

## 1. INTRODUCTION TO PHYS 135:

This semester's material is in two parts plus a little more:

- (1) Special Relativity
- (2) Quantum Theory
- (3) Reflections on the combination

We'll set off on an exploration of these two foundational building blocks of the modern physical understanding of the world. Luckily for us the subjects are conceptually rich and need not be formulated with complex mathematical machinery. Whenever possible I will avoid a mathematical treatment. Nevertheless we will use diagrams, simple numerical calculations and algebra during the course. A quick look at the first half of the text *Flat and Curved Space-times* will give you an idea of the math that we will be using. I will not assume that you have had any instruction in physics.

There is no set material that we "have to get through" so I hope that your interests will help determine the path through the semester.

## 2. COURSE INFORMATION

**Instructor:** Seth Major (feel free to call me "Seth")

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**Office Hours:** Wednesday 2:30 - 5 PM in the tutorial area outside my office (drop-in help sessions). Feel free to call or send an email about a homework problem, questions on the text, or any other issue you'd like to chat about.

**Texts:** Shop around for the best prices on these books; I was surprised by the bookstore price of \$95 for *Flat and Curved*.

- Ellis and Williams, *Flat and Curved Space-times*, 2nd edition.
- Styer, *The Strange World of Quantum Mechanics*

**On learning physics:** Learning occurs, and the seed of understanding is planted, when we think about a subject. This thinking happens when we actively confront a situation or a problem in a new way. Unfortunately, full understanding normally occurs only after iterating this process several times! Such active engagement with the material is especially beneficial to learning physics. As much as is possible, this course is structured to foster this active learning - hopefully giving you a chance to understand some of the complexity, beauty, and fun of working in physics.

The work for the course will consist of reading, attending classes, solving some problems or puzzles

*Weekly Guides:* Every week I will distribute a weekly Guide which includes information on problems, reading, and other aspects of the course. I strongly recommend that you read over the material before class.

Guides normally will be posted on the 195 site Wednesday morning. When you have solutions due, the deadline will be Wednesday before 5 PM. They will be graded out of 20 points. Solutions will be generally be available on Friday through electronic means (if all goes well).

During class I will demonstrate the different types of solutions before they are due so you know what to expect. When preparing your solutions keep the reader - a fellow student - in mind. Write up your work in a logical, easy-to-read manner. A common best practice is to copy over your solutions and hand in a readable final copy.

Please do consult with students and professors when you are solving these problems, but write up your own solutions. If you have difficulty please stop by to ask questions.

I expect that we will have about 7 of these sort of assignments.

*Exams:* We'll have an in-class mid-term relatively early in the semester and a final. The final will be during the scheduled time: Wednesday, December 17 at 9 AM. The exams include material in reading and lecture.

When writing up your work please be always aware of the Hamilton Honor Code.

*Grades:* Your semester grade will be determined by the following scheme:

Solutions	50%
Participation	10%
Exams	40%

Enjoy!