

MA2320: Introduction to Linear Algebra

(<http://www.math.mtu.edu/kreher/ABOUTME/syllabus/MA2320.html>)

Course description

Elementary Linear Algebra An introduction to linear algebra and how it can be used. Topics include systems of equations, vectors, matrices, orthogonality, subspaces, and the eigenvalue problem. Not open to students with credit in MA2321 or MA2330.

Credits: 2.0

Lec-Rec-Lab: (0-2-0) Semesters Offered: Fall, Spring, Summer Restrictions: May not be enrolled in one of the following Major(s): Computer Science, Mathematics

Pre-Requisite(s): MA 1160 or MA 1161

Attributes: General Ed Mathematics

Text

David C. Lay *Linear Algebra and its applications*, (Fourth Edition)

Tentative Schedule.

Linear equations in Linear Algebra

	Date	Topic	Recommended exercises
M	Jun 25	1.1 Systems of Linear Equations	3,5,9,13,15,19,23,29
T	Jun 26	1.2 Row Reduction and Echelon Form	1,3,13,15,17
W	Jun 27	1.3 Vector Equations	1,5,9,11,13,17,23,25,29
R	Jun 28	1.4 The Matrix Equation $Ax = b$	3,7,9,11,15,21,25,29
M	Jul 02	1.5 Solutions Sets of Linear Equations	1,5,7,11,13,15,19,23
T	Jul 03	1.6 Applications of Linear Equations	1,5,7,11,13,15,19,23
W	Jul 04	Independence Day Recess	
R	Jul 05	No class	
M	Jul 09	1.7 Linear Independence	1,3,5,7,11,13,15
T	Jul 10	1.8 Introduction to Linear Transformations	1,3,9,15,19,21,23,33
W	Jul 11	1.9 The Matrix of a Linear Transformation	1,3,5,7,9,23,15,17,19,21 Chapter 1 Exam (Due Jul 12)

Matrix Algebra

	Date	Topic	Recommended exercises
R	Jul 12	2.1 Matrix Operations	1,3,5,7,11,15,19
M	Jul 16	2.2 The inverse of a matrix	1,3,5,9,13,15,19,23,25
T	Jul 17	2.3 Characterizations of Invertible matrices	1,3,5,13,15,19,23,25
W	Jul 18	2.8 Subspaces of R^n	1,3,5,11,15,19,23,27
R	Jul 19	2.9 Dimension and Rank	1,5,9,11,13,15,19,23

Determinants

	Date	Topic	Recommended exercises
M	Jul 23	3.1 Introduction to Determinants 3.2 Properties of Determinants	(3.1) 1,3,5,9,11,15,17,21 (3.2) 3,7,17,19,21,23,25
T	Jul 24	Review	Chapter 2 and 3 Exam (Due Jul 25)

Eigenvalues and Eigenvectors

	Date	Topic	Recommended exercises
W	Jul 25	5.1 Eigenvectors and eigenvalues	1,3,5,7,9,11,13,21
R	Jul 26	5.2 The Characteristic equation	1,3,5,9,11,15,21,23

Orthogonality and Least Squares

	Date	Topic	Recommended exercises
M	Jul 30	5.3 Diagonalization	1,3,5,7,9,21,23,27
T	Jul 32	6.1 Inner Product Length and Orthogonality	1,3,5,7,9,15,19
W	Aug 01	6.2 Orthogonal sets	1,3,7,9,17,21,23,25
R	Aug 02	6.3 orthogonal projection	1,3,5,7,11,13,15,21
M	Aug 06	6.5 Least-squares problems	1,3,5,7,11,13,15
T	Aug 07	6.6 Applications to linear models	1,3,7,9
W	Aug 08	Review	Chapter 5 and 6 Exam (Due Aug 09)
R	Aug 09	Review for Final	

Finale.

W	Aug 10	Final Exam 3:00pm to 5:00pm
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You are responsible for all of the material in these sections even if it is not presented in class.

Grading

Your grade will be based on 3 take away examinations lowest score dropped (40%) a 2 hour comprehensive final (60%).

Some advice

This course in Linear Algebra will likely be your first introduction to abstract axiomatic mathematics. This approach may seem very unfamiliar at first and your performance will depend heavily on how much effort you put into understanding the concepts. At a minimum you should

- Attend all lectures.
- Review each lecture afterwards - aiming for understanding.
- Attempt all exercises by yourself.
- Work through exercise solutions with other students in the class. Solutions are at the end of the textbook.
- Read any course related material.