

Class schedule: Math 2080, Fall 2015

Week 1: 8/19–8/21. Course overview. Two in-class lectures covering all of *Section 1: Introduction to Differential equations*. (YouTube Lectures 1.1–1.3.)

Week 2: 8/24–8/28. Three in-class lectures covering *Section 2: First Order Differential Equations*, p.1-12: YouTube Lectures 2.1–2.4, Lecture 2.5 (0:00–7:46).

Thursday: Watch *Lecture 2.5: Linear Differential Equations* (7:47–44:46). Notes: Section 2, p.12-14.

Friday: Quiz 1. Work on HW 2, HW 3, and Worksheets in class.

Week 3: 8/31–9/4. Three in-class lectures covering *Section 2: First Order Differential Equations*, p.14-21, and *Section 3: Second Order Differential Equations*, p.1-3,6. YouTube Lectures 2.6–2.8, 3.1, Lecture 3.2 (0:00–13:58, and 45:34–1:00:42).

Thursday: Watch *Lecture 3.2: 2nd Order ODEs with Constant Coefficients* (13:59–45:33), and *Lecture 3.3: The Method of Undetermined Coefficients* (0:00–10:58). Notes: Section 3, p.4,5,7.

Friday: Quiz 2. Work on HW 3, HW 4, and Worksheets in class.

Week 4: 9/7–9/11. Three in-class lectures covering *Section 3: Second Order Differential Equations*, p.7–18. YouTube Lectures 3.3 (10:59–54:38), Lectures 3.4–3.5.

Thursday: Watch *Lecture 3.6: Variation of Parameters* (0:00–41:41). Notes: None.

Friday: Quiz 3. Work on HW 6, HW 7, and Worksheets in class.

Week 5: 9/14–9/18. Three in-class lectures covering *Section 3: Second Order Differential Equations*, p.18–25. YouTube Lectures 3.7–3.8, Lecture 3.9 (0:00–19:40).

Thursday: Watch *Lecture 3.9: The Method of Frobenius* (19:41–44:51). Notes: Section 3, p.25–29.

Friday: Quiz 4. Work on HW 8, HW 9, and Worksheets in class.

Week 6: 9/21–9/25. Three in-class lectures covering *Section 4: Systems of Differential Equations*, p.1–10. YouTube Lectures 4.1–4.2.

Thursday: Watch *Lecture 4.3: Mixing with Two Tanks* (0:00–29:55). Notes: Section 4, p.10–13.

Friday: Quiz 5. Work on HW 9, HW 10, and Worksheets in class.

Week 7: 9/28–10/2. Two in-class lectures covering *Section 4: Systems of Differential Equations*, p.13–18. YouTube Lectures 4.4–4.5, and Lecture 4.6 (0:00–17:09).

Tuesday: Midterm 1, covering Sections 1–3.

Thursday: Watch *Lecture 4.6: Phase Portraits with Complex Eigenvalues* (17:10–47:10). Notes: Section 4, p.19–21.

Friday: Quiz 6. Work on HW 11, HW 12, and Worksheets in class.

Week 8: 10/5–10/9. Three in-class lectures covering *Section 4: Systems of Differential Equations*, p.21–25 and supplemental material. YouTube Lecture 4.7, Lecture 4.8 (0:00–39:51), and Lecture 4.9 (to be posted soon).

Friday: No class. Please watch *Lecture 4.8: Stability of phase portraits* (39:52–51:01), and *Lecture 5.1: What is a Laplace transform?* (0:00–28:10).

Week 9: 10/12–10/16. No class Monday or Tuesday (Fall break). Quiz 7 on Wednesday, and half-class spent answering homework questions. 1.5 in-class lectures covering *Section 5: Laplace transforms*, p.4–7. YouTube Lecture 5.2 (0:00–46:47).

Week 10: 10/19–10/23. Three in-class lectures covering *Section 5: Laplace transforms*, p.9–16 and supplemental material. YouTube Lectures 5.2 (46:48–57:52), and Lectures 5.3 and 5.4.

Thursday: Watch *Lecture 5.5: Impulse functions* (0:00–24:36). Notes: Section 5, p.16–17.

Friday: Quiz 8. Work on HW 15, HW 16, and Worksheets in class.

Week 11: 10/26–10/30. Three in-class lectures covering *Section 5: Laplace transforms*, p.18–21, and *Section 6: Fourier series*, p.1–7. YouTube Lectures 5.6, 6.1, 6.2, and Lecture 6.3 (0:00–9:54).

Thursday: Watch *Lecture 6.3: Fourier sine & cosine series* (9:66–47:49). Notes: Section 6, p.8–10.

Friday: Quiz 9. Work on HW 17, HW 18, and Worksheets in class.

Week 12: 11/2–11/6. Three in-class lectures covering *Section 6: Fourier series*, p.11–13 and supplemental material. YouTube Lectures 6.4, Lecture 6.5 (14:42–24:45), and Lecture 6.6 (0:00–30:10).

Thursday: Watch *Lecture 6.5: Applications of Fourier series sine & cosine series* (0:00–14:41), and *Lecture 6.6: Boundary value problems* (30:11–39:55). Notes: Section 6, p.13 and supplemental material.

Friday: Quiz 10. Work on HW 18, HW 19, and Worksheets in class.

Week 13: 11/9–11/13. Two in-class lectures covering *Section 7: Partial differential equations*, p.1–5 and supplemental material on Fourier transforms. YouTube Lecture 7.1 and Lecture 7.2 (0:00–9:12).

Tuesday: Midterm 2, covering Sections 4.1–6.4.

Thursday: Watch *Lecture 7.2: Different boundary conditions* (9:13–36:23). Notes: Section 7, p.5–7.

Friday: Quiz 11. Work on HW 19, HW 20 and Worksheets in class.

Week 14: 11/16–11/20. Midterm 2 returned and reviewed (0.5 lecture). 2.5 in-class lectures covering *Section 7: Partial differential equations*, p.8–15 and supplemental material. YouTube Lectures 7.3–7.5.

Thursday: Watch *Lecture 7.6: Laplace's equation* (0:00–36:27). Notes: Section 7, p.15–17.

Friday: Quiz 12. Work on HW 20, HW 21 and Worksheets in class.

Week 15: 11/23–11/27. 1.5 in-class lectures covering *Section 7: Partial differential equations*, p.17–23. YouTube Lectures 7.7, 7.8. Half class going over HW 21. No class Wed–Fri (Thanksgiving break).

Week 16: 11/30–12/4. (Tentative). Two lectures on supplemental material (likely non-linear systems), course and final exam review, and discussion about summer research program and internship opportunities.