18.721 SUBJECT OUTLINE

This is a tentative schedule that will be modified during the semester.

I. Plane Curves
1. Wed, February 7: plane curves
2. Fri, February 9: tangent lines
3. Mon, February 12: dual curve
4. Wed, February 14: resultants
5. Fri, February 16: genus

Mon, February 19: President’s Day

6. Tues, February 20: Plücker Formulas

II. Affine Algebraic Geometry
7. Wed, February 21: Zariski topology
8. Fri, February 23: morphisms
9. Mon, February 26: finite group actions

III. Projective Algebraic Geometry
10. Wed, February 28: projective varieties
11. Fri, March 2: homogeneous ideals
12. Mon, March 5: lines in $\mathbb{P}^3$
13. Wed, March 7: morphisms

IV. Dimension
14. Fri, March 9: dimension
15. Mon, March 12: Nakayama Lemma
16. Wed, March 14: integral morphisms
17. Fri, March 16: Chevalley’s finiteness theorem
18. Mon, March 19: double planes

19. Wed, March 21: First Quiz
V. Constructible Sets

20. Fri, March 23: *valuations and smooth curves*

Mon-Fri, March 26-30: **Spring Break**

21. Mon, April 2: *constructible sets*
22. Wed, April 4: *closed sets, proper morphisms*
23. Fri, April 6: *open*

VI. $\mathcal{O}$-Modules

24. Mon, April 9: *$\mathcal{O}$-modules*
25. Wed, April 11: *defining an $\mathcal{O}$-module*
26. Fri, April 13: *direct image*

Mon, April 16: **Patriot’s Day**

27. Wed, April 18: *twisting*

VII. Riemann-Roch for Curves

28. Fri, April 20: *branched coverings, cohomology*
29. Mon, April 23: *Riemann-Roch, version 1*
30. Wed, April 25: *Birkhoff-Grothendieck Theorem*
31. Fri, April 27: *differentials*
32. Mon, April 30: *Riemann-Roch, version 2*

VIII. Cohomology

33. Wed, May 2: *complexes*
34. Fri, May 4: *characteristic properties*
35. Mon, May 7: *cohomology of the twisting modules*
36. Wed, May 9: *finiteness of cohomology*

37. Fri, May 11: **Second Quiz**

38. Mon, May 14: *applications*
39. Fri, May 16: *open*