8.01 ESG Independent Study Fall 2005

Unit 1: Particles and Vectors
Unit 2: Motion Along a Straight Line
Unit 3: Motion in a Plane
Unit 4: Newton’s Laws
Unit 5: Dynamics
Unit 6: Review (Units 1–5)
Unit 7: Work and Energy
Unit 8: Conservation of Energy
Unit 9: Conservation of Linear Momentum
Unit 10: Collisions
Unit 11: Review (Units 1–10)
Unit 12: Rotational Motion & Angular Momentum
Unit 13: Conservation of Angular Momentum
Unit 14: Harmonic Motion
Unit 15: Gravitation and Central Forces
Unit 16: Review (Units 1–15)

Books: While you are free to use any books you like, with these study guides we recommend:

1. Halliday & Resnick, Physics, Part 1, third edition. The questions at the end of the chapters are particularly worthwhile. (The new fourth edition may of course be used, but the material in the C&MS study guides refer to the third edition.)

2. French & Hudson, Physics—A New Introductory Course (PANIC), Parts I & II.¹

3. Problem Booklet to PANIC.²

4. Gray, Williams & Brownstein, Student Study Guide With Programmed Problems. Hereafter referred to as H&R SSGWPP. If you are having difficulty with any of the material this is a good place to look for help. It was written to accompany H&R.

¹These are available in the ESG library.
²This is sometimes available in the ESG library. It wanders.


**Mathematics:** This is a physics course, not a math course. However, we will use mathematics freely where appropriate. If at any point your mathematics background is insufficient to deal with the material, please speak with one of the tutors. C&MS units are available for Calculus. Other self-help material in mathematics is contemplated, but not currently in place. Occasionally suggestions for more work in mathematics are given in the study guides. Another source of help is a math instructor.

**Review Units:** The unit tests for review units differ from regular unit tests in certain respects. Regular unit tests are designed to test everything in a given unit. Review unit tests draw upon much if not all of the material in preceding units. Both types of tests should not require more than 20 or 30 minutes; both may be repeated when necessary.