UMass Boston
Department of Mathematics
Math 260 - Linear Algebra
Summer II 2014 (Jul 14 - Aug 21)

Syllabus

Course Name: Math 260 - Linear Algebra (3 credits)

Section Number: Section 01B

Description: Elementary theory of vector spaces. Topics include linear independence, bases, dimension, linear maps and matrices, determinants, orthogonality, eigenvalues and eigenvectors.

Pre-requisites: MATH 140 (or an equivalent course) OR Permission of Instructor

Schedule: MTuWTh 8:15am - 9:45am in W-02-200.
For every hour in class, you should dedicate at least three additional hours studying for this course. Students should not make any travel plans that would require them to leave before August 21, 2014.

Textbook: Lecture notes provided by the instructor.
Recommended supplemental text: Linear Algebra with Applications, 5th Edition, by Otto Bretscher. Published by Pearson, ISBN 0-321-79697-7.

Instructor: Catalin Zara, Associate Professor of Mathematics.
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Phone: 617 287-6463

Office hours: By appointment, MTuWTh 7:40am - 8:10am and 12:00pm - 12:30pm in S-03-091. Please use the online form available at `http://catazara.youcanbook.me/` to schedule a 10 or 20 minute appointment, at least 3 hours in advance. You can stop by without a confirmed appointment, but I may be unavailable.

Assignments: *Exams*: There will be two in-class exams on August 4 and August 21. Make-up exams will be allowed only with an official excuse. In all other situations, a missed exam will get a score of zero. Calculators will not be allowed on exams.

Quizzes: Almost daily there will be a brief quiz on the topics covered the previous day. There will be no make-up quizzes, but the lowest two scores will not be counted.

Homework: For each section you will have an online problem set, using WeBWorK: `https://webwork2.umb.edu/webwork2/m260-cz/`. Homework will normally be due each Monday evening, except the last assignments, which will be due Thursday evening. Late homework will be penalized.

Grading:

Exam 1: 100 points	A : 90%
Exam 2: 100 points	B : 80%
Quizzes: 100 points	C : 70%
Homework: 100 points	D : 60%

Attendance: Regular class attendance is required and active class participation is expected. Students are responsible for material and announcements missed due to an absence. Please come to class on time and turn off your cell phone before the class begins.

Student conduct: Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct as delineated in the University Catalog and Student Handbook. The Code is available online:
`http://www.umb.edu/life_on_campus/policies/code/`

Special accommodations: Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services, Campus Center, UL Room 211, (617-287-7430). The student must present these recommendations and discuss them with each professor within a reasonable period, preferably by the end of Drop/Add period.

Expectations: Students enroolled in this course are expected to be:

- Motivated and disciplined;
- Adequately familiar with background material;
- Committed and actively involved in their own learning;
- Able to work in groups;
- Secure enough to ask for help.

Goals: By fully participating in all course activities, students should be able to:

- Understand the fundamental concepts of linear algebra;
- Use linear algebra to solve problems;
- Build and improve portable skills;
- Apreciate the beauty and power of mathematics.

Additional help: Academic Support Programs offers a variety of tutoring and tutorial formats to support students in their undergraduate and graduate coursework. The Math Resource Center offers tutoring in mathematics, computer science, and information technology, either in one-on-one or in group format. More information is available at
`http://www.umb.edu/academics/vpass/academic_support/tutoring/`

Changes: Any changes or class cancellations will be announced in class or by e-mail or will be posted online. Course materials and announcements are posted on the piazza account:
`https://piazza.com/umb/summer2014/math260`

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Recommended Practice Problems

From Bretscher 5th Edition, Pearson Publishing. ISBN10: 0-321-79697-7

1.1 Introduction to Linear Systems	# 1, 7, 19, 21, 23, 25, 27, 31, 37, 42
1.2 Matrices, Vectors, and Gauss-Jordan Elimination	# 1, 7, 9, 21, 27, 29, 35, 37, 39, 47
1.3 On the Solutions of Linear Systems; Matrix Algebra	# 1, 7, 8, 13, 23, 35, 37, 52, 55, 59
2.1 Introduction to Linear Transformations and Their Inverses	# 1, 5, 7, 17, 23, 27, 33, 42, 51, 53
2.2 Linear Transformations in Geometry	# 1, 5, 7, 11, 18, 21, 26, 27, 31, 53
2.3 Matrix Products	# 3, 7, 13, 15, 23, 29, 41, 61, 63, 71
2.4 The Inverse of a Linear Transformation	# 5, 9, 19, 29, 31, 53, 79, 85, 90, 91
3.1 Image and Kernel of a Linear Transformation	# 5, 13, 15, 21, 23, 31, 33, 41, 42, 53
3.2 Subspace of $\mathbb{R}^n$; Bases and Linear Independence	# 1, 8, 17, 19, 25, 29, 33, 34, 43, 55
3.3 The Dimension of a Subspace of $\mathbb{R}^n$	# 7, 17, 23, 25, 27, 29, 32, 61, 68, 71
3.4 Coordinates	# 5, 11, 17, 21, 23, 27, 35, 39, 50, 53
4.1 Introduction to Linear Spaces	# 1, 5, 9, 10, 23, 27, 31, 33, 36, 51
4.2 Linear Transformations and Isomorphisms	# 3, 7, 15, 25, 39, 45, 53, 54, 57, 63
4.3 The Matrix of a Linear Transformation	# 1, 3, 7, 13, 21, 35, 37, 50, 55, 60
5.1 Orthogonal Projections and Orthonormal Bases	# 5, 9, 13, 15, 17, 19, 27, 35, 41, 45
5.2 Gram-Schmidt Process and QR Factorization	# 5, 11, 13, 19, 25, 27, 33, 35, 39, 45
5.3 Orthogonal Transformations and Orthogonal Matrices	# 3, 7, 8, 15, 35, 37, 40, 47, 61, 69
5.4 Least Squares and Data Fitting	# 1, 2, 5, 9, 19, 21, 25, 33, 37, 39
5.5 Inner Product Spaces	# 3, 5, 10, 11, 15, 19, 23, 27, 31, 32
6.1 Introduction to Determinants	# 3, 5, 9, 15, 17, 29, 33, 41, 49, 55
6.2 Properties of the Determinant	# 1, 5, 15, 25, 27, 32, 36, 43, 45, 50
6.3 Geometrical Interpretations of the Determinant; Cramer's Rule	# 1, 7, 11, 13, 14, 23, 25, 31, 45, 47
7.1 Diagonalization	# 1, 3, 11, 13, 17, 38, 41, 53, 61, 71
7.2 Finding the Eigenvalues of a Matrix	# 3, 5, 9, 11, 12, 27, 29, 33, 38, 45
7.3 Finding the Eigenvectors of a Matrix	# 5, 9, 11, 19, 21, 35, 37, 45, 47, 51
8.1 Symmetric Matrices	# 3, 5, 7, 11, 12, 14, 16, 17, 27, 43
8.2 Quadratic Forms	# 1, 3, 5, 7, 15, 19, 29, 33, 35, 64
8.3 Singular Values	# 1, 3, 5, 9, 10, 11, 12, 13, 17, 18