MATH 4242 (Lecture 040), Fall 2022, MWF 1:25-2:15
Burton Hall 120

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Course title and a brief description: Appplied Linear Algebra

The topics include systems of linear equations, vector spaces, subspaces, bases, linear transformations, matrices, determinants, eigenvalues, orthogonality, quadratic forms, and applications.

Prerequisites: Math 2243 or 2373 or 2573

Text and material: "Applied Linear Algebra", Second Edition,

by P. Olver and C. Shakiban, Springer, 2018.

We will cover Chapter 1, 2, 3, 4, 5, 7 and 8, omitting a few sections.

Assignments: Homework assignments are posted on the course Canvas site. Completed homework should be submitted as a PDF file through the Canvas site. Two lowest scores will be dropped at the end. No late homework will be accepted. You may discuss homework problems with other students, however, you are supposed to work out and write down the solutions yourself. Please write complete solutions clearly. Questions or objections to grading must be brought up within a week after the work is graded.

Exams and grading policy: There will be three one-hour in class exams covering appropriate parts of the material. All exams are open book and notes, but no calculators are allowed.

Exam Dates:

Friday, October 07, 2022

Monday, November 14, 2022

Wednesday, December 14, 2022

Grading scheme: homework 25%, 3 midterm exams 75% (25% each).

Make-up Exams: Make-up exams are permitted only with the most compelling reasons such as illness or university sponsored events. Written documentation and, except for medical emergencies, prior approval are required. Otherwise you will be given a 0 for the missing exam.

Statement on Incompletes, S/N:

The grade incomplete ``I" will only be assigned under extraordinary circumstances (such as hospitalization), and only if a student has satisfactorily (a C- grade or better) completed all but a small portion of the work for the course, and has made prior arrangements to complete the work.

To obtain an S, you need at least a C- grade.

Scholastic Conduct: Each student should read his/her college bulletin for the definitions and possible penalties for cheating. During the exams you must do your own work. Students suspected of cheating will be reported to the Scholastic Conduct Committee for appropriate action. Academic dishonesty in any

portion of the course shall be grounds for assigning a grade of F or N for the entire course.

Math 4242 reading schedule (subject to change)

09/07 Gauss elimination, pivoting 1.1-1.4

09/14 Inverses, linear systems, determinants 1.5,1.6,1.8,1.9

09/21 Vector spaces, span, bases, dimension 2.1-2.3

09/28 Kernel, range, adjoints, solvability 2.4-2.5

10/05 Inner products, norms 3.1-3.3

10/07 Midterm I (covering Chapter 1 and 2)

10/14 Positive definite, Cholesky 3.4-3.6

10/21 Orthogonal bases and matrices, Gram-Schmidt 4.1-4.2

10/28 Orthogonal matrices and projections 4.3-4.4

11/04 Minimization, least squares, interpolation 5.1-5.5

11/11 Linear transformations 7.1-7.2

11/14 Midterm II (covering Chapter 3, 4 and 5)

11/21 Isometries, linear systems 7.3-7.5

11/30 Eigenvalues, diagonalization 8.2-8.4

12/07 Symmetric matrices, Jordan canonical form 8.5-8.6

12/14 Midterm III (covering Chapter 7 and 8)