

## **PHYS 684 - Intro to High Energy Physics**

Spring 2016

Professor Jahred Adelman [jahred.adelman@niu.edu](mailto:jahred.adelman@niu.edu)

3 units, MW 6-715 pm LaTourette 227

**Course website** (for homework, syllabus and lecture notes):

<http://nicadd.niu.edu/~jahreda/phys684/index.html>

**Office hours:** Faraday 220, Monday and Wednesday 3-4 pm or by appointment

Preferred method of communication: email

Required text: Introduction to Elementary Particles (Griffiths)

Optional supplemental text: Modern Particle Physics (Thomson)

**Expected knowledge:** Good background in quantum mechanics and special relativity

**Enrollment prerequisites:** PHYS 561 or professor's consent

The course will closely follow Griffiths, with a few exceptions. In particular, material to be covered:

1. History of particle physics
2. Particle dynamics and SM overview
3. How do particle physics detectors work?
4. Relativistic kinematics
5. Symmetries
6. Bound states of quarks
7. Feynman rules
8. QED
9. QCD
10. Weak Interactions
11. Gauge theories + Higgs mechanism
12. "Real" particle physics - what does that mean?

**Problem sets/assignments** will be given every 1-2 weeks, as we finish up material, and will be due 1 week later. **Late assignments NOT accepted** at all. If you have other circumstances, talk to me, but I reserve the right to not accept any assignment after class finishes on the due date.

**Working on the homework:** The homework should be started early. If you have any trouble with it, come to office hours and/or ask for help. We will briefly go over some of the homework solutions after I return them. Ask (in class or during office hours) if you have trouble understanding any of the solutions

**Attendance:** I will not take attendance, but you can't hand in homework without being in class, and you will not do well if you do not follow the coursework. I do understand of course that attendance in the evenings can sometimes be problematic, which is why I will post lecture notes after every subject. But if you want to hand in homework and you are not in class, you must get it to me early, not late

**Plagiarism** in physics classes (and how to receive full credit for your hard work): I don't want to prevent you from working with others, but simply asking a fellow student for answers is a form of plagiarism. Similarly, so are finding solutions on the web. In any case, you will only receive credit on assignments if you show all your work.

**Grading:** Each problem set will have equal weight in the final grade.  
Problem sets/assignments: 75% of total grade  
Final take-home assignment: 25% of total grade

Grading scheme (I reserve the right to shift this scale, but only in the direction that would improve your grade):

A: 85-100%  
A-: 78-85%  
B+: 70-77%  
B: 62-69%  
B-: 56-61%  
C+: 48-55%  
C: 40-47%  
D: 25-39%  
F: 25% or less

**The class:** I will post slides from the previous week ~once a week or so. This should not be considered a substitute for note-taking, but can hopefully help you in preparations for exams and homework. Most of the

material I go over will be in the slides, but occasionally we will also work out some problems together on the (physical!) blackboard.

**Food in the classroom:** It's close to dinner time, but please either avoid food+drink in the classroom or be extra careful and extra quiet. If you are being disruptive or too noisy I will ask you to hold out until the end of class or will ask you to leave the classroom.

**Phones and electronics:** If your phone rings, we will know that it was you (this is a small class)! And if you are using your phone in class, I will see you, and I will call you out on it.

**Disability statement:** If you need an accommodation for this class, please contact the Disability Resource Center as soon as possible. The DRC coordinates accommodations for students with disabilities. It is located on the 4th floor of the Health Services Building, and can be reached at 815-753-1303 (V) or [drc@niu.edu](mailto:drc@niu.edu). Also, please contact me privately as soon as possible so we can discuss your accommodations. The sooner you let us know your needs, the sooner we can assist you in achieving your learning goals in this course.