

Class schedule: Math 3110, Spring 2014

As explained on the first day of class, this section of Math 3110 will be a “half-flipped” course. Students will be required to watch roughly one video lecture a week on their own time. To make up for this, roughly one in-class period a week (usually Tuesday) will be allocated as an interactive problem solving session, with a special focus on homework problems. Homework will (usually) be due Fridays by 2pm.

This document contains the schedule of what we did in each class, as well as what you need to do each weekend. By “weekend,” I mean the 5-day period between the end of class Thursday and the beginning of class the following Tuesday morning.

Thu 1/9. Course overview. In-class lecture covering *Lecture 1: The Geometry of Linear Equations* (0:00–15:25).

Weekend. Watch *Lecture 1: The Geometry of Linear Equations* (15:26–39:49). Start working on HW 1; come to class with questions. Optional: Watch the video lecture “*Overview of the key ideas of linear algebra*,” posted on the course webpage.

Tue 1/14. Quiz 1. HW 1 questions and discussion. In-class lecture covering *Lecture 2: Elimination with matrices*: (0:00–19:05).

Thu 1/16. HW 1 questions and discussion (40 minutes). In-class lecture covering *Lecture 2: Elimination with matrices* (19:05–47:42), and *Lecture 3: Multiplication and inverse matrices* (0:00–11:40).

Weekend. Watch *Lecture 3: Multiplication and inverse matrices* (11:40–46:49), and *Lecture 4: Factorization into $A=LU$* (0:00–50:13). Start working on HW 2; come to class with questions.

Tue 1/21. Quiz 2. Worked on HW 2 in class.

Thu 1/23. In-class lecture covering *Lecture 5: Transposes, Permutations, Vector spaces* (20:17–47:42) and *Lecture 6: Column Space and Nullspace* (0:00–46:01).

Weekend. Watch *Lecture 5: Transposes, Permutations, Vector Spaces* (0:00–20:17), and *Lecture 7: Solving $Ax=0$: Pivot Variables, Special Solutions* (0:00–43:20). Start working on HW 3; come to class with questions.

Tue 1/28. Quiz 3. Worked on HW 3 in class.

Thu 1/30. HW 3 questions and discussion. In-class lecture covering *Lecture 8: Solving $Ax = b$: Row Reduced form R* (0:00–24:29).

Weekend. Watch *Lecture 8: Solving $Ax = b$: Row Reduced form R* (24:29–47:20), and *Lecture 9: Independence, Basis and Dimension* (0:00–50:14). Start working on HW 4; come to class with questions.

Tue 2/4. Quiz 4. Worked on HW 4 in class.

Thu 2/6. HW 4 questions. In-class lecture covering *Lecture 10: The Four Fundamental Subspaces* (4:20–49:20).

Weekend. Watch *Lecture 10: The Four Fundamental Subspaces* (0:00–4:19); he fixes a typo from Lecture 9. Also watch *Lecture 11: Matrix Spaces; Rank 1; Small World Graphs* (0:00–45:56). Start working on HW 5; come to class with questions.

Tue 2/11. Quiz 5. Worked on HW 5 in class.

Thu 2/13. Class canceled (snow). Watch *Lecture 12: Graphs, Networks, Incidence Matrices* (0:00–47:57). You may turn in HW 5 on Monday.

Weekend. Watch *Lecture 13: Exam 1 Review* (0:00–47:40). Start working on HW 6; come to class with questions.

Tue 2/18. In-class lecture covering *Lecture 14: Orthogonality* (0:00–34:11).

Thu 2/20. Quiz 6. Worked on HW 6 in class.

Weekend. Study for midterm, which covers all of “Unit I” excluding the electrical networks. In other words, everything through HW 6.

Tue 2/25. Midterm 1.

Thu 2/27. In-class lecture covering *Lecture 14: Orthogonality* (34:12–49:48), *Lecture 15: Projections Onto Subspaces* (0:00–39:40), and *Lecture 16: Projection Matrices and Least Squares* (36:51–48:04).

Weekend. Watch *Lecture 15: Projections onto Subspaces* (39:41–48:51) and *Lecture 16: Projection Matrices and Least Squares* (0:00–36:50). Start working on HW 8; come to class with questions.

Tue 3/4. Quiz 7. Worked on HW 8 in class.

Thu 3/6. In-class lecture covering *Lecture 17: Orthogonal Matrices and Gram-Schmidt* (0:00–49:25).

Weekend. Watch *Lecture 18: Properties of Determinants* (0:00–49:12). Start working on HW 9; come to class with questions.

Tue 3/11. Quiz 8. Worked on HW 9 in class.

Thu 3/13. Quiz 9. In-class lecture covering *Lecture 19: Determinant Formulas and Cofactors* (0:00–43:44), and *Lecture 20: Applications of Determinants* (28:08–51:01).

Weekend. SPRING BREAK

Tue 3/18. SPRING BREAK

Thu 3/20. SPRING BREAK

Weekend. Watch *Lecture 19: Determinant Formulas and Cofactors* (43:45–53:17), and *Lecture 20: Applications of Determinants* (0:00–28:07). Start working on HW 10; come to class with questions.

Tue 3/25. Class canceled. Please watch *Lecture 21: Eigenvalues and Eigenvectors* (0:00–51:23) on your own time before Thursday.

Thu 3/27. Quiz 10. HW questions. In-class lecture covering *Lecture 22: Diagonalization and Powers of A* (0:00–26:39).

Weekend. Study for Midterm 2, which will cover everything through determinants. In other words, though HW 10.

Tue 4/1. Midterm 2.

Thu 4/3. In-class lecture covering *Lecture 22: Diagonalization and Powers of A* (26:39–51:50).

Weekend. Skip Lecture 23. Watch *Lecture 24: Markov Matrices; Fourier Series* (0:00–51:12). Start working on HW 12; come to class with questions.

Tue 4/8. Quiz 11. Worked on HW 12 in class.

Thu 4/10. In-class lecture covering *Lecture 25: Symmetric Matrices and Positive Definiteness (0:00–35:00)* and *Lecture 26: Complex Matrices; Fast Fourier Transform (FFT) (0:00–16:26)*.

Weekend. Watch *Lecture 25: Symmetric Matrices and Positive Definiteness (35:01–43:51)*. Skip Lecture 26. Watch *Lecture 27: Positive Definite Matrices and Minima (0:00–51:12)*. Start working on HW 13; come to class with questions.

Tue 4/15. Worked on HW 13 in class.

Thu 4/17. Quiz 12. In-class lecture covering *Lecture 28: Similar Matrices and Jordan Form (0:00–45:56)*.

Weekend. Watch *Lecture 29: Singular Value Decomposition (0:00–41:35)*. Start working on HW 14; come to class with questions.