**PHYSICS 585, Section 01 – Spring 2016**

**Elementary Particle Physics**

**Section 01:** 5:30 – 6:45 pm, Mon & Wed (NS 128)  
**Instructor:** Dr. Swagato Banerjee  
**Office:** Natural Science 210  
**Phone:** 502-852-0915  
**Email:** swagato.banerjee@louisville.edu  
**Suggested textbook:** *Modern Elementary Particle Physics, by Gordon Kane*  
**Tentative Office Hours:** M 4:30 - 5:30 pm W 4:30 – 5:30 pm, or by appointment

*Office hours this semester will be held in NS 210*

**Course:**

- This is a one-semester course on elementary particle physics. This course will focus on the basic concepts and methods of physics as applied in the study of properties of elementary particles, detectors and accelerators, weak and electromagnetic interactions, quark model of hadrons, strong interactions, and the Standard Model of particle physics. The pace of the course will be intense, as we will study the full zoo of elementary particles: electron, proton, neutron, positron, muon, pion, kaon, quark, neutrino, tau, W, Z and the Higgs boson.

- PHYS 585 has PHYS 541 (Electromagnetic Fields) as pre-requisite. You are expected to know electrostatic and magnetostatic fields in free space and in material media, solutions of Poisson's equation, time dependent fields, Maxwell's equations.

- PHYS 585 has PHYS 555 (Elementary Quantum Mechanics) as pre-requisite. You are expected to know general concepts of quantum mechanics, Schrodinger equation and solutions in one, two and three-dimensions, hydrogen atom, and orbital angular momentum.

- This is a three credit-hour course. There are two 75-minute lectures each week. *You are expected to attend all lecture classes and engage the material while you are there.* Merely being in the classroom is not enough to learn the material.

- **There are several good reference books for this class.** You are welcome to browse through any/all of the excellent books by: David Griffiths, Donald H. Perkins, Francis Halzen and Alan Martin, I. S. Hughes, Frank Close, etc.

- The lecture notes should provide pointers to the materials covered during the course. However, some derivations may be skipped and may not be assigned as homework. If you are unable to follow such materials, please inform me, so that I keep the course in tune with your background. Early feedback is essential.
Important Dates:

- **Tuesday, January 12** – Final date for adding or dropping a course
- **Monday, January 18** – *No class/office hour* – Martin Luther King Holiday
- **Wednesday, February 17 or Monday, February 29** – MidTerm Exam
- **Monday, March 7** – Final date for withdrawing from a course
- **Sunday, March 13** – Daylight Saving time starts [clocks spring forth 1 hour]
- **Monday & Wednesday, Mar 14 & 16** – *No class/office hour* – Spring break
- **Wednesday, April 20** – Last Day of Class
- **Wednesday, April 27** – Final Exam

Classroom Policies:

- **Check your university e-mail account daily.** It is the way that I will communicate with you outside of class.
- **Please refrain from using cell phones during class as much as possible.**
- One of the skills you will be expected to exhibit is an ability to communicate your thinking in writing up the solution to a physics problem. Students will be expected to:
  1. Identify the general principle involved either by words or by equation.
  2. Provides sufficient mathematical detail.
  3. Includes units in the final answer.
  4. Includes comments relevant to demonstrate your reasoning.

Homework:

- **Homework will be worth 50 points in total (10 sets of 5 points each).**
- **Partial credit is possible. Arguing for partial credit can cost negative point(s).**
- Late homeworks will be accepted without penalty **until Friday April 22 (noon).**
- Email me for solutions. **DO NOT SHARE SOLUTIONS WITH OTHERS.**
- The assignment each week is designed for you to learn how to solve the types of physics problems that you will see on an exam. The assignment will give you the opportunity to assess how comfortable you are with the material prior to the exam. No hints or feedback will be provided. There is no time limit for how long you will have to work on the assignment, but learning to pace yourself will help complete the mid-term and final exams in time.
- It is essential that you solve the homework problems to ensure that you understand the concepts and to strengthen your math skills. **Working on the homework is designed to be where you learn how to work the problems. It is imperative that you figure out FOR YOURSELF how to work the problems.**
Exams:

• This course will have in-class mid term exams during the semester and a final exam, each worth 25 points [calculator ok, closed book, closed notes].
• Make-up exams will only be given in extreme situations. Whether or not a situation is extreme is left to the discretion of the instructor. In all such cases, written verification will be required.
• Cell phones are NOT allowed during exam.

Grading:

Your final grade will be based upon the total number of points you receive out of the 100 total points possible = Homework (50) + MidTerm (25) + Final Exam (25). If the total number of points you receive is greater than the point listed below:

A>=85 A->=80 B+=75 B>=70 B->=65 C+=60 C>=55 C->=50 D>=45 F<45

then, you are guaranteed the associated letter grade. A+ is at instructor’s discretion.

In general, there will be no curving of individual exam grades, but the instructor reserve the right to re-adjust the grading scale if it seems appropriate. It is theoretically possible for everyone to get an A (or an F) grade. Your performance depends only on how you do, not on how everyone else performs in the class.

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Policy on Instructional Modifications: Students with disabilities, who need reasonable modifications to complete assignments successfully and otherwise satisfy course criteria, are encouraged to meet with the instructor as early in the course as possible to identify and plan specific accommodations. Students will be asked to supply a letter from the Disability Resource Center to assist in planning modifications.
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Title IX/Clery Act Notification

Sexual misconduct (sexual harassment, sexual assault, and sexual/dating/domestic violence) and sex discrimination are violations of University policies. Anyone experiencing sexual misconduct and/or sex discrimination has the right to obtain confidential support from the PEACC Program 852-2663, Counseling Center 852-6585 and Campus Health Services 852-6479.

Reporting your experience or incident to any other University employee (including, but not limited to, professors and instructors) is an official, non-confidential report to the University. To file an official report, please contact the Dean of Student’s Office 852-5787 and/or the University of Louisville Police Department 852-6111. For more information regarding your rights as a victim of sexual misconduct, see the Sexual Misconduct Resource Guide (http://louisville.edu/hr/employeerelations/sexual-misconduct-brochure).
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