

MATH 499-01 – Topics in Linear Algebra
Spring 2024 Syllabus

Instructor: Grant Kopitzke
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Classroom: Wausau 089 or room 191 (depending on room availability)
Class Meeting Time: 9:00AM – 10:15AM, Tuesday and Thursday

Office Hours: 12:00-1:00 MTWR

Textbook: *Introduction to Linear Algebra, fifth edition*, by Gilbert Strang. ISBN: 978-0-9802327-7-6

Course Content: We will attempt to get through chapters 1 through 8 in the textbook. Topics of focus will include solving systems of linear equations, solving equations of the form $Ax = b$, solving equations of the form $Ax = \lambda b$, finding approximate solutions to $Ax = b$, eigenvalues and eigenvectors, vector spaces, subspaces derived from linear transformations, least squares problems, and the singular value decomposition.

Course Structure: Each week you will be assigned online lecture videos to watch, sections from the textbook to read, and homework problems to complete. We will meet each week on Tuesdays and Thursdays for 75 minutes to discuss the content from the previous days' videos and homework, and to work through homework problems. Meeting content/format will vary based on student needs but will generally take the form of "recitation sessions". We will discuss any questions you may have on the lectures, textbook material, or homework, and will work through additional example problems. You may also have to present some problems to the class (TBD). You can choose whether you want to just read the textbook, or watch the lecture videos, or both. I recommend watching the lecture videos and (at minimum) scanning through the textbook to make sure you understand everything in that section.

Attendance: You will be expected to attend our weekly meetings in person for approximately the first month of class. After that we may switch to an online format for approximately the second month of class, during which time you'll be expected to log into Zoom or Teams (links will be provided) and attend class via that modality. We'll decide as a group if we want to keep the online modality or switch back to in-person to finish out the semester. Attendance won't directly affect your grade, but participation during our meetings will.

Assignments: You will have weekly or biweekly homework assignments that will be turned in on Canvas that will count toward your grade in the course. We may also have one or two take-home exams with longer or harder problems. If you all seem to be attaining a sufficient mastery of the material via your at-home study (i.e., if discussions in class meetings are minimal) then I will also assign problems for you to present to the class during our meetings. Each of these items will contribute to your grade.

Grades: Your grade will be determined by your participation during our meetings, your performance on homework/exams, and by my judgement of your mastery of the material.

If we have exams:

Homework=40%

Exams=40%

Participation/Presentations=20%

If we don't have exams:

Homework= 70%

Participation/Presentations=30%

Grading Scale: Final grades will be assigned according to the standard 4-point scale.

Homework assignments will be graded on a scale of 0-3 according to the following rubric. To convert to final grades, homework grades will be converted to a 4-point scale by linear interpolation.

0 = No submission/No effort put in. (You can think of this grade as being an F)

1 = Shows a serious lack of understanding – come talk to me to review these things. (You can think of this grade as being a D)

2 = Progressing. Your work is mostly good, and shows that you understand most of the key ideas, but may have made some errors or had minor misunderstandings. (You can think of this grade as being a B or C)

3 = Good. Your work is mostly flawless, and demonstrates a complete understanding of the material (except possibly for a few small computational errors or typos). You can think of this grade as being an (A or B+)

Exams will be graded the usual way (i.e., how they were graded in Calc 2 and 3, minus the extra credit opportunities).

In-class presentations and participation will be graded subjectively by myself based on the quantity and quality of your contributions, and will be graded according to the standard 4-point scale.

Tentative Schedule:

Week 1 (Jan. 22-26): Sections 1.1, 1.2, 1.3 2.1, 2.3

Week 2 (Jan. 29 – Feb. 2): Sections 2.4, 2.5, 2.6

Week 3 (Feb. 5 – Feb. 9): Sections 2.7, 3.1, 3.2

Week 4 (Feb. 12 – Feb 16): Sections 3.3, 3.4, 3.5

Week 5 (Feb. 19 – Feb. 23): Sections 3.3, 3.6, 10.1

Week 6 (Feb. 26 – Mar. 1): Sections 4.1, 4.2, 4.3

Week 7 (Mar. 4 – Mar. 8): Sections 4.4, 5.1, 5.2

Week 8 (Mar. 11 – Mar. 15): Sections 5.3, 6.1, 6.2

Week 9 (Mar. 18 – Mar. 22): Spring Break (No class)

Week 10 (Mar. 25 – Mar. 29): Sections 6.2, 6.3, 10.3, 10.5

Week 11 (Apr. 1 – Apr. 5): Sections 6.4, 6.5, 9.2, 9.3

Week 12 (Apr. 8 – Apr. 12): Sections 6.5, 6.2

Week 13 (Apr. 15 – Apr. 19): Sections 7.1, 7.2

Week 14 (Apr. 22 – Apr. 26): Sections 8.1, 8.2, 8.3

Week 15 (Apr. 29 – May 3): TBD

Week 16 (May 6 – May 10): TBD

Week 17 (May 13 – May 16): Final Exams (No class)