

# PHYS 6802 - Introduction to Elementary Particle Physics

## *Spring 2018 (Prof. Hill)*

### **Instructor:**

**Christopher S Hill**

Professor

Department of Physics

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### **Office Hour(s):**

TBD in PRB 3048

### **Class Meeting Days, Time, Location:**

Lectures are in PRB 3041 MW 3:00-5:00

### **Course Description:**

This course is open to advanced undergraduates and beginning graduate students. It assumes no prior knowledge of particle physics and will cover the following:

*Symmetries and group theory, relativistic QM, particle detectors and experiments, Feynman diagrams, the particles of the SM and the gauge theories of their interactions — charged leptons, photons, and QED; gluons, quarks, and the strong force (QCD); neutrinos, W/Z bosons and the weak force; the Higgs boson and the Higgs mechanism.*

### **Required Text (TBC):**

“*Concepts of Elementary Particle Physics*” by Micheal E. Peskin (SLAC),

The author has kindly made this available as a free pdf at [http://www.slac.stanford.edu/~mpeskin/](http://www.slac.stanford.edu/~mpeskin/Physics152/theBook.pdf)

[Physics152/theBook.pdf](http://www.slac.stanford.edu/~mpeskin/Physics152/theBook.pdf)

### **Supplementary Texts (*not required*):**

“*Introduction to Elementary Particles*” by David Griffiths

“*Modern Particle Physics*” by Mark Thomson

### **Homework:**

There will be 4 HW assignments each worth 15%. HW is due in class on the date given in the assignment, which will usually be the Monday class session. A tentative schedule is given below. Late HW will not be accepted.

## **Exams (TBD):**

There will be a final exam, either scheduled by the registrar or a take-home (TBD).

## **Grading:**

Course grades will be assigned A-E according to the *OSU Standard Grading Scheme* as follows:

Final - 40%

HW - 60%

## **Tentative Schedule:**

### **Week 1:**

Read/Lectures on Chapters 1,2

### **Week 2:**

Read/Lectures on Chapter 3

### **Week 3:**

Read/Lectures on Chapter 5 (*we will skip Chapter 4*)

HW #1 due

### **Week 4:**

Read/Lectures on Chapter 6

### **Week 5:**

Read/Lectures on Chapter 7

### **Week 6:**

Read/Lectures on Chapter 8

HW #2 due

### **Week 7:**

Read/Lectures on Chapter 10 (*we will skip Chapter 9*)

### **Week 8:**

Read/Lectures on Chapter 11 (*we will skip Chapter 12*)

### **Week 9:**

Read/Lectures on Chapter 13

HW #3 due

### **Week 10:**

Read/Lectures on Chapter 14

### **Week 11:**

Read/Lectures on Chapter 15

**Week 12:**

Read/Lectures on Chapter 16

HW #4 due

**Week 13:**

Read/Lectures on Chapter 17

**Week 14:**

Read/Lectures on Chapter 21 (*we will skip Chapter 18, 19, 20*)

**Week 15:**

Review

*Final exam*

**Attendance Policy:**

Attendance in class is mandatory, except when excused by prior arrangement or due to documented illness.

**Academic Misconduct Policy:**

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

**Disability Services:**

Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, [slds@osu.edu](mailto:slds@osu.edu).

**Additional Information:**

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, *Kellie Brennan*, at [titleix@osu.edu](mailto:titleix@osu.edu)

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.