Central College -Mathematics
Math 2318: Linear Algebra
CRN **20645** – Fall 2012 (6131)
4 hour lecture course / 64 hours per semester/ **16** Weeks
Textbook: *Elementary Linear Algebra Applications Version*,
Anton, Rorres, 2010, Wiley, Inc., Tenth Edition. ISBN-13: 978-0470432051

Instructor: **Professor Sever**
Instructor Contact Information: Email: **sever_2318@cofinite.com, Office Phone 713-718-6453**
Office location and hours: **MW 10:00 – 11:00 AM**

Course Description
Topics include systems of linear equations, vector spaces, matrices, linear mappings, and determinants.
Prerequisite: MATH 2413. 3 credits (3 lecture).

Course Goal
This course is intended primarily to prepare students for calculus. It can also be used for general mathematics credit.

Textbook
Elementary Linear Algebra Applications Version, Anton, Rorres, 2010, Wiley, Inc., Tenth Edition.
Note: For this course, you ***must*** purchase access to the WileyPlus software. Please refer to my *Learning Web* page after 08/22/12 for information regarding textbook/software purchasing options.

Course Student Learning Outcomes (SLO):
1. Students will demonstrate competence with the basic ideas of linear algebra including concepts of linear systems, independence, theory of matrices, linear transformations, bases and dimension, eigenvalues, eigenvectors and diagonalization.

2. Compose clear and accurate proofs using the concepts of this course.

Learning objectives
1. Determine if a system of equations is consistent and find its general solution.
2. Row reduce a matrix to reduced echelon form.
3. Apply solution methods of linear system for various problems.
4. Solve the equation $Ax = b$ where A is an m x n matrix and x is in $\Re^n$.
5. Write the solution set of a given homogeneous system in parametric vector form.
6. Determine if the columns of a given matrix form a linearly dependent set.
7. Understand the linear transformation defined by $x \to Ax$.
8. If T is a linear transformation, find the standard matrix of T.
9. Matrix algebra including the inverse of a matrix.
10. Recognize various characterizations of nonsingular matrices.
11. Compute the products of matrices, which are partitioned conformably.
12. Compute the determinant of a given matrix.
13. Combine row reduction and cofactor expansion to compute a given determinant.
14. Determine a subspace from a vector space.
15. Determine a null space and a column space.
16. Find bases for vector spaces.
17. Use an inverse matrix to find $[x]_\beta$ for the given x and β.
18. Find the dimension of the subspace spanned by the given vectors.
19. Given an m x n matrix, find the rank and nullity of the matrix.
20. Change the coordinates of a vector from a basis to a standard basis.
21. Find the characteristic polynomial of a given matrix.
22. Given a matrix and an eigenvalue, find the basis for the corresponding eigenspace.

Calendar

The Course Calendar is distributed under separate cover. Please see instructor website and/or the instructional software WileyPLUS.

Instructional Methods

I am interested in teaching courses at both the developmental and college levels. At the college-level of the community college curriculum, I am most interested in teaching Algebra, Finite Math, Linear Algebra, Precalculus, and Calculus.

Instructional Goal Summary

- I want every mathematics student with whom I come into contact to excel in his or her profession.

- I want to encourage all students, and especially the students with whom I spend most of my time when I am on campus, to cultivate and develop the necessary skills with which to face the new world (and workplace) when they complete their degrees or program at HCC.

- I want my mathematics students to be highly proficient in their field and also exhibit the highest standards of ethical behavior.

- I want my students to realize that the classroom is as relevant as the "*real world*" and to be able to use effectively the critical thinking skills learned in my class

Finally, I want my students to enjoy the learning process, to look forward to each class meeting and to leave the classroom at the end of the semester with a feeling of satisfaction from having learned new and useful mathematics.

Student Assignments

Exams

There will be **three** in class examinations, say T_1, T_2, & T_3. Each exam is worth 100 points. *In regards to the academic integrity of this course, it will be the case that some of the examinations including the Final Exam will administered online at an HCC Testing Center.* Information regarding test dates and times are contained in the Course Calendar (which is available in the instructional software). In addition, please do not share any material during an exam or quiz.

Homework Notebook

The homework exercises for the semester are attached on a separate page. The Homework assignments will be administered on-line using the instructional software. Your **Homework** grade **H** will be the average of your homework assignments and is based on 100 point scale.

Quizzes

There will be *approximately* 10 – 12 quizzes. The quizzes will be given at the discretion of the instructor and the majority of the quizzes will be contained in the course calendar (see WileyPLUS for the Course Calendar). Each quiz is worth 100 points. Before your Quiz Average **Q** is computed, the lowest quiz score will be dropped.

Final Exam

There will be a ***comprehensive final examination*** given at the end of the semester. There will be a ***comprehensive final examination*** given at the end of the semester. The final exam, say **F**, is worth 100 points. Unless otherwise indicated, ***the final examination will be administered in a testing center.*** Please refer to the Course Calendar for dates and times of the Final Exam.

Assessments

The quizzes and homework assignments for this course are administered on-line and may be taken at a location of your convenience. ***In regards to the academic integrity of this course, it will be the case that some of the examinations including the Final Exam will administered online at an HCC Testing Center***.

Course Grade
Your course average is given by the following expression:

$$\frac{17(T_1 + T_2 + T_3) + 12Q + 12H + 25F}{100}$$

In **no fashion** will the course average be curved. In addition, the traditional grade scale will be applied. That is,

90 – 100 **A**, 80 - 89 **B**, 70 - 79 **C**, 60 - 69 **D**, below 60 **F**.

Make - Up Exams and Quizzes
There will be **no make-up exams or make-up quizzes** during the semester. If you miss an examination or a quiz, then you receive a 0 for that assessment item.

Instructional Units

The course is logically divided into three instructional units. Each major examination corresponds to an instructional unit. The instructional units are summarized below.

Unit Contents

Unit 1 (Exam 1)
- Systems of linear equations and Matrices   *Sections*: 1.1 → 1.7

- Determinants   *Sections*: 2.1 → 2.3

- Euclidean Vector Spaces   *Sections*: 3.1 → 3.2

Unit 2 (Exam 2)
- General Vector Spaces   *Sections*: 4.1 → 4.11

Unit 3 (Exam 3)
- Eigenvalues and Eigenvectors   *Sections*: 5.1, 5.2 and 5.3 (Optional)

- Linear Transformations   *Sections*: 8.1 → 8.5

HCC Policy Statement - ADA

Services to Students with Disabilities

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at his or her respective college at the beginning of each semester. Faculty members are authorized to provide only the accommodations requested by the Disability Support Services Office. Persons needing accommodations due to a documented disability should contact the ADA counselor for their college as soon as possible. At Central College, a student may contact the appropriate personnel by telephone at 713.718.6164. Also, interested students may wish to consult the **Disability Support Services Student Handbook** which may be found online. To visit the ADA Web site, please visit www.hccs.edu then click Future students, scroll down the page and click on the words Disability Information.

HCC Policy Statement: Academic Honesty

A student who is academically dishonest is, by definition, not showing that the coursework has been learned, and that student is claiming an advantage not available to other students. The instructor is responsible for measuring each student's individual achievements and also for ensuring that all students compete on a level playing field. Thus, in our system, the instructor has teaching, grading, and enforcement roles. You are expected to be familiar with the University's Policy on Academic Honesty, found in the catalog. What that means is: If you are charged with an offense, pleading ignorance of the rules will not help you. Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Penalties and/or disciplinary proceedings may be initiated by College System officials against a student accused of scholastic dishonesty. "Scholastic dishonesty": includes, but is not limited to, cheating on a test, plagiarism, and collusion.

Academic Dishonesty on a test includes:
- Copying from another student's test paper;
- Using unauthorized materials;
- Collaborating with another student during a test without authorization;
- Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of a test not yet administered.

Plagiarism means the appropriation of another's work and the unacknowledged incorporation of that work in one's own written work offered for credit.

Collusion mean the unauthorized collaboration with another person in preparing written work offered for credit. Possible punishments for academic dishonesty may include a grade of 0 or F in the particular assignment, failure in the course, and/or recommendation for probation or dismissal from the College System. (See the Student Handbook.)

HCC Policy Statements

Class Attendance - It is important that you come to class! Attending class regularly is the best way to succeed in this class. For complete information regarding Houston Community College's policies on attendance, please refer to the Student Handbook. Class attendance (i.e., participation) is checked routinely. Although it is your responsibility to drop a course for nonattendance, the instructor has the authority to drop you for excessive absences. **Students may be dropped from a course after accumulating absences in excess of six (8) hours of instruction**. In the online instructional mode, missed class time is defined as not engaging the instructional software for significant periods of time.

HCC Course Withdrawal Policy

If you feel that you cannot complete this course, you will need to withdraw from the course prior to the final date of withdrawal.   Before, you withdraw from your course; please take the time to meet with the instructor to discuss why you feel it is necessary to do so. The instructor may be able to provide you with suggestions that would enable you to complete the course. Your success is very important. Beginning in fall 2007, the Texas Legislature passed a law limiting first time entering freshmen to no more than **SIX** total course withdrawals **throughout** their educational career in obtaining a certificate and/or degree.

To help students avoid having to drop/withdraw from any class, HCC has instituted an Early Alert process by which your professor *may* "alert" you and HCC counselors that you might fail a class because of excessive absences and/or poor academic performance. It is your responsibility to visit with your professor or a counselor to learn about what, if any, HCC interventions might be available to assist you – online tutoring, child care, financial aid, job placement, etc. – to stay in class and improve your academic performance.

If you plan on withdrawing from your class, you **MUST** contact a HCC counselor or your professor prior to withdrawing (dropping) the class for approval and this must be done **PRIOR** to the withdrawal deadline to receive a "W" on your transcript. **Final withdrawal deadlines vary each semester and/or depending on class length, please visit the online registration calendars, HCC schedule of classes and catalog, any HCC Registration Office, or any HCC counselor to determine class withdrawal deadlines. *Remember to allow a 24-hour response time when communicating via email and/or telephone with a professor and/or counselor. Do not submit a request to discuss withdrawal options less than a day before the deadline.* If you do not withdraw before the deadline, you will receive the grade that you are making in the class as your final grade. For this academic term, the last day for student withdrawals is

November 2, 2012 at **4:30 PM**.

After this deadline, the registrar's office will not accept a withdrawal form from either the instructor or student; and, the student will receive a grade of 'A', 'B', 'C', 'D' or 'F'. To reiterate, it is impossible for the instructor to withdraw any student after the official withdrawal deadline.

Repeat Course Fee

The State of Texas encourages students to complete college without having to repeat failed classes. To increase student success, students who repeat the same course more than twice, are required to pay extra tuition. The purpose of this extra tuition fee is to encourage students to pass their courses and to graduate. Effective fall 2006, HCC will charge a higher tuition rate to students registering the third or subsequent time for a course. If you are considering course withdrawal because you are not earning passing grades, confer with your instructor/counselor as early as possible about your study habits, reading and writing homework, test taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available.

Classroom Behavior

See Student Handbook.

Use of Camera and/or Recording Devices

As a student active in the learning community of this course, it is your responsibility to be respectful of the learning atmosphere in your classroom. To show respect of your fellow students and instructor, you will turn off your phone and other electronic devices, and will not use these devices in the classroom unless you receive permission from the instructor. Use of recording devices, including camera phones and tape recorders, is prohibited in classrooms, laboratories, faculty offices, and other locations where instruction, tutoring, or testing occurs. Students with disabilities who need to use a recording device as a reasonable accommodation should contact the Office for Students with Disabilities for information regarding reasonable accommodations.

Instructor Requirements

WileyPLUS

In this course, we will be using an online resource called **WileyPLUS**. This resource is available on any computer that has internet access (you may have to perform a 'one time only' install of several plug-ins) and students may log-in at **www.wileyplus.com** . Please make sure that you have purchased the correct textbook for this course. Further information regarding WileyPLUS registration will be provided at my Learning Web page which is located at

http://learning.hccs.edu/faculty/timor.sever .

Syllabus Policy

Students are expected and required to read and understand the policies contained in this syllabus. Any questions concerning the syllabus must be brought to the instructor's attention no later than **08/30/12.** In particular, any errors are subject to correction.

Testing Center Protocols

The quizzes and homework assignments for this course are administered on-line and may be taken at a location of your convenience. ***In regards to the academic integrity of this course, it will be the case that some of the examinations including the Final Exam will administered online at an HCC Testing Center***. The **Course Calendar** (PDF file) contained in the WileyPLUS software will clearly indicate which examinations MUST be taken at the testing center. Further, a PDF file regarding Testing Center locations and other pertinent information has been uploaded into the software as well. Please familiarize yourself with these dates and times ASAP and mark your calendars accordingly.

Personal Communication Device Policy:

All personal communication devices (any device with communication capabilities including but not limited to cell phones, blackberries, pagers, cameras, palmtop computers, lap tops, PDA's, radios, headsets, portable fax machines, recorders, organizers, databanks, and electronic dictionaries or translators) must be muted or turned off during testing. Such activity during testing time is deemed to be disruptive to the academic process. Personal communication devices are to not be on the student desk during examinations. Usage of such devices during exams is expressly prohibited during examinations and will be considered cheating (see academic honesty section above).

Electronic Devices Policy

Any device having a QWERTY keypad arrangement similar to a typewriter or keyboard or other typewriter-like keyboards or keypads are prohibited (e.g., Dvorak et. al.). Devices with communication capabilities are prohibited. These include but are not limited to cameras; cell phones; desktop, hand-help, laptop, and palmtop computers; databanks; data collectors; organizers; pagers or beepers; PDAs; radios; headsets; tape players; portable fax machines; reproduction equipment; electronic dictionaries; electronic translators; and recorders.

Calculator Policy

At this time, you may use any calculator of your choosing (subject to the previously stated Electronic Devices Policy). Cell phones may not be used as calculators. Calculators that make noise, have paper tape, need to be plugged in or talk are prohibited unless these specific calculators are required as an accommodation (Please refer to the accommodations section of the Student Handbook.). The sharing of calculators by students during an examination session is strictly prohibited.

If an unapproved calculator or electronic device is found in your possession after the examination begins, then you will be dismissed from the examination room and your examination will not be scored.

Disclaimer

This section, regarding Testing Center Protocols, is intended to be a general description of what is not allowed. It is not intended to be an exhaustive list of specific calculators, devices or technologies that cannot be used during the examinations administered at a testing center. As technology advances and/or changes, this policy will be reviewed and may also change. If you have any specific questions regarding an electronic device or calculating device, please contact your instructor before you begin your examination.

Student Course Reinstatement Policy:

Students have a responsibility to arrange payment for their classes when they register, either through cash, credit card, financial aid, or the installment plan. Faculty members have a responsibility to check their class rolls regularly, especially during the early weeks of a term, and reconcile the official class roll to ensure that no one is attending class whose name does not appear on it. Students who are dropped from their courses for nonpayment of tuition and fees who request reinstatement after the official date of record (OE Date) can be reinstated by making payment in full and paying an additional $75 per course reinstatement fee. A student requesting reinstatement should present the registrar with a completed **Enrollment Authorization Form** with the signature of the instructor, department chair, or dean who should verify that the student has been attending class regularly. Students who are reinstated are responsible for all course policies and procedures, including attendance requirements.

Resources:

Free tutoring is available in **JDB 300** at Central College**.** Additional help is also available through Student Support Services. Students can get free assistance, 24 hours a day, 7 days a week, in Math, English and other subjects, at **www.hccs.askonline.net**. Typically, posted questions are answered by an HCC tutor or faculty within 24 hours (usually under 6 hours). There are also several online math resources that you can find with an internet search. You may also find information on the Learning Web site accessible through your specific HCCS campus website.