

**PHYS 2212**

**Instructor:**

**Calculus-Based Physics II**

Dr. David Joffe

office - SC 529

email - [djoffe@kennesaw.edu](mailto:djoffe@kennesaw.edu)

web - [science.kennesaw.edu/~djoffe](http://science.kennesaw.edu/~djoffe)

**Spring 2015**

**Prerequisite:**

**PHYS 2211** (Calculus Based Physics I)

*Students must complete the prerequisite courses with a grade of "C" or better before taking PHYS 2212*

**Textbook:**

Serway and Jewett

*Physics for Scientists and Engineers 9<sup>th</sup> Edition*

**Laboratory Manual:**

Custom Labs, available for download online

**Lecture:**

TR at 8 am, with labs following lectures

## Catalog Description

The Principles of Physics sequence (PHYS 2211 and PHYS 2212) is a survey of the primary fields of physics: mechanics, electromagnetism, optics, thermodynamics, and modern physics. Elementary calculus will be used in the course, with laboratory exercises supplementing the lecture material. The first course of the sequence will focus on the field of classical mechanics and its applications as well as basic thermal physics.

## Course Objectives

- 1) Be able to describe the concept of electric flux and apply Gauss' Law to solve for the electric field in various circumstances.
- 2) Be able to distinguish electric potential energy from electric potential and voltage.
- 3) Be able to describe the motion of single particles subjected to a magnetic force according to the Lorentz force law.
- 4) Be able to describe and apply Ohm's Law and the concept of resistance and apply energy and charge conservation in direct current circuits.
- 5) Be able to describe how currents give rise to magnetic fields and be able to apply Ampere's Law where appropriate.
- 6) Be able to describe Faraday's Law of Induction and apply it in various contexts.
- 7) Be able to describe the behavior of both direct and alternating current circuits.
- 8) Be able to explain the origin of the displacement current and the origin of electromagnetic waves.
- 9) Be able to identify Maxwell's Equations in integral form and explain their meaning in words.
- 10) Be able to identify the characteristics of wave behavior and distinguish interference and diffraction.
- 11) Be able to explain why classical physics fails to account for atomic phenomena and be able to describe the historical development of Quantum Theory
- 12) Be able to explain why classical physics fails at high velocities.
- 13) Be able to use Special Relativity to explain length contraction and time dilation at high velocities.
- 14) Be able to explain the origin of the uncertainty principle and apply it in various contexts.
- 15) Be able to describe the nature of experimental design, distinguish random vs. systematic errors and explain error propagation.

## Academic Integrity Statement

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the university's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to university materials, misrepresentation/falsification of university records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the Department of Student Conduct and Academic Integrity (SCAI), which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement. See also <http://www.kennesaw.edu/scai/content/ksu-student-code-conduct>.

## Disabled Student Support Services

Kennesaw State University provides program accessibility and reasonable accommodations for persons defined as disabled under Section 504 of the Rehabilitation Act of 1973 or the Americans with Disabilities Act of 1990. A number of services are available to help disabled students with their academic work. In order to make arrangements for special services, students must visit the Office of Disabled Student Support Services and arrange an individual assistance plan. Certification of disability is required. Please contact the Office of Disabled Student Support Services for more information.

## Assessment

PHYS 1112 [or 2212, as appropriate] satisfies one of Kennesaw State University's General Education program requirements. It addresses the Natural Sciences learning outcome. That learning outcome states: Students will use scientific reasoning to understand physical and/or life science phenomena. For more information about KSU's General Education program requirements and associated learning outcomes, please visit [http://catalog.kennesaw.edu/preview\\_program.php?catoid=19&poid=2041](http://catalog.kennesaw.edu/preview_program.php?catoid=19&poid=2041)

Kennesaw State University is currently engaged in a campus-wide assessment of its general education program. The purpose is to measure student achievement with respect to faculty defined student learning outcomes. This course has been selected to participate in the process. No individually-identifiable student information will be collected as part of the assessment. Data will be reported only in aggregated form. Students should know that the data may be used for scholarly work by members of KSU faculty (but only in anonymous and aggregated form). If you are opposed to having your anonymous data used for scholarly work, you can "opt out" of this specific aspect of the process. For more information on the general education assessment process and for access to an "opt out" form, please click the following link: <http://kennesaw.edu/curriculum/gen-ed-assessment.html>

## Academic Withdrawl Policy – Spring Semester 2015

Students may withdraw from one or more courses anytime before the last three weeks of the semester. *However, as of Fall 2004, students will be allowed a maximum of eight total withdrawals if they enter KSU as a freshman. Transfer students will be allowed one withdrawal per fifteen credit hours attempted, for a maximum of eight.* Students who choose to pursue a second degree at KSU will be allowed two additional withdrawals. Students who entered KSU before the Fall of 2004 will be allowed one withdrawal per fifteen credit hours attempted for a maximum of eight. To withdraw, the student should complete an official withdrawal form in the Office of the Registrar. Students who officially withdraw from courses on or before the last day to withdraw without academic penalty will receive a "W". Students who officially withdraw after the last day to withdraw without academic penalty (and before the last three weeks of the semester) will receive a "WF", which will be counted as an "F" in calculation of their grade point average. The only exceptions to these withdrawal regulations will be for instances involving unusual circumstances, which are fully documented. *Students may appeal to the academic standing committee for consideration of unusual circumstances.*

### General Class Policies

1. You must study assigned chapters in the textbook and other assigned readings before the lecture in which they are discussed.
2. Regular lecture attendance is essential for success in this class. If you must miss class, it is your responsibility to get the notes you miss from another student.
3. Be on time for class.
4. Cellular telephones, pagers, and similar devices must be turned off or placed in silent mode during class. Use of cell phones should be restricted to emergencies.
5. During lecture, avoid conversation and other disruptions that distract other students from listening and learning. If you have a question or comment, direct it to the professor.
6. Occasionally, it may be necessary for the instructor to make corrections or changes to the syllabus. Corrections or changes to the syllabus will be announced in class.

### Laboratory Policies

1. **Laboratory attendance is required.** The instructor must give approval for non-emergency absences prior to the lab time. There is no make up for lab work missed due to unexcused absence. Lab reports will not be accepted for lab exercises not completed.
2. You must plan to attend laboratory for the full period each lab session.
3. Students are required to obey all safety regulations during laboratory, as published in the laboratory safety handout and posted in the laboratory. In particular:
  - **Food and beverages are not permitted in the laboratory. This includes unopened food packages and beverage containers.**
  - **Open-toed shoes, open-heeled shoes, sandals, and bare feet are prohibited. Open shoes and sandals are prohibited even when worn with socks. Students must come to lab on time with proper clothing.**
  - **All waste must be disposed in properly labeled containers as directed by the instructor or lab assistant.**

### Examination and Grading Policies

1. The grade in this class is determined by the total number of points earned on examinations, homework, and laboratory work as listed below in "Grade Determination."
2. Examinations and homework may consist of multiple-choice questions, short-answer questions, and problem solving questions. Exam questions cover lecture, assigned readings, and laboratory material. The final examination is comprehensive.
4. **Makeup policy:** Makeup examinations will only be given for non-emergency excused absences when the student has contacted the instructor prior to the examination. Written verification for the reason the exam is missed will be required.

### **Grade Determination**

8 Labs at 2.5% each	= 20%
4 Homework sets at 2.5% each	= 10%
2 Mid-term Exams at 15% each	= 30%
Final Exam	= 40 %
<hr/>	
Total	100%

Grade scale: A = 90 – 100 % of total points; B = 80 – 89 %; C = 70 – 79 %; D = 60 – 69 %; F = Below 60 %.

**Last Date to Withdraw Without Academic Penalty, Spring 2015:**

**March 3, 2015**