Course Syllabus for Math 21 – Linear Algebra, Summer Session I 2018, UCSC

Instructor Information:

Name:	**Natalya Jackson**
Email:	**nljackso@ucsc.edu**
Lecture:	**Tues/Thurs, 9:00am – 12:30pm, PhySci 114**
Office Hours:	**Tues/Thurs, 1:00pm – 2:00pm, McH 1292**

TA Information:

Name:	**Xu Gao**
Email:	**xgao26@ucsc.edu**
Section:	**Mon/Wed, 10:00am – 11:00am, PhySci 140**
Office Hours:	**Mon/Wed, 11:30am – 12:30pm, McH 4117**

Textbook Information:

Title:	*Elementary Linear Algebra, an eText (Fourth Edition)*
Author:	Bruce Cooperstein
Purchase Link:	http://www.lulu.com/shop/bruce-cooperstein/elementary-linear-algebra/ebook/product-23019023.html

Course Objectives:

Although there are many algorithmic computations you will be expected to learn and perform accurately (such as Gaussian elimination, determinants via cofactor expansion, and change of basis, to name just a few), the emphasis of this course is on the conceptual framework required to critically analyze a variety of problems to which the computations of linear algebra can be applied. As you internalize the logical progression of definitions and theorems, you will gain the ability to use the information given in a problem to determine the appropriate computation to perform, as well as the conceptual understanding required to accurately and contextually interpret the results of the computation to answer the question which was posed. Additionally, you will cultivate understanding of the geometric interpretation of the concepts by actively engaging with the material from a variety of perspectives.

Grading:

Final letter grades will be given based on the percentage of total available points students earn during the course, with the usual standard cutoffs. There are 400 total available points, distributed as indicated. Each of these opportunities to earn points toward your grade has a short description below.

20 points	(5%)	Definitions and Theorems Journal
60 points	(15%)	Quizzes
80 points	(20%)	Homework
100 points	(25%)	Midterm Exam
140 points	(35%)	Final Exam
TOTAL:	**400 points**	**(100%)**

Defintions and Theorems Journal:

This is many students' first encounter with a mathematics course which relies heavily on the logical progression of definitions and theorems. As you read the assigned portions of the textbook before coming to class, write down the definitions and theorems from those sections. You can find a list of which sections to read (and write down definitions and theorems from) before each class in the Tentative Schedule of Topics, and also by clicking a "lecture event" on the Syllabus page in Canvas. I will choose four lectures at random to check your Defintions and Theorems Journal, and you will receive 5 points if it is up to date with the ones assigned so far, for a total of 20 points possible (5% of your grade).

This assignment serves three purposes:
- Emphasizes the importance of definitions and theorems to the course;
- Helps you learn the definitions and theorems by writing them out in your own writing;
- Saves precious minutes of lecture time in this fast-paced course.

Quizzes:

There will be a short quiz at the beginning of every lecture, not including the days of the midterm exam and the final exam, *but this **does** include the first lecture.* The first quiz will cover the information contained in the syllabus, as well as reviewing some basic prerequisites. Subsequent quizzes will focus primarily on definitions; however, some brief computations or geometric interpretations may be included as well.

Homework:

Homework assignments will be available on Canvas after each lecture. Completed homework will be collected weekly on Tuesdays at the beginning of lecture, with the exception of the last homework set, which will be collected before the final exam. Homework points will be awarded based on completeness only. However, most of your exam questions will be taken (directly or indirectly) from the homework, so it is in your best interest to be sure you are able to complete the problems correctly. Pay close attention to the "non-computational" homework problems, which are designed to reinforce concepts and allow you to practice effectively communicating mathematical ideas.

Midterm Exam:

The Midterm Exam will be held at the beginning of our usual lecture time on Tuesday, July 10th, covering the assigned topics in Chapters 1-3. There will not be a Quiz the day of the Midterm Exam, but you will turn in Homework 3 and Homework 4 when you arrive on this day. *Due to time constraints, there will be a shortened lecture immediately following the midterm.*

Final Exam:

The Final Exam will be held during our usual lecture time on Thursday, July 26th. The Final Exam will be cumulative, but will more heavily emphasize material which was not covered on the Midterm Exam. There will not be a Quiz the day of the Final Exam, but you will turn in Homework 9 when you arrive on this day.

Tentative Schedule of Topics:

Day	Date	Topics	**Sections of eTextbook to read before lecture, completing your Definitions and Theorems Journal as you do the reading (subject to revision)**
Tuesday	6/26	Linear systems, matrices, echelon forms, vectors and the space R^n	1.1, 1.2, 2.2
Thursday	6/28	Span and linear independence in R^n, subspaces and bases in R^n, dimension	2.3, 2.4, 2.5
Tuesday	7/3	Dot product, linear transformations, product of a matrix and a vector	2.6, 3.1, 3.2
Thursday	7/5	Matrix addition and multiplication, invertible matrices, elementary matrices	3.3, 3.4, 3.5
Tuesday	7/10	MIDTERM and determinants	4.1, 4.2 (shortened lecture following MIDTERM)
Thursday	7/12	Abstract vector spaces – span, independence, bases, coordinates	5.1, 5.2, 5.3, 5.4
Tuesday	7/17	Change of basis, rank and nullity, linear transformations of abstract vector spaces	5.4, 5.5, 6.1
Thursday	7/19	Kernel/range/matrix of a linear transformation, eigenvalues/eigenvectors	6.2, 6.3, 7.1
Tuesday	7/24	Diagonalization, more on orthogonality, distance-preserving linear transformations	7.2, 8.1, 8.3
Thursday	7/26	FINAL EXAM	FINAL EXAM

Getting Help:

There are many resources available to help you succeed in this course. Attending section regularly, as well as the office hours for both the instructor and the TA, provide opportunities to actively engage with the material. Additionally, small group tutoring is available through Learning Support Services. Please visit https://lss.ucsc.edu for more information.

<u>Policy Regarding Late or Missed Assignments:</u>

Definitions/Theorems Journal: Missed points on a "random check" day can only be made up if the points are missed due to absence ***<u>with a doctor's note</u>***.

Homework: If you are absent ***<u>with a doctor's note</u>*** the day a homework assignment is due, you may turn it in at the next lecture. Otherwise, no late homework will be accepted.

Quizzes/Exams: If you are absent ***<u>with a doctor's note</u>*** you may email me to make arrangements for a makeup quiz/exam. Quizzes/exams may not be made up for other reasons.

<u>General Information:</u>

Summer Session I 2018 Deadlines:

Drop: Monday, July 2
Withdraw: Friday, July 13

Neither Summer Session nor instructors drop students for non-attendance or non-payment. Students must drop themselves. Dropping results in full tuition reversal/refund. Withdraw posts a W for the grade and full tuition is charged (no refund).

For all dates and deadlines, including 'change of grade option' (P/NP) and grades due, here is the summer academic calendar – https://summer.ucsc.edu/fundamentals/academic-calendar.html

DRC Accommodations:

Personal Message from the Instructor: "My goal is for this class to be an inclusive and supportive learning environment for all students. Please contact me by email as soon as possible if you require accommodations for quizzes and/or exams, or if you have any other concerns regarding accommodations or any other aspect of the course."

The Disability Resources Center reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. If you have questions or concerns about exam accommodations, or any other disability-related matter, please contact the DRC office, located in Hahn 125 or at 831-459-2089 or drc@ucsc.edu.

Academic Dishonesty:

Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree.

All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC.

In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript.

For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the [Academic Integrity page](#) at the [Division of Undergraduate Education](#).

Title IX:

The university cherishes the free and open exchange of ideas and enlargement of knowledge. To maintain this freedom and openness requires objectivity, mutual trust, and confidence; it requires the absence of coercion, intimidation, or exploitation. The principal responsibility for maintaining these conditions must rest upon those members of the university community who exercise most authority and leadership: faculty, managers, and supervisors.

The university has therefore instituted a number of measures designed to protect its community from sex discrimination, sexual harassment, sexual violence, and other related prohibited conduct. Information, advice, referrals, and/or copies of the UC Policy on Sexual Violence and Sexual Harassment and the UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment are available to all students, faculty, and staff by contacting Tracey Tsugawa, Title IX/Sexual Harassment Officer, 105 Kerr Hall, 459-2462, or ttsugawa@ucsc.edu.