General

1. The exam will cover all material through and including problem set four. Relativity and Photons (photoelectric effect, x-rays, compton).
2. You may bring a half page full of formulas (front and back).
3. There is a formula sheet on the web site. But you may NOT use this on the exam.
4. There are two previous years exam on the web site together with solutions. Practice Exam 1 was too long
5. The practice exams are a very good way to study and will have a large overlap with the exam. But, they are not comprehensive. i.e. there is more stuff that we covered which could appear on the exam that is not on the practice exam. The homework is comprehensive.

Subject and Problems:

PT = Practice Test, HW= homework

1. Understand spacetime diagrams in classical relativity and special relativity. HW1.1, PT1.2, PT2.1, HW2.5.4, HW2.5.6
2. Lorentz Transformations, PS2. Practice Test. PT1.2, PT2.1, HW2.2, HW2.3, HW2.5
3. Work simple problems involving length contraction and time dilation. Often combined with taylor series PT1.2, PT2.1, HW1.2,HW1.3, HW1.6, HW3.6
4. Addition of Velocities: PT2.1, PT1.2, HW2.4, HW2.7
5. Doppler Shift: HW1.5
6. Understand simple taylor series: HW1.2, HW1.3, PT1.3.5, PT2.3.3, HW1.6
7. Relativistic momentum, energy, kinetic energy. HW3.7.10, HW3.1, HW3.2, HW3.3, HW3.4, HW3.5, PT1.1, PT2.2
8. Binding Energy: HW3.7, Lecture 5-Examples-Pages 10–13
9. Relativistic collisions and decays of particles. see HW3-almost all. PT1.1, PT2.2, HW4.E2.15, HW4.E2.16. PT2.3.
10. Lorentz transformation of momenta. HW3.2.
11. Quantum nature of Light: PT1.3, HW4.2.10, HW4.2.11, HW2.13
12. Photo-Electric Effect. Practice Test. PT1.3, HW4.2.1, HW4.2.2
13. X-ray production. HW4.2.24
14. Compton Effect: HW4.2.15, HW4.2.16, HW4.2.19, PT2.3
15. Scales: PT1.1,PT2.2 Formula sheet+remember a few numbers