Our Modified 303L curriculum (based on M&I textbook)

Homepages:

chiu: http://www.ph.utexas.edu/~itiq/303Lsp13/chiu/
Li: (tba)
Tuner (2 sections): (tba)

Lesson plan.

We are using the textbook M&I vol II, 3d edition by Chabay and Sherwood. Our lesson plan link is at the top line of the homepage. A comparison between our plan and the table of content of the textbook suggests that the goal of this course is to cover most important physics in the textbook.

This course is divided into 4 units. Each unit ends with review sessions and a midterm.

- Clicker questions: There is a "default"set of clicker questions associated with each lecture. These questions are intended to indicate selected highlights of each lecture. Selection of the appropriate set of clicker questions is an important part in our curriculum development. The present default set are expected to be modified and improved upon from semester to semester.
    - Caution: The lecture number label of the slides is based on Spring 12 lesson plan. For current semester there could be some mismatch.
    - Optional references: For additional clicker questions, see the third bullet under the same lecture related links.
- HW assignment and extra examples: There are hw-problems to go along with each non-review lecture. We also post extra examples along with the hw-set in quest. The extra examples are intended to provide students with further application problems.
- Course summary: For each unit there is a course summary page (posted under the header of related link/) which defines the physics content of the unit students are responsible for. Students are encouraged to refer to the summary page frequently while studying the course materials and doing their homework. For unit one, the summary of unit 1 will be distributed during the exam. From unit2 on, the same page together with the page(s) of earlier unit(s) will be distributed during the exam.

Midterm is designed to test student's understanding of the unit materials. A student who understands the textbook materials, the course summary, the hw problems, the extra-examples, and the clicker questions are expected to do well in the exam.

Our TA sessions are designed to reinforce the learning of the same physics content of the unit materials as defined by the course summary if the 4 pages. We will refer to the organization of TA sessions in a separate discussion.

Modifications on the original M&I curriculum.

While we use the M&I textbook as the basis of this course, we have made several modifications. We are still at the developing stage. To the teaching team of this course, consider yourself as a team member in further developing the curriculum. Your ongoing suggestions and discussions are very welcome. Below are up-to-date modifications members of the teaching team and students should be aware of.

1. We require students to learn beyond the math skills covered in the MI-text book. Here are two examples

- The small argument expansion, (see clicker question: Lec3-3). For example in unit 1, you will find this expansion is useful in understanding interactions which involve dipoles.
- This course is calculus based. Students need to learn the basic technique of differentiation and integration. Throughout this semester we discuss relevant techniques needed, which enable students to follow essentially all the integration results presented in the textbook.

2. In the text book Gauss law and Ampere's law are introduced in unit 3. In our lesson plan, we consider them in earlier units. More specifically, in unit 1, when we consider the field associated with a spherically symmetric charge distribution, we find it is appropriate to expose students to a simplified version of the Gauss law, which is specific for the symmetric charge distributions. We leave the general discussion on the Gauss law to unit 3. Similarly we find it is more convenient for us to introduce a simplified version of the Ampere's law, specific for the symmetric current configuration in unit 2. Again we leave more general discussions on the Ampere's law to unit 3.

3. In our lesson plan we have reduced the discussion of chapter 19 to one lecture.

4. On the discussion of Faraday's law, we follow the traditional approach to include the discussion of Lenz's rule as a part of Faraday's law rather than, as done in the textbook, leave the Lenz law to the very last section of the chapter.

5. In the derivation of the radiation field due to acceleration of point charge, instead of treating it as an optional topic as given in the text, we consider it as an important achievement of the classical electrodynamics, and include it as the main topic in a lecture 36. (See clicker questions: Lec36-1, 2, 3, 4)

6. On the geometric optics, the textbook motivates the thin lens formula using the results of a computer simulation, that the angle of deviation is independent of the incident angle theta, provided theta is small. We present an analytic proof to justify the theta-independent results. (See clicker question: Lec38-4)