Teacher   Dr Neil Course   email: `neil.course@okan.edu.tr`   office: C333

Course Website

You will find course information, handouts, past exams, exam dates, etc. on my website

- `www.neilcourse.co.uk/math215.html`

Required Text

- David C. Lay, Stephen R. Lay and Judi J. McDonald, *Linear Algebra and its Applications*, Global Edition, 5th edition, Pearson.

Note: You **must buy a new copy** of this book **which includes** a *Pearson MyLab and Mastering* access code. Be careful, some books don't have an access code.

Repeating students should already have their access code. If your access code has expired, you must "livechat" with the helpdesk at `yardim.pearson.com.tr` between the times of 10-5 on a weekday. You may chat in either Turkish or English with the helpdesk.

Homework

- website: `pearsonmylabandmastering.com`
- course id: `course61035`

Contents

"The only way to learn mathematics is to do mathematics." – Paul Halmos (1916–2006)
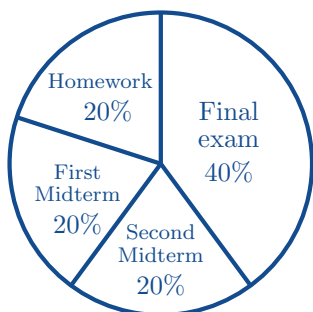
This course has 4 hours of lectures per week. I expect you to spend atleast 8 hours every week, studying outside of class. Every week you should be reading the textbook, attempting the exercise questions in the text book and making use of the homework website.

All of the homework will utilise the MyMathLab website. **It is your responsibility to log in to this website weekly and to complete each piece of homework before its deadline.** The purpose of the homework problems is to help you understand the course material. Obviously I can't help you in the exams, but I am always very happy to give hints to you if you are struggling with a particular homework problem. If the weighted average of your exam scores is less than 20% then your homework hasn't helped you and your homework scores will be set to zero.

Office Hour

If you have any questions, you can find me in my office (C333) each

- Thursday, from 12:00 to 12:30.

Alternatively, you can email your questions to me at `neil.course@okan.edu.tr` . If you do send an email to me, please remember to write either "MATH215" or "Maths 3" or "Linear Algebra" somewhere in your email so that I know which course you are asking about.

Syllabus

Systems of linear equations; Gaussian elimination; matrix and vector algebra; inverse matrix; evaluating determinants; properties of determinants; Cramer's Rule; vector spaces; subspaces; linear independence; basis; row space, column space, and null space; rank; linear transformations; eigenvalues and eigenvectors; diagonalization; inner product spaces: orthogonality; the Gram-Schmidt process; least squares; orthogonal diagonalization; singular value decomposition

Schedule[1]

Week	Topics Covered	Independent Study Expected
1	*no lessons*	
2	Introduction to systems of linear equations Gaussian Elimination Matrices and Matrix Operations Inverses; Algebraic Properties of Matrices	Read Chapter 1
3	Elementary Matrices and a Method for Finding A^{-1} More on Linear Systems and Invertible Matrices Diagonal, Triangular, and Symmetric Matrices	Read Chapters 1-2 Log into the homework website Homework 1
4	Applications of Linear Systems Determinants by Cofactor Expansion Evaluating Determinants by Row Reduction	Read Chapter 2 Use the homework website Homework 2
5	Evaluating Determinants by Row Reduction Properties of Determinants; Cramer rule	Read Chapter 3 Use the homework website Homework 3
6	Review of Chapter 3 Real vector spaces Subspaces Linear Independence	Read Chapter 4 Use the homework website Homework 4
7	Coordinates and Basis Dimension Change of Basis Row Space, Column Space, and Null Space	Read Chapter 4 Use the homework website Homework 5
8	Rank, Nullity, and the Fundamental Matrix Spaces Matrix Transformations from $\mathbb{R}^n$ to $\mathbb{R}^m$ General Linear Transformations Isomorphism Composition and Inverse Transformations	Read Chapter 4 Use the homework website Homework 6
	First Midterm Exam: (week 8)	(subject to change)
9	*no lessons*	
10	Compositions and Inverse Transformations Matrices for General Linear Transformations Similarity	Read Chapters 1-4 Use the homework website
11	Eigenvalues and Eigenvectors Diagonalization	Read Chapters 1 - 4 Use the homework website Homework 7
12	Inner Products Angle and Orthogonality in Inner Product Spaces Gram-Schmidt Process	Read Chapter 5 Use the homework website Homework 8
	Second Midterm Exam:	(to be announced)
13	Best Approximation; Least Squares Orthogonal Matrices Orthogonal Diagonalization Hermitian, Unitary, and Normal Matrices	Read Chapter 5 Use the homework website Homework 9
14	Singular Value Decomposition *general review*	Read Chapters 6 and 7 Use the homework website Homework 10

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[1]subject to change