Below is a list of topics that I am consulting as I write the final exam. The first 20 topics are those you have already seen in the study guide for the midterm. The others are from the material not covered on the midterm. The final is likely to have somewhere between 36 and 40 multiple-choice questions, and between 8 and 10 short-answer questions. Consequently, it is likely that not every topic on this list will be included on the exam. It is also probably the case that I have neglected to include some topics that we clearly covered during the course, and I reserve the right to include such topics on the exam. With that said, this is a pretty good guide on what to study. Notice that this particular document is Version 1.0. I may produce an updated study guide at some point during the next few days.

1. A lever question.
2. An Ohm’s law question.
3. A power (as in $P = IV$) question.
4. A power (as in $P = I^2R$) question.
5. A $v = v_0 + at$ question.
6. An $x = x_0 + v_0t + (1/2)at^2$ question.
7. A constant velocity $F=ma$ problem.
10. A work problem.
17. Electrostatics.
19. Mechanical advantage.
20. Magnetic fields and their interactions with charges.

21. n-type and p-type semiconductors.
22. p-n junctions
23. Depletion region
24. Diodes
25. Capacitors
26. Power adaptors
27. n-channel and p-channel mosfet transitors.
28. Binary representation of numbers
29. Digital representation of sound
30. Logic circuits
31. Electromagnetic waves
32. \( c = f \cdot \lambda \).
33. Index of refraction \( n: \ c_{\text{medium}} = c/n_{\text{medium}} \).
34. Sunlight and the difference between the blackbody spectrum and the spectrum associated with discharge lamps.
35. Refraction.
36. Rainbows
37. Interference
38. Isotopes.
39. Alpha decay
40. Beta decay
41. Gamma emission.
42. Fission.
43. Fusion
44. Fission weapons and critical mass.
45. The difference between fission weapons based on uranium and plutonium.
46. The concept behind a “hydrogen bomb”.
47. How plutonium is produced.
49. The effects of nuclear explosions.
50. Very basic idea of how a nuclear reactor works (at the level of the slide in lecture 35).
51. Available energy resources with and without breeding plutonium using U-238.
52. How it is that X-rays make it possible to make useful images of our bodies, i.e. that certain elements absorb X-rays more readily than others.
53. What a CT scan is.
54. Very basic idea of how magnetic resonance imaging (MRI) works.
55. The relative strengths and weakness of CT scans and MRI.

To best determine what you should know about each topic look at what is said in your text, look at the lecture slides, and look at questions from past homework, the midterm, and the quiz. Among the questions you can expect to see will be some that are close to those that you have seen previously!