General Physics w/ Cal II

PH 106 Section 100
Summer 2014, Lecture
Dr. Paulo Araujo

Office Hours and Contact Information
Paulo T. Araujo: Tuesday/Wednesday/Thursday, 4-5 pm. For other times, make an appointment.
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Prerequisites

Prerequisite(s): MATH 126 or MATH 146; and PH 101 or PH 105 or PH 125.
Course Description

Lecture and laboratory. Introductory calculus-based course in classical physics, including electricity, magnetism, and optics. Degree credit can only be awarded for one of the following: PH 102, PH 106, or PH 126.

Core Designations:

Natural Science

Student Learning Outcomes

PH 106 - General Physics with Calculus II

Upon successful completion of the course, you should have a basic introductory understanding of classical electricity on both a qualitative and quantitative level. You should be able to solve basic problems using mathematics through differential and integral calculus. You should then have the necessary background so that you can take modern physics.

The anticipated General Outcomes are:

- Students will be able to recognize and explain the scientific method, and evaluate scientific information.
- Students will be able to collaborate and perform effectively in team activities.

Course-specific learning outcomes

1. Conceptual understanding:
   - You should be able to answer conceptual questions which require a solid understanding of electrical and magnetic forces.
   - You should be able to apply the concepts of electric fields and electric potential to relevant problems.
   - You should be able to apply the concepts of magnetic fields to relevant problems.

2. Application of basics laws of physics: You should be able to apply the laws of physics to formulate a solution to a problem.

3. Analysis of electric circuits: You should be able to analyze electric circuits and predict their function.

4. Knowledge of optics: You should be able to solve problems which require the knowledge of ray optics and optical image formation.

Required Texts
**UA Supply Store Textbook Information**

HALLIDAY / FUNDAMENTALS OF PHYSICS VOL 2 *(Required)*

For PH106 we will be using HALLIDAY / FUNDAMENTALS OF PHYSICS VOL 2 (required). No webassign is required.

**Other Course Materials**

Eventually, other course materials will be discussed and made available on Blackboard learn.

**Outline of Topics**

- Electricity
- Magnetism
- Dynamics
- Optics

**Class schedule**

PH 106 – Class Schedule – Summer/2014

Dr. Paulo T. Araujo

For PH106 we will be using HALLIDAY / FUNDAMENTALS OF PHYSICS VOL 2 (required)

LAB materials and schedule at: [http://physics.ua.edu/lab10x/106pdf.html](http://physics.ua.edu/lab10x/106pdf.html)

**July:**

- **Wednesday – 07/02** – Chapters 21 and 22: Electric Charge and Electric Fields.
  
  **LAB:** [http://physics.ua.edu/lab10x/106pdf.html](http://physics.ua.edu/lab10x/106pdf.html).

  **Quiz:** No quiz.

- **Thursday – 07/03** – Chapter 22: Electric Fields.
  
  **LAB:** [http://physics.ua.edu/lab10x/106pdf.html](http://physics.ua.edu/lab10x/106pdf.html).

  **Quiz:** No quiz.

- **Friday – 07/04** – No Classes (July 4th)
Monday – 07/07 – Chapter 23: Gauss’ Law.

LAB: [link](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Lecture Quiz: 15 minutes (duration).

Tuesday – 07/08 – Chapters 23 and 24: Gauss’ Law and Electric Potential.

Wednesday – 07/09 – Chapter 24: Electric Potential.

LAB: [link](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Lecture Quiz: 15 minutes (duration).

Thursday – 07/10 – Chapter 25: Capacitance.

LAB: [link](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Exam 1 (Chapters 21, 22 and 23) – 50 minutes (duration).

Friday – 07/11 – Chapter 26: Current and Resistance.

Monday – 07/14 – Chapter 27: Circuits.

LAB: [link](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Lecture Quiz: 15 minutes (duration).

Tuesday – 07/15 – Chapter 27: Circuits.

Wednesday – 07/16 – Chapters 28: Magnetic Fields.

LAB: [link](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Lecture Quiz: 15 minutes (duration).

Thursday – 07/17 – Chapters 28: Magnetic Fields.

LAB: [link](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).
Exam 2 (Chapters 24, 25, and 26) – 50 minutes (duration).

- **Friday – 07/18** – Chapter 29: Magnetic Fields due to Currents.

- **Monday – 07/21** – Chapter 29: Magnetic Fields due to Currents.

**LAB:** [http://physics.ua.edu/lab10x/106pdf.html](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Lecture Quiz: 15 minutes (duration).

- **Tuesday – 07/22** – Chapter 30: Induction and Inductance.
- **Wednesday – 07/23** – Chapters 30 and 32: Induction and Inductance and Maxwell's Equations; Magnetism of Matter.

**LAB:** [http://physics.ua.edu/lab10x/106pdf.html](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Lecture Quiz: 15 minutes (duration).

- **Thursday – 07/24** – Chapter 32: Maxwell's Equations; Magnetism of Matter.

**LAB:** [http://physics.ua.edu/lab10x/106pdf.html](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Exam 3 (Chapters 28, 29 and 30) – 50 minutes (duration).

- **Friday – 07/25** – Chapter 33: Electromagnetic Waves.

- **Monday – 07/28** – Chapter 33: Electromagnetic Waves.

**LAB:** [http://physics.ua.edu/lab10x/106pdf.html](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Lecture Quiz: 15 minutes (duration).

- **Tuesday – 07/29** – Discussion of problems.
- **Wednesday – 07/30** – Discussion of problems.

**LAB:** [http://physics.ua.edu/lab10x/106pdf.html](http://physics.ua.edu/lab10x/106pdf.html).

Lab Quiz: 10 minutes (duration).

Lecture Quiz: 15 minutes (duration).
Thursday – 07/31 – Final Exam – Time: from 2 pm to 4:30 pm (two hours and half of duration).

Exams and Assignments

Exams:

There will be three major semester exams and a final exam. The exams will be happening during the last 50 minutes of the lab activity (from 11:00 to 11:50 am).

Labs:

There will be lab activities from 9:00 to 11:50 am each Monday, Wednesday and Thursday. The students will perform the experiments in class. However, they will be able to work on the report at home and deliver it the day after the activity.

Quizzes:

Every Monday, Wednesday and Thursday in the beginning of the lab sessions (first 10 minutes) there will be quizzes on the materials covered during the lab.

Also, every Monday, Wednesday and Thursday in the first 15 minutes of the lecture sessions there will be quizzes related to the materials covered during the classes. Note that the quiz on Monday is related to the material we will be seeing throughout the week. This material will be informed to you every Friday antecedent to the quiz.

Grading Policy

Exams:

- Exam 1 - 15 points.
- Exam 2 - 15 points.
- Exam 3 - 15 points.
- Final Exam - 20 points.

Labs: 15 points.

Lab Quizzes: 5 points.

Lecture Quizzes: 15 points.

Policy on Missed Exams & Coursework
No makeup of in-class work or exams will be given. If you have a legitimate reason for missing a major exam, then you must inform me as soon as possible. If the reason is acceptable, then the final exam will count proportionately more.

**Attendance Policy**

Attendance is not strictly required except for the four major exams and homework questions each Friday. However, since graded material is collected during most classes, it is critically important that you attend nearly all classes. The policy described above on missed exams and coursework allows a limited number of missed classes without penalty.

**Emergency Contact Information**

UA's primary communication tool for sending out information is through its web site at [www.ua.edu](http://www.ua.edu). In the event of an emergency, students should consult this site for further directions. Additional course information will be posted using Blackboard Learn.

**Severe Weather Guidelines**

The guiding principle at The University of Alabama is to promote the personal safety of our students, faculty and staff during severe weather events. It is impossible to develop policies which anticipate every weather-related emergency. These guidelines are intended to provide additional assistance for responding to severe weather on campus.

UA is a residential campus with many students living on or near campus. In general classes will remain in session until the National Weather Service issues safety warnings for the city of Tuscaloosa. Clearly, some students and faculty commute from adjacent counties. These counties may experience weather related problems not encountered in Tuscaloosa. Individuals should follow the advice of the National Weather Service for that area taking the necessary precautions to ensure personal safety. Whenever the National Weather Service and the Emergency Management Agency issue a warning, people in the path of the storm (tornado or severe thunderstorm) should take immediate life saving actions.

When West Alabama is under a severe weather advisory, conditions can change rapidly. It is imperative to get to where you can receive information from the National Weather Service and to follow the instructions provided. Personal safety should dictate the actions that faculty, staff and students take.

The Office of University Relations will disseminate the latest information regarding conditions on campus in the following ways:

- Weather advisory posted on the UA homepage
- Weather advisory sent out through UA Alerts to faculty, staff and students
- Weather advisory broadcast over WVUA at 90.7 FM
- Weather advisory broadcast over Alabama Public Radio (WUAL) at 91.5 FM
- Weather advisory broadcast over WVUA-TV/WUOA-TV, and on the website
at http://wvuatv.com/content/weather. WVUA-TV Home Team Weather provides a free service you can subscribe to which allows you to receive weather warnings for Tuscaloosa via e-mail or cell phone. Check http://wvuatv.com/content/free-email-weather-alerts for more details and to sign up for weather alerts.

In the case of a tornado warning (tornado has been sighted or detected by radar; sirens activated), all university activities are automatically suspended, including all classes and laboratories. If you are in a building, please move immediately to the lowest level and toward the center of the building away from windows (interior classrooms, offices, or corridors) and remain there until the tornado warning has expired. Classes in session when the tornado warning is issued can resume immediately after the warning has expired at the discretion of the instructor. Classes that have not yet begun will resume 30 minutes after the tornado warning has expired provided at least half of the class period remains.

Disability Statement

If you are registered with the Office of Disability Services, please make an appointment with me as soon as possible to discuss any course accommodations that may be necessary.

If you have a disability, but have not contacted the Office of Disability Services, please call (205) 348-4285 (Voice) or (205) 348-3081 (TTY) or visit 133-B Martha Parham Hall East to register for services. Students who may need course adaptations because of a disability are welcome to make an appointment to see me during office hours. Students with disabilities must be registered with the Office of Disability Services, 133-B Martha Parham Hall East, before receiving academic adjustments.

Policy on Academic Misconduct

All students in attendance at The University of Alabama are expected to be honorable and to observe standards of conduct appropriate to a community of scholars. The University of Alabama expects from its students a higher standard of conduct than the minimum required to avoid discipline. At the beginning of each semester and on examinations and projects, the professor, department, or division may require that each student sign the following Academic Honor Pledge: “I promise or affirm that I will not at any time be involved with cheating, plagiarism, fabrication, or misrepresentation while enrolled as a student at The University of Alabama. I have read the Academic Honor Code, which explains disciplinary procedure resulting from the aforementioned. I understand that violation of this code will result in penalties as severe as indefinite suspension from the University.”

See the Code of Student Conduct for more information.