Contact

Instructor: Park Lee, Young Hee, Ph.D.

Office: 4111 (not available)

Email: parkleeyounghee@foothill.edu

Phone: 650-949-7560 (not available)

Office Hours: via Zoom

https://fhda-edu.zoom.us/j/99633421473

Tuesdays　　　　　4 PM – 6 PM

Please visit me during my virtual office hours as often as possible since that is the best way for you and me to understand each other and work together for your success in this course. If the above hours don't fit your schedule and you need to see me, then let me know. I will try to find a way to virtually accommodate your request.

DRC: Students with disabilities who may need accommodations for this class are encouraged to notify me and contact the Disability Resource Center (DRC) early in the quarter so that reasonable accommodations may be implemented as soon as possible. For more information, please visit the DRC website,, https://foothill.edu/drc/ and the Virtual Campus Student Support website, https://foothill.edu/onlinelearning/students/student-virtual-campus.html.

Due to the nature of the course, there are complex graphics, images, and equations that may not be fully accessible. Students who have difficulty with any content are encouraged to work with the DRC.

Basics of the Course

This course is UC/CSU transferable, and required for the A.S. degree in Mathematics.

Prerequisite: MATH1C

Advisory: Demonstrated proficiency in English by placement as determined by score on the English placement test OR through an equivalent placement process OR completion of ESLL 125 & ESLL 249.

Textbook: Linear Algebra and its Applications, by David C. Lay, 5th Ed., 2016, Pearson
ISBN-13: 9780134013473 (e-book)
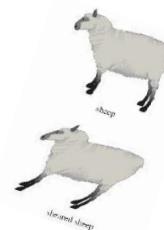
Calculator: Except by permission of the instructor, the math department generally does not allow calculators capable of symbolic manipulation (i.e. CAS) on in-class written assessments. This includes calculators capable of storing programs that essentially turn the calculator into a CAS/symbolic machine. No calculator is needed and required for this course.

Course Objectives and Learning Outcomes
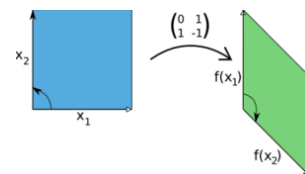
Course Objectives: The student will be able to

A. Solve linear systems using various methods in Linear Algebra, and analyze the systems.
B. Demonstrate an understanding of matrix operations, their properties, and various characterizations of invertible matrices including the Invertible Matrix Theorem.
C. Evaluate the determinant and demonstrate an understanding of its properties.
D. Demonstrate an understanding of vector spaces and subspaces, identify those spaces and understand their characterizations.
E. Demonstrate an understanding of eigenvectors, eigenvalues, and their usage in many fields.
F. Demonstrate an understanding of an orthogonal projection of a vector onto a subspace, and solve related problems in Linear Algebra.
G. Write linear systems to model phenomena from various real-life problems, and discuss their solutions to demonstrate an understanding of applications of Linear Algebra.
H. Prove various theorems/results involving any of the topics in (A) through (F) above using accurate mathematical language and notation to communicate arguments clearly.
I. Use technology such as graphing calculators and/or computer software to assist in solving problems involving any of the topics in (A) through (G) above.
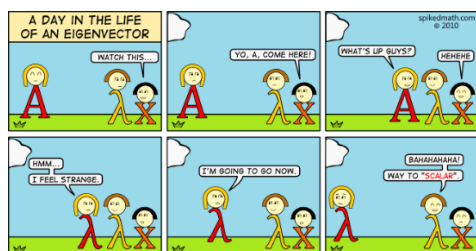
Student Learning Outcomes:

After successfully completing this course, the student will be able to:

1. Students will develop conceptual understanding of the four major problems in introductory linear algebra: the matrix-multiplication problem, the linear systems problem, the least-squares problem, and the eigenvalue/eigenvector problem. Students will demonstrate and communicate this understanding by reasoning with definitions and theorems and connecting concepts.
2. Students will solve each of the major problems (the matrix-multiplication problem, the linear systems problem, the least-squares problem, and the eigenvalue/eigenvector problem) using appropriate methods.
3. Students will be able to create, interpret, analyze, and discuss mathematical models of physical problems using linear algebraic techniques.

Virtual Attendance/Participation

Out of respect for yourself, your classmates and me,

please arrive to virtual Zoom class in Canvas on time.

1. Students are expected to maintain regular and prompt attendance and participate in all class activities unless absent because of a genuine emergency, illness, college-related activity, etc.
2. When you take a class, daily attendance is important to your understanding of the material covered.
3. It is the student's responsibility to officially drop a class. You are responsible for initiating your own drops. Don't assume that I will drop you if you do not attend classes. However, I do reserve the right to drop any student who is disruptive by being late, or consistently absent. Please inform me if you decide drop this class. There are specific deadlines for dropping a course. See details on Foothill's MyPortal.
4. If you miss a class, it is your responsibility to keep up with the material and obtain handouts that you may have missed.
5. Please visit my virtual office hours if needed.
6. Please visit the Virtual Campus Student Support website if needed.

Student Services and Support

The followings are some resources and services we virtually offer in this unprecedented time.

https://www.foothill.edu/virtualcampus/

https://foothill.edu/onlinelearning/students/student-virtual-campus.html

https://foothill.edu/handbook/

Testing Accommodations

If you need accommodated testing services, please schedule your testing appointment via Clockwork. Exams must be scheduled three (3) business days in advance. Finals exams must be scheduled seven (7) business days in advance. Failure to meet appointment booking deadlines will result in the forfeit of testing accommodations and the student will be required to take their exam in class.

Previews and Reviews

This practice is the most efficient way to use your time for study and the most effective way to understand the class materials. **Collaboration** with your classmates is strongly encouraged in doing homework.

PREVIEW

There is a preview reading homework assignment for every week. See the course calendar for the sections we are going to learn each week. This preview assignment is for you to read the sections beforehand.

Please understand that doing homework is for your sake, not for mine. The purposes of doing the preview homework are for you to get familiar with what you are going to learn, to engage yourself more in class, to motivate yourself, to develop study habits, and so on. Having some ideas on a topic that we are going to cover in advance, helps you understand what is going on in class.

Full Attention and Participation in Class

REVIEW

There is a preview homework assignment every section. See the suggested homework list.

This review homework from the textbook is neither collected nor graded. But some homework problems may show up in a test.

The review homework is also just as important to you as the preview homework. The purposes of doing the review homework are to reinforce and practice what you have learned, to see whether you have learned the concept correctly, and to develop study habits.

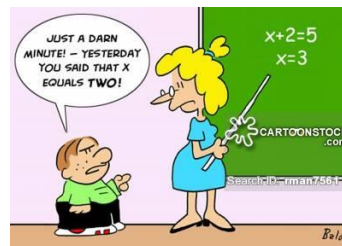Students are expected to try their best before bringing the problems to the class due to class time constraint.

When you are stuck

that is the time you need to run one more lap to make a progress and grow!

Studying a new course is exciting! You expect to understand new ideas and concepts, to grow with academic comprehension, and to apply those into your major and further studies. How thrilling it could be! However, as there is no gain without pain, you might encounter difficulties from time to time when you study new materials. The following is what I suggest for you to consider doing, and I believe it is worth your effort.

Three Before Me

This is a rule that asks you to try three different resources to understand a concept and/or solve a problem before you ask me to explain. Please do not misunderstand my intension of holding this rule. I have carefully adopted this rule based on my own experiences from both a student and an educator. Even though you are welcomed to ask me problems directly, I recommend you to follow the rule. While you practice the rule, you will learn more through different tries/resources, get empowered in your own study, and possibly see the beauty of mathematics which gives you 'aha' moments!

The Online STEM Center

The Online STEM Center is offering drop-in tutoring online via ZOOM. Our instructors are scheduled throughout the day to help you one-on-one. Don't be stuck or fall behind. Take advantage of this wonderful free service Foothill College makes available to all students. We hope to see you soon!

Students can access information about the Online STEM Center in 2 ways:

1. Click the Student Support Portal via CANVAS, Click "Go to Tutoring" on Tutoring Tile
2. Click "Foothill Tutoring" menu option in your CANVAS course

How can we help each other's learning?

Everyone respects others!

That is the only one classroom rule if you have me as an instructor. I expect you to respect yourself, your classmates and me during class. However, there might be more you could think of in order to support each other in class. Let's think about how you and I can contribute to keep the class atmosphere at a constructive and safe place to study and work. On the first day of the course, there will be a conversation between all of us to make a healthy learning environment in class. The class will make a list of the ways on how to help each other's learning, and select some of them that most of the class agree on for a "student-generated how-to-help list".

To protect everyone's right to learn in this course, disruptive behaviors are not invited.

I have to and will follow and conduct the College Disciplinary Action if needed.

Academic Honesty

Honor YOURSELF!

The Academic Honor Code assumes that all students will pursue their studies with integrity and honesty. When students violate the honor code, a process is begun that may result in severe consequences. Incidents of cheating are taken very seriously at Foothill. Cheating is absolutely forbidden in class! (and elsewhere too…) Cheating incidents (such as looking at someone else's exam, helping another student during an exam, talking to anyone except me during an exam, or using an external source of information for which you were not explicitly given permission, etc.) will be reported to the Dean of PSME and the Dean of Student Affairs & Activities. Please refer to 'The Foothill College Academic Honor Code' in the website https://foothill.edu/handbook/

You can also find the Z-card for 'Academic Integrity at Foothill College' at the website https://foothill.edu/services/documents/Z-Card.pdf.

Celebration of struggles, hard work, and academic growth

Have you ever waited so badly to show off how much you had enjoyed learning and how much you had actually learned?

You have the following opportunities to do so. Please expect struggles and challenges when you learn new things. If you don't experience any difficulties while you learn something new, you may want to ask yourself whether you're actually learning or not.

SHOW-OFF YOUR AUTHENTIC LOVE OF LEARNING

Please think about your goals and reasons for taking this course. I would like to give you opportunities to share your love of learning the course material. There are several ways to show ownership in your learning. You can ask relevant questions in class, visit my office hours to clarify concepts, explain what challenges you, demonstrate a proactive desire to learn, actively participate in any discussions, collaborate with your group members, learn from and teach each other during group discussions, and share your understandings or questions from pre-reading. If you find it difficult to demonstrate these traits, please feel free to come to my virtual office hours so we can brainstorm creative ways for you to demonstrate these traits. I respect different ways of learning, and would like to empower you in your education.

IN-CLASS ACTIVITY

In-Class Activities are available throughout the quarter. The activity problem will be associated with important concepts delivered in that class's lecture. I strongly suggest that you read the section before I cover it in class, and try to solve the activity problems before you come to class (in other words, preview). You will have more 'Hmmm' moments rather than 'Aha!' moments when you preview and try solving the problems. Don't worry! Please bring those questions to class in order to figure it out together.

HONOR YOURSELF CREDIT (5%)

Please refer to the Canvas course site in regard to the due date for this assignment.

INTRODUCE YOURSELF CREDIT (5%)

Please make a one-minute video that introduces yourself, and submit the video. Please refer to the Canvas course site in regard to the due date for this assignment.

YOUR CHAPTER KNOWLEDGE CHECK (75%)

You will be given a set of problems for each chapter. This individual assessment will be posted in the Canvas course site. Please refer to the site in regard to due dates for these assessments.

YOUR COURSE FINALE (15%)

There will be a comprehensive assessment. Please refer to the site in regard to due date for this assessment.

Course grade

You will earn a course grade based on your performance of the criteria stated above.

97%-100%: **A+**

90%-96.9%: **A**

87%-89.9%: **B+**

80%-86.9%: **B**

77%-79.9%: **C+**

70%-76.9%: **C**

60%-69.9%: **D**

-59.9%: **F**

Why am I here?

Because you are here and YOU are our future!

Math became my first love when I was young, and I have been enjoying doing math myself and teaching math ever since. I have had a lot of experiences in learning, doing research, and teaching mathematics as both a student and a professor. Teaching math and being a caring educator has always been my passion. I want to inspire young people for their goals and futures while they do math with me. I also want you to see and feel the beauties of math during the course. You will see that math should not be thought of as a tough subject, but it can be an enjoyable and beautiful subject. Once you finish this course successfully, you will be ready for the next level of math. If you have any difficulties in this class, please feel free to ask me as soon as possible. I will do my absolute best for your success since your success is my success! Thank you for being my math scholar this quarter.

Image Citation

https://www.pearsonhighered.com/program/Lay-Linear-Algebra-and-Its-Applications-plus-New-My-Math-Lab-with-Pearson-e-Text-Access-Card-Package-5th-Edition/PGM158520.html

http://math.illinois.edu/~ruthluo2/sheep.jpg

https://i0.wp.com/upload.wikimedia.org/wikipedia/commons/thumb/c/c1/Determinant_Example.png/300px-Determinant_Example.png

https://mathsci2.appstate.edu/~sjg/class/2240/242-a-day-in-the-life-of-an-eigenvector.png

https://suedesofa.files.wordpress.com/2011/06/what-if1.jpg

http://www.missfarah.com/wp-content/uploads/2010/09/my-dog-ate-my-homework.jpg

https://s3.amazonaws.com/lowres.cartoonstock.com/animals-school-teaching-grammar_school-homework-homework_excuses-jhan342_low.jpg

http://3.bp.blogspot.com/-8OwyExk57g4/Vd02P2rTLjI/AAAAAAAAA3E/AGcL8XgDNPA/s1600/Homework.gif

https://s3.amazonaws.com/lowres.cartoonstock.com/children-kid-school-schooling-pupils-school_kids-rman7561_low.jpg

https://www.foothill.edu/tlc/images/tlc.sml1.jpg

https://www.foothill.edu/services/torch/images/torch.jpg

https://www.foothill.edu/services/eops/images/eops1.2.jpg

https://s-media-cache-ak0.pinimg.com/236x/22/04/9d/22049d88e243887e84391feda43134b2.jpg

http://foh.psc.gov/eapnews/consortium/images/officeE.jpg

http://www.amerinursery.com/wp-content/uploads/2016/04/did-you-know.jpg

http://foothill.edu/news/images/20131212111223.png

http://spikedmath.com/comics/577-cosy-function.png

http://www.sis4teachers.org/wp-content/uploads/2016/07/Kid-Friendly-8-Mathematical-Practice-Posters.png

http://www.lovethispic.com/uploaded_images/171569-Work-Hard-Now-It-ll-Pay-Off-Later.jpg

Suggested Homework Assignments

These problems are neither collected nor graded. Successful students do the reading and at least some of the homework problems before the lecture on that topic. We will discuss some homework problems at class**.**

5th Edition

1.1	1, 3, 4, 7, 10, 11, 13-15, 17, 19, 22-25, 29, 33, 34
1.2	1, 3-5, 7, 11, 14-17, 20-27, 29, 31, 33, 34
1.3	1, 4, 5, 7-9, 11-21, 23-29, 31, 32
1.4	1, 4-6, 8, 9, 11, 13-15, 17-21, 23-25, 28, 31-36
1.5	1, 3, 5, 7, 8, 13-15, 17, 19, 21-35
1.6	1, 2, 3, 6, 7, 11-14
1.7	1, 4-6, 9, 11, 15, 16, 20-31, 33-40
1.8	1-4, 7-9, 11, 13-17, 19, 21, 22, 25-36
1.9	1-10, 13, 15, 17-25, 31, 32, 34, 35
1.10	1, 2, 7, 9, 11, 14
2.1	1, 3, 5, 7, 9-11, 13, 15-21, 23, 27, 28, 31, 33
2.2	1, 4, 5, 7, 9-11, 13, 14, 16, 17, 21-23, 25, 29, 31, 35, 38
2.3	1, 3, 5, 7, 11-19, 21-24, 28, 33, 34
3.1	1, 2, 9, 10, 13, 15, 19-30, 38-41
3.2	1-5, 7, 11, 15-21, 25, 27-29, 31, 32, 34, 36, 39
3.3	1, 5, 7, 11, 19, 21, 23, 30
4.1	1-24, 31, 32
4.2	1, 3, 5, 7-9, 12, 13, 15, 17, 19, 21, 23, 25-27, 30-34
4.3	1, 3, 5, 6, 8, 9, 11-13, 15, 19-25, 28-30, 33, 34
4.4	1, 3, 5, 7, 9, 11, 13, 15-17, 19, 23, 24, 27-29, 32
4.5	1, 4, 7-11, 13, 15, 16, 18-20, 22, 24-26, 29, 30
4.6	1, 3, 5-18, 21, 23-25, 27-29
4.7	1, 3, 5, 7, 9, 11-13
4.9	1-5, 7, 11-14
5.1	1-4, 7-10, 13-23, 25-27, 33
5.2	1, 3, 5, 9, 11, 13, 15, 19-22, 25
5.3	1-5, 7, 11, 16, 17, 21-28
6.1	1, 3, 5, 7, 9, 11, 13-16, 19, 20, 22-29, 31
6.2	1, 4-7, 9, 11, 13, 15, 17, 19, 21, 23, 24, 26, 27, 29
6.3	1, 3, 7, 11, 13, 15, 17, 19, 21, 22
6.4	1, 3, 7, 9, 17, 18
6.5	1, 3, 5, 7, 9, 11, 14, 15, 17, 18
6.6	1, 2, 5, 6
6.7	1-3, 5, 7, 9, 15-21, 23, 25

Supplementary Exercises from Chapter 1 to Chapter 6

Tentative Course Calendar

Week Date of Monday	Sections/Concepts to learn	Note
1 01/03	Green sheet & course overview, Introduction, 1.1, 1.2, 1.3	
2 01/10	1.4, 1.5, 1.6, 1.7	
3 01/17	1.8, 1.9	**No Class** **on 01/17 (M)**
4 01/24	2.1, 2.2, 2.3, 3.1, 3.2	
5 01/31	3.3, 4.1	
6 02/07	4.2, 4.3, 4.4	
7 02/14	4.5, 4.6, 4.7	
8 02/21	4.9, 5.1	**No Class** **on 02/21 (M)**
9 02/28	5.2, 5.3, 6.1, 6.2,	
10 03/07	6.3, 6.4, 6.5	
11 03/14	6.6, 6.7, Review	
12 03/21	Course Finale	