W22 MATH D002B 08Z Linear Algebra Syllabus

Course Description:

Linear algebra and selected topics of mathematical analysis.

Course Content:

- Solve and analyze systems of linear equations using matrices and matrix theory
- Investigate special matrices and matrix operations including powers and factorization
- Develop understanding and use of n-dimensional vectors and vector operations
- Define and investigate vector spaces and vector sub-spaces and find their bases and dimensions
- Establish understanding of linear transformations and their geometry and find their matrix representation
- Define eigenvalues and eigenvectors and use them to diagonalize square matrices and solve related problems
- Utilize methods of linear algebra to solve application problems selected from engineering, science and related fields
- Prove basic results in linear algebra using appropriate proof-writing techniques

---

Important Notes about Online Learning:

- **Communication**: You can contact me via email (bambhaniadoli@fhda.edu) or via Canvas message. You can expect a response within 24 hours on weekdays and within 48 hours on the weekend. If you don't get a reply back to your email, try Canvas message, and the vice versa.
- **Engagement**: Since we are conducting the class fully online, I will look for your engagement through participation during synchronous sessions, and through the submission of assignments. Be sure to submit all first week and second week assignments to get into the "rhythm" of the class. Please note that if you're not submitting any assignments during the first two weeks of class, I will assume that you are not interested in the taking the class and may drop you!
- **Feedback**: Any feedback on your discussions, problem sets and written parts of exams will be provided as annotation or assignment comment in Canvas. If you need additional feedback regarding grading (especially automatically graded items such as homework and quizzes), please email/message me directly about that assessment. I will aim to grade all items within 1-2 days of submission, but you can expect assignments and assessments to be graded within 1 week of submission.

If, for any reason, you stop participating and intend to drop the class, please do an official drop in a timely manner. If you fail to do so, you will receive an 'F' in the class. Follow the deadlines for this class in My Portal. I do not have the ability to make exceptions to these.

Textbook and Calculator:

Great news: your textbook for this class is available for **free** online!
A First Course in Linear Algebra (Links to an external site.)

You will need a scientific calculator, and occasionally a matrix calculator, for this class. This can be a physical or an online app, such as the one at Desmos (Links to an external site.).

Prepared Lecture Notes:

The content for this class will be delivered during synchronous sessions Monday through Friday, 10:30-11:20am. The PDFs for prepared lecture notes will be shared with you. You can find both in Modules under weekly activities. These are designed to help you keep your lecture notes organized. Please print the prepared lecture notes, or open them on a tablet if you have the ability to annotate electronically. During lectures, take notes on these! Keep all your notes organized in a binder. I strongly recommend that you do this. If you don't have access to a printer or a tablet, then simply take notes in a regular notebook, as you would in any other class.

Weekly Schedule:

- **Monday through Friday**: We will have synchronous Zoom meetings 10:30-11:20am. The link can be found in the Zoom tab in Canvas. The **passcode** is**: linalg.** You're expected to attend each of these meetings.

Office Hours:

- Mondays and Wednesdays 9:15 - 10:15 a.m. (Zoom link: https://fhda-edu.zoom.us/j/94347506117 (Links to an external site.))
- Tuesdays and Thursdays 12:30 - 1:30 p.m. (Zoom link: https://fhda-edu.zoom.us/j/92923524526 (Links to an external site.))
- Or, by appointment (email me to schedule)

Homework and Problem Sets

The best way to succeed in any math class is to do all of the assigned work correctly and in a timely manner, making sure you really understand what you are doing! Focus on how to think mathematically about problems, not just on following a procedure! Time spent on the homework and problem sets will directly benefit you on quizzes and exams.

Online Homework: You will have online homework for each section we cover. The homework uses the free software MyOpenMath, and will be graded for correctness. The links and due dates are within the Canvas Modules, . You will have 2 late passes, each of which will give you a 24-hour extension on the homework for a particular chapter, but will have a 5% penalty.

Problem Sets: Each week (except Week 11), we will have a problem set that you will work on. These problems will be posted as a PDF in the Canvas modules.

Problem Sets Submission Guidelines:

- *Even though you are welcome to discuss the problems with your classmates, write up your own solutions independently.* ***Never*** *copy anyone's work for any reason!*
- *Label each problem clearly – use a* ***highlighter*** *to mark the number, or put a* ***box*** *around it so it's easy to find. You don't need to write the question, just fully-worked out solutions.*
- *Leave some white space around the problem for comments.*
- *Do the problems in* ***order****, showing all work neatly, clearly and completely.*
- *Write your solutions out in full detail, as modeled in the textbook and in lectures. It's important to write up problem sets neatly, showing all work, and explaining the logic behind each step.*
- *Submit a* ***single*** *PDF document, NOT multiple images. Use the Notes app on iOS, or a scanning app such as Adobe Scan or Genius Scan (both free), or something else from among many options. Be sure to check that your scanned copy is legible and has correct orientation. I will need to be able to read it for you to get points.*
- *Problem sets are due on Fridays at 11:59pm. You can have a 24-hour* ***extension*** *with 10% penalty.*

Discussions:

Occasionally, we will have Canvas discussions in this class. Other than the first discussion, which is designed to help you get to know one another, discussions are designed to deepen your understanding of the material in this class.

Participation:

Even though this is an online class, you are expected to actively participate. I expect you to:

- Ask and answer questions during the synchronous portions of our class. You can raise your hand to speak, or use the chat feature in Zoom.
- Outside of class, post and answer questions in 'Questions Discussion Board' (1 point extra credit for posting or answering a question, up to a maximum of 5 for the quarter).

Quizzes:

We will have **eight** 20-minute quizzes (see the calendar at the bottom of this page). These will usually be similar to your online homework. We will do them during the synchronous portion of class. *IMPORTANT: Generally speaking, there will be NO MAKEUPS for any of the quizzes, and your lowest quiz score will be dropped. If you're dealing with an unexpected issue, you're welcome to reach out to me. I will see what I can do to help.*

Exams:

We will have **two** midterm exams, and a cumulative final exam. See the calendar for the dates. Exams must be taken at the scheduled time, so pay careful attention to their dates and times. The exams will contain an online portion and a written portion. The written portion will need to be done on paper and scanned (or on a tablet) and submitted by the exam closing time *IMPORTANT: There will be NO MAKEUPS for any of the exams.*

NOTE: In case of an unforeseen emergency or illness due to which you cannot take an exam, please get in touch with me immediately, and I can work with you to find a solution. If this happens for the final exam, that may result in an 'Incomplete', provided that you supply me with a sufficient proof.

Evaluation:

Your final grade will be computed as follows:

Point Values of Assignments and Assessments

Category		**Points**
Homework	7 @ 10 points each	70
Problem Sets	10 @ 10 points each	100
Weekly Discussions	Top 5 @ 10 points each	50
Project		35
Quizzes	Top 7 @ 15 points each	105
Exams	2 @ 70 points each	140
Final Exam		100

TOTAL	**600**

Letter Grade based on Overall Percentage	
Overall percentage	**Your grade will be at least**
97 % or greater	A+
92% to less than 97%	A
89% to less than 92%	A-
87% to less than 89%	B+
82% to less than 87%	B
79% to less than 82%	B-
75% to less than 79%	C+
70% to less than 75%	C
55% to less than 70%	D
less than 55%	F

Help:

1. Your classmates are a great resource. Ask for help and provide help to others either within your current groups or using Canvas discussion boards!
2. Message me through Canvas with questions or attend office hours. For online homework questions, message me by using 'Message Instructor' button in the problem.
3. Ask questions during our synchronous meetings.
4. Get help from De Anza's Math Student Success Center. See details at http://deanza.edu/studentsuccess/.
5. Use NetTutor for help through Canvas.
6. If you need any technical help with MyPortal, Zoom, Canvas, etc., visit https://www.deanza.edu/online-winter/#Learning (Links to an external site.).
7. On the link above, under 'Student Services and Support', you will find links to services with some specific to this time, such as for help with tech equipment, food and financial assistance, health services, resources for undocumented students, etc.

Academic Integrity:

All students are expected to exercise academic integrity throughout the term. Any instances of cheating or plagiarism will result in disciplinary action, including at minimum, 0 on the assignment or assessment, but may include recommendation for dismissal. You are encouraged to work together on homework but simply copying down from someone else's work is wrong!

Cheating on a quiz or an exam is more serious. It will certainly result in getting a 0 on the assessment, but could result in getting an 'F' in the course or dismissal from the class. Also, each incident of cheating will be reported to the Dean of the Physical Science, Mathematics and Engineering Division and the Office of Student Development. Please see the De Anza College's page on Academic Integrity: https://www.deanza.edu/policies/academic_integrity.html (Links to an external site.). Check out this video produced by De Anza College on this topic: https://www.youtube.com/watch?v=4unoOe-I0eY (Links to an external site.).

A note about Discord: I encourage you to ask and answer questions amongst yourselves to strengthen your understanding of topics in this class using any medium, including Canvas discussion boards and Discord. However, be careful that you don't compromise your academic integrity or entice others to compromise theirs! For example, never answer a classmate's question about a homework problem by providing a complete, fully worked out solution! There are at least two reasons for this: 1) It would create too much of a temptation to copy - not necessarily for the original question poster but other classmates; and 2) Your solution could be incorrect, in which case you would be hindering the class' understanding of the involved concepts and skills. It goes without saying that you should also never discuss anything during a quiz or an exam on Discord or any medium, even after the quiz/exam has been submitted. Some students may have a special accommodation (due to disability, for example) that allows them to have a later submission time. Discussing solutions while their exam is open would compromise the integrity of their submission.

Disability Notice:

If you feel that you may need an accommodation based on the impact of a disability, please contact me privately to discuss your specific needs. Also, please contact Disability Support Programs & Services through https://www.deanza.edu/dsps/ (Links to an external site.) for information or questions about eligibility, services and accommodations for physical, psychological or learning disabilities.

Tips for Success:

- Taking classes online comes with a set of challenges, such as staying motivated, speaking up in class, conflicts with work and other responsibilities, working with classmates, getting help, feeling a sense of community with the class, the lack of ideal workspace, and technical issues, such as device malfunction or unreliable internet access. About half of all students report 'staying motivated' as their greatest challenge in online learning.
- In any math class, and especially this one, your goal should be to get **ownership** of the material. This means that not only you understand the concepts, and can demonstrate the skills, but also that you can explain them to someone who doesn't have them. The material covered in this class is essential in so many other disciplines, such as

engineering, physics, computer science, statistics, etc. This is not a “learn and forget” class; rather, it's a “learn well so you can succeed going forward” class.

- Here are my recommendations for succeeding in this class in the online setting:

1.
    1. **Log into Canvas every day!** Do some work related to the class every day. Check for upcoming deadlines and make sure you are aware of them.
    2. **Stay on schedule**. Stick to the schedule on the calendar. Don’t fall behind! Be disciplined about this to stay on top of the class. The quarter passes by faster than expected – especially if you’re new to the quarter system – and it’s almost impossible to catch up, so plan accordingly.
    3. **Be fully present in every synchronous session.** Allowing yourself to occasionally miss class, or multi-task during class, is a slippery slope. It can easily turn into a bad habit that can bring undesired outcomes.
    4. **Invite productive struggle.** I am aware that there are many sources that can provide you the answers and even the worked solutions. However, **productive struggle** is essential in learning and retaining the material, and in gaining the confidence in your ability to understand difficult concepts and solve challenging problems.
    5. **Form a study group**. Exchange your contact information with at least 3 other people in the class community. This will come in handy if you need to miss a class, if you want to work with someone on an assignment, or while studying for an exam. This is an **essential college skill**, especially for STEM students.
    6. **Prepare for quizzes and exams as if they were closed-notes assessments.** Even though all quizzes and exams will be open-book, open-notes, prepare as if you were allowed only paper, pencil and calculator. Preparing this way for quizzes will help you retain the material for exams. If you are not prepared well for quizzes and exams, you will likely NOT be able to finish them!
    7. **Don't wait to ask for help!** Whether it’s to your classmates or me, get your questions answered in a timely manner. If you're dealing with an unusual or an unexpected challenge, please let me know so I can work with you to keep the class manageable, if possible.
    8. **Practice personal discipline**! Succeeding in a college class requires **personal discipline**. This is especially true for online classes. It’s quite easy to put things off until later, skip some video lectures, skip taking notes while watching them, distract yourself with social media and other apps while doing class activities, etc. A life skill you should practice this quarter: **Be mindful of what you are giving your attention to.** Think carefully about your priorities, and give the most time and attention to your biggest priorities. When working on your homework, turn off all notifications on your devices, silence your phone and keep it out of immediate reach. Calculus requires focus and it will often challenge you. Don’t put off working on something because it's hard or unpleasant. Learning anything that’s worthwhile requires a sustained effort! And that practice is what ultimately leads to true personal growth.

Math 2B Linear Algebra - Tentative Calendar: Winter 2022

Based on Lyryx's 'A First Course in Linear Algebra' by K. Kuttler

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	3-Jan Introduction 1.1	4-Jan 1.2	5-Jan 1.2	6-Jan 1.2, 2.1	7-Jan Questions **Quiz 1**
Week 2	10-Jan 2.1	11-Jan 2.1	12-Jan 2.2	13-Jan 3.1	14-Jan Questions **Quiz 2**
Week 3	17-Jan *MLK Jr. Holiday*	18-Jan 3.1	19-Jan Review of vectors and operations	20-Jan 4.10	21-Jan Questions **Quiz 3**
Week 4	24-Jan 4.10	25-Jan 4.10	26-Jan 4.10	27-Jan 4.11 Review	28-Jan Questions **Midterm Exam 1**
Week 5	31-Jan 4.11	1-Feb 4.11	2-Feb 5.1, 5.2	3-Feb 5.2, 5.3	4-Feb Questions **Quiz 4**
Week 6	7-Feb 5.4	8-Feb 5.5	9-Feb 5.5, 5.6	10-Feb 5.6	11-Feb Questions **Quiz 5**
Week 7	14-Feb 5.7	15-Feb 5.8	16-Feb 5.9	17-Feb Questions **Quiz 6**	18-Feb *Presidents' Holiday*
Week 8	21-Feb *Presidents' Holiday*	22-Feb 7.1	23-Feb 7.2	24-Feb 7.3	25-Feb Questions **Quiz 7**
Week 9	28-Feb 7.4	1-Mar 9.1	2-Mar 9.1, 9.2	3-Mar 9.3, 9.4	4-Mar Questions **Midterm Exam 2**
Week 10	7-Mar 9.4	8-Mar 9.6	9-Mar 9.8	10-Mar 9.9	11-Mar Questions **Quiz 8**
Week 11	14-Mar Project Presentations	15-Mar Project Presentations	16-Mar Project Presentations	17-Mar Project Presentations	18-Mar Project Presentations
Finals Week	21-Mar	22-Mar	23-Mar	24-Mar **Final Exam** **9:15 - 11:15 a.m**	25-Mar

Student Learning Outcome(s):

*Construct and evaluate linear systems/models to solve application problems.
*Solve problems by deciding upon and applying appropriate algorithms/concepts from linear algebra.
*Apply theoretical principles of linear algebra to define properties of linear transformations, matrices and vector spaces.