.
2. Identify and solve linear systems of equations using elimination, inverse matrices and LU factorization.
3. Work with linear spaces and their subspaces, including column and row spaces.
4. Understand and apply linear independence, spanning, bases and dimension to linear spaces.
5. Define and use orthogonality of vectors to make projections and to carry out Gram-Schmidt Orthogonalization.
6. Find and apply eigenvalues and eigenvectors and diagonalize matrices.
7. Apply the spectral theorem. (as time allows)
8. Make matrix and vector calculations with a calculator and a software package.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

The class uses the lecture format with student participation and discussion. The primary tool for investigations will be graphing calculators and matlab.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Grades will be calculated by homework, test, and exam, according to the following percentages.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>50</td>
</tr>
<tr>
<td>Extended Homework</td>
<td>50</td>
</tr>
<tr>
<td>Quizzes</td>
<td>100</td>
</tr>
<tr>
<td>Test</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
</tbody>
</table>

- **Homework**: Homework will be assigned after each class. It will be due Thursday of the week after it is assigned.

- **Extended Homework**: The class uses the lecture format with student participation and discussion. The primary tool for investigations will be graphing calculators and matlab.

- **Quizzes**: Mastery quizzes will be given the first 15 minutes of most Thursday classes. Students will perform calculations done for the homework. They may be repeated outside of class if mastery is not demonstrated in class.

- **Test**: There will be an in-class test over Objectives 1 to 3. It is tentatively scheduled for
October 26

- **Final Exam**: 7:15-9:45 PM, Thursday, December 14th. It will be comprehensive.

Your final grade will be assigned according to the following table:

<table>
<thead>
<tr>
<th>Point Total</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥360 points</td>
<td>A</td>
</tr>
<tr>
<td>≥320 points</td>
<td>B</td>
</tr>
<tr>
<td>≥280 points</td>
<td>C</td>
</tr>
<tr>
<td>≥240 points</td>
<td>D</td>
</tr>
<tr>
<td>Below 240 points</td>
<td>F</td>
</tr>
</tbody>
</table>

I. **COURSE CONTENT/SCHEDULE**

**Important dates:**
- August 28: First Day of Classes
- October 26: Test
- ?? ??: Last Day to Drop a Class
- November 23: Thanksgiving Day – No class
- December 5: Last Day of Classes
- December 7: Reading Day

**Course Schedule:**

<table>
<thead>
<tr>
<th>Week of</th>
<th><strong>Tuesday</strong></th>
<th><strong>Thursday</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept 4</td>
<td>Vectors and Operations</td>
<td>Matrices</td>
</tr>
<tr>
<td>Sept 11</td>
<td>Vectors and Linear Equations</td>
<td>Q1, Elimination</td>
</tr>
<tr>
<td>Sept 18</td>
<td>The Process of Elimination</td>
<td>Q2, E1, Matrix Operations</td>
</tr>
<tr>
<td>Sept 25</td>
<td>More Matrix Operations</td>
<td>Q3, Algebra with Matrices</td>
</tr>
<tr>
<td>Oct 2</td>
<td>Elimination = Factorization</td>
<td>Q4, E2, LU Permutations</td>
</tr>
<tr>
<td>Oct 9</td>
<td>Spaces of Vectors</td>
<td>Q5, Null Spaces, Solving Ax=0</td>
</tr>
<tr>
<td>Oct 16</td>
<td>Rank and Row Reduced Form</td>
<td>Q6, E3, Complete Solutions to Ax=b</td>
</tr>
<tr>
<td>Oct 23</td>
<td>Review</td>
<td>Test</td>
</tr>
<tr>
<td>Oct 30</td>
<td>Independence and Bases</td>
<td>Q7, Bases and Dimension</td>
</tr>
<tr>
<td>Nov 6</td>
<td>Orthogonality</td>
<td>Q8, Projections</td>
</tr>
<tr>
<td>Nov 13</td>
<td>Least Squares</td>
<td>Q9, E4, Orthogonal Bases and finding them.</td>
</tr>
<tr>
<td>Nov 20</td>
<td>Introduction to Eigenvalues</td>
<td>Thanksgiving - No Class</td>
</tr>
<tr>
<td>Nov 27</td>
<td>Diagonalizing a Matrix</td>
<td>Q10, Symmetric Matrices</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
<td>Details</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Dec 4</td>
<td>Review, E5</td>
<td>Reading Day – No Class</td>
</tr>
<tr>
<td>Dec 11</td>
<td>Final Exam</td>
<td>Thursday, December 14, 7:15-9:45 pm</td>
</tr>
</tbody>
</table>

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

- **Attendance/Tardiness**
  I will check the attendance in every class. Attendance is mandatory by Texas A&M University. Please save absences for emergencies.

- **Late Homework Assignments**
  Late assignments will not be accepted, unless exceptional circumstances prevent you from completing them. Extension of deadlines will be at the instructor’s discretion. Late assignments may result in partial or total loss of credit. There are **NO** make-ups for exams or in-class activities.

- **No Make-up for Midterm/Final Exams**
  Missed Exam:
  No make-ups will be given without written evidence of an Official University excused absence. For an absence to be considered excused, the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g. accident or emergency) the student must provide notification by the end of the second working day after the absence. In the case of illness or injury, students are required to obtain a confirmation note from a health care professional affirming date and time of a medical office visit regarding the illness or injury.

- **Extra Credit**
  There will be no extra credit for this course. Do your best to complete the work assigned.

- **Cell Phone Use**
  Please silence phone before coming to class. If you need to make a call, please go outside the classroom. **ANY USE OF A CELL PHONE OR WIRELESS DEVICE DURING A TEST CARRIES THE PRESUMPTION OF CHEATING. A GRADE OF 0 WILL BE AWARDED FOR THAT ASSIGNMENT FOR USING, TOUCHING OR GLANCING AT A CELL PHONE OR WIRELESS DEVICE.**
• **Laptop Use**
  Laptops, or any form of a new technology device is NOT allowed in the classroom during lecture and exam.

• **Food in Class**
  Food is not allowed in the classroom.

K. **COLLEGE AND UNIVERSITY POLICIES**

• **Academic Integrity (University)**
  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 a failing grade.

• **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.

• **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

• **Deadline for Dropping a Course with a Grade of W (University)**
  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 your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. 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. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day
to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  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 at [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.

- **Disability Services**
  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 (361) 825-5816 or visit Disability Services 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. [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

- **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.

I. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins.
Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

M. GENERAL DISCLAIMER
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.