PHYS T580, Spring 2018

The Standard Model

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Lectures: MWF 9:00-10:00, Disque 919
Office Hours: M 12-1, Th 2-3, or by appointment in advance.
Webpage: http://mimas.physics.drexel.edu/StandardModel

Textbooks

This is a fairly unusual course. In many ways, it’s the first of its type, and you are the very first class to use my new textbook:


Course Overview

Much of the work you’ve done in your previous physics courses have been based on the assumption that there is a more fundamental theory which ties everything together. The Standard Model is the best thing we have to describing all that there is in Nature.
In this class, we will focus on Classical Fields in general. We will discuss briefly how classical fields relate to quantum fields, but for the most part, the ugliness of Quantum Field Theory will be an abstraction.
We will have a brief introduction to group theory, and then focus for the remainder of the term on U(1), SU(2), and SU(3), the theories underlying electromagnetism, the weak, and strong forces, respectively.
We will talk about electroweak unification in particular, and unified theories in general. We will conclude with a discussion of Grand Unified Theories.
I will assign reading roughly weekly, and I’d like you to do the readings before we discuss them in class.
The structure of this class will be semi-flipped. That is, we’ll have a more active interaction with the material if you’ve been exposed to it before I start talking about it at the board.

A note for auditing students

I welcome students to sit in on this course. However, by doing so, you are committing to put in the work necessary to meaningfully participate. This means:

1. You are to attend every class and show up on time.
2. While you are not to submit homeworks to take exams, you are expected to do them. I will ask to see that you’ve made the attempt and you may grade yourselves after I’ve passed back solution keys.
3. You are expected to be as engaged and interactive as students taking the class for credit.

Any auditing students not complying with this policy will be asked to leave.
Evaluation
The grading scheme for this course is:

- 25% Homework
- 10% Class Participation
- 30% Midterm
- 35% Final Exam

Homework
I will give you a short homework every week (ideally on Mondays, but interruptions will occur). Problems will be selected from the book (but as I've written the book, it's a little different than normal book problems as this will also give you a sense of the sort of problem that I'm likely to give on exams). A lateness penalty of 5% will be assessed for each day late, and no homeworks will be accepted after solution keys have been passed back.

You are expected and encouraged to discuss homework in a general way. However, you are to prepare your written assignment on your own. Copying or collaboration on the final submission will result in zeros for all concerned.

Academic Policies
Unless otherwise stated, the work on all homeworks and your exams is to be your own. While discussion with your classmates is encouraged, you are to actually do the work on your own.

In addition, please refer to university academic dishonesty policies:
http://www.drexel.edu/provost/academic_dishonesty.asp
http://www.drexel.edu/studentlife/judicial/honesty.html

And the registration policies:
http://www.drexel.edu/ods/student_reg.html
http://www.drexel.edu/provost/policies/course_drop.asp

Drexel Learning Priorities

- Information Literacy - Possess the skills and knowledge to access, evaluate and use information effectively, competently and creatively.
- Technology Use - Make appropriate use of technologies to communicate, collaborate, solve problems, make decisions, and conduct research, as well as foster creativity and life-long learning.
- Professional Practice - Apply knowledge and skills gained from a program of study to the achievement of goals in a work, clinical, or other professional setting.
- Research, Scholarship, and Creative Expression - Make meaningful contributions in their chosen field, participating in use-inspired research, scholarship or creative activity as an individual or in a collaborative effort.