

Physics 211 (Fall 2015)

(4 Credit Hours)

General Physics II

Syllabus available on BlackBoard

<http://webcourses.niu.edu/>

under Course information

- **Name:** Prof. Omar Chmaissem (sha-my-sim)
(You can call me Omar)
- **Email:** Chmaissem@niu.edu **Preferred method**
- **Tel:** (815) 753-6476 ????
- **Don't leave voice messages.**
- **Fax:** (815) 753-8565

DO NOT USE my Argonne National Lab Email Address (anl.gov). I will not reply to these emails.

- **We will meet 2 times a week (in FW 200):**
Tuesdays and Thursdays from
11:00 AM to 12:15 PM
- **Office hours (FW 210):**
On most meeting days, I will be available up to
at least 1 hour before and 1 hour after class.
Please see me for other meeting times as
needed.

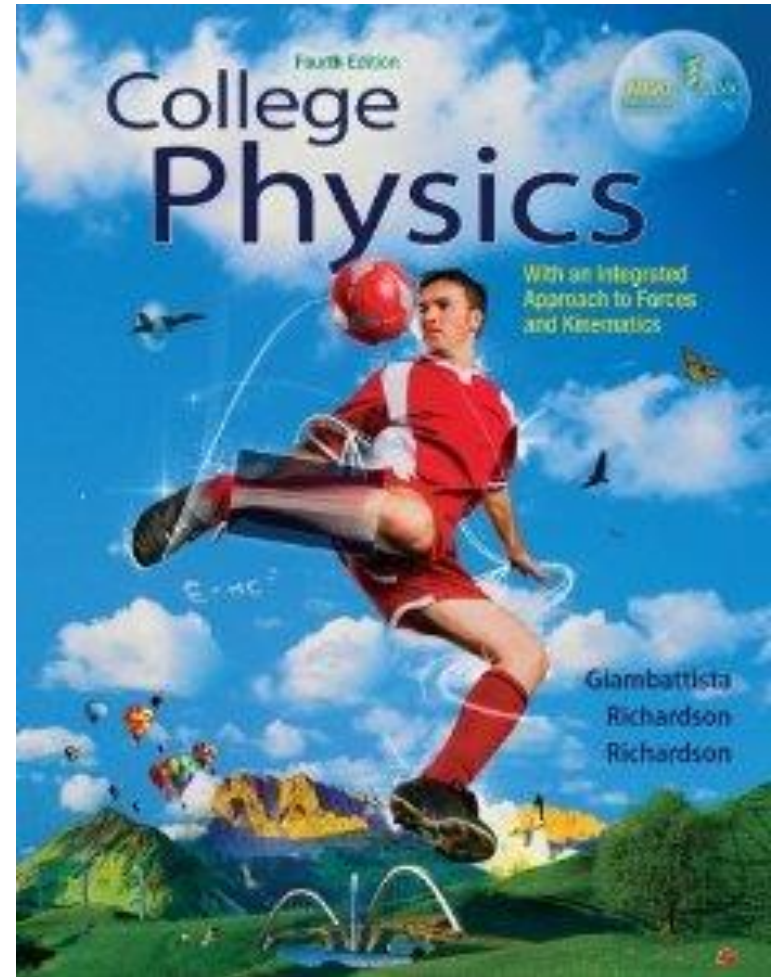
Lab Sections

- Labs are 2 hrs 50 min long.
- We have 5 Lab Sections.
- Separate Lab Rules and instructions will be covered by your TA's.
- Sections meet on the following days:
 - **M (section B) 6:00 to 8:50 PM** **TA: Shane Sullivan**
 - **W (section C) 9:00 to 11:50 AM** **TA: Jacob Kalnins**
 - **W (section E) 12:00 to 2:50 PM** **TA: Nilanjana Kumar**
 - **W (section A) 6:00 to 8:50 PM** **TA: Jacob Kalnins**
 - **F (section D) 12:00 to 2:50 PM** **TA: Shane Sullivan**

Bedtime Reading!

- **Textbook:**
***College Physics*, Giambattista,
Richardson, Richardson
4th edition, 2012**

**Either the full version or
volume 2 are fine**



The Importance of Attending Class

You should come to class because there's a lot that I'll say that won't be in the Power Point files; and which will be on the tests.

In the past, people who have skipped a lot of classes have received very bad grades. Conversely, people who've come to most or all of the classes nearly always receive A's and B's.

Grade determined by:

- **Test:** 40%. Tests cover about 2-3 chapters. Dates will be announced in class. **No make up tests for any reason.**
- **Lab:** 25% (a minimum average lab grade of 60% is required. You will **fail** the course if your lab score falls below this mark.) Likewise, you will **fail** the course if you don't satisfy all coursework requirements as described here and throughout the syllabus.
Make sure you check your report(s) in a timely manner (Lab schedule and lab rules will be separately posted on Blackboard).
- **Final exam:** 25%
A score of less than 50% on the final exam will result in failing the class regardless of your overall performance.
[Tues. December 8, 10-11:50 a.m.]
- **Homework:** 10%. Includes any type of HW assignments and participation. **See notes for rules.**

- **Note 1:** HW deadlines are **RIGID**, no late HW will be accepted.
- **Note 2:** Not all HW assignments would necessarily be graded. Likewise, not all HW problems would necessarily be graded.
- **Note 3:** It's your responsibility to solve and understand all solved strategic examples and problems found within each chapter
- **Note 4:** There will absolutely be no make-up tests. Likewise tests cannot be taken at a different time for whatever reason. However, in the case of convincing and well-documented emergencies (see note 5 below), the missed test grade **may** be dropped. Do not assume that this is automatic. Note that if I offer the whole class to drop the lowest test grade then your "missed emergency score" will be considered your lowest score. No exceptions.
- **Note 5:** I have to see a convincing evidence that the emergency is real. I have seen many **fake** doctor's or nurse's notes and I know how to distinguish real from fake. Contested evidence may be referred to the University Judicial Office for final judgment.

- **Note 6:** Final exam may be rescheduled within 48 hours only in case of a well-documented and convincing emergency as described in note 4.
- **Note 7:** No newspapers or electronic devices of any kind (Smart phones, tablets, CD players, IPODs, etc) allowed during class time (i.e., during lectures, tests, etc). Small laptops maybe accepted if for using the electronic version of the book but the user must sit in the front rows. No electronics allowed on the tests and final exam other than a calculator.
- **Note 8:** You will fail the test if any device other than a calculator is seen with you during the test. Please make sure that such devices are stowed away. Please avoid embarrassing yourself and placing me in a bad situation.
- **Note 9:** **Cheating and plagiarism are serious offenses.** We will be using SafeAssign/ which determines if any reports (partially or entirely) have been copied from others (including from previous semesters) or from the internet.

Offenders will be referred to the University's Judicial Office.

GRADING SCALE:

Your final letter grade for the semester will be determined based on the following scale:

A 93 – 100%

A- 90 – 92.9%

B+ 87 – 89.9%

B 83 – 86.9%

B- 80 – 82.9%

C+ 74 – 79.9%

C 70 – 73.9%

D 60 – 69.9%

F 0 – 59.9%

COURSE CONTENT

This course consists of fifteen units. Each unit has lectures and demonstrations, a reading quiz, a lab, and exercises covering the material in that unit. At the end of the course there is a final exam covering all the units.

- **The fifteen units are:**
- **Electric Charge**
- **Electric Energy**
- **Circuits**
- **Magnetism**
- **Induction**
- **Alternating Current**
- **Electromagnetic Waves**
- **Light Waves**
- **Optics**
- **Interference**
- **Relativity**
- **Photon**
- **Atoms**
- **Nuclei**
- **Subatomic Particles**

COURSE OBJECTIVES

General objectives are to:

Develop an understanding of the basic concepts and principles in Physics.

Develop critical thinking and a scientific approach to problem solving.

Develop and use mathematical formulations of physical principles.

Prepare the student for the MCAT exam

Specific Objectives - I

Electricity (electric charge, electric energy, circuits)

- Describe the actions of like and unlike charges near each other.
- Use Coulomb's law to find the force on a charge.
- Define electric field, field lines, and equipotential lines.
- Describe the relationship between electric potential and electric field.
- Find the stored charge and energy on one or more capacitors in a circuit.
- Describe the differences between an open circuit, closed circuit, and equivalent circuit.
- Identify batteries, resistors and capacitors in a circuit diagram.
- Use Ohm's law and Kirchhoff's rules to find unknown voltages or currents in a circuit.
- Define the relationships between current, voltage, and electrical power.
- Describe the behavior of a circuit with resistors and capacitors.

Specific Objectives - II

Magnetism (magnetism, induction, alternating current, electromagnetic waves)

- Describe the magnetic field around a magnetic dipole and a wire with current.
- Find the force on a charged particle moving in a magnetic field and electric field.
- Use Ampere's law to find the magnitude of a magnetic field.
- Describe the principles behind motors, generators, and transformers.
- Use Faraday's law and Lenz's law to find the induced emf and current in a wire.
- Identify inductors and ac power sources in a circuit diagram.
- Define reactance, impedance and resonance in an AC circuit.
- Identify the regions of the electromagnetic spectrum.
- Find the energy stored in an electromagnetic field.
- Describe polarization and its effect on intensity.

Specific Objectives - III

Light (light waves, optics, interference relativity)

- Define the relationship between light waves and rays.
- Identify the speed of light and its relation to the index of refraction.
- Use Snell's law and the laws of reflection to find the angle of a light ray due to refraction and reflection.
- Find the size and location of an image formed by a mirror or lens.
- Describe the principles behind compound optical instruments.
- Define refractive power in diopters and magnification.
- Find points of constructive and destructive interference.
- Describe the difference between interference and diffraction.
- Use the Lorentz factor to find the changes in measured time and distance.
- Apply special relativity to find energy and momentum.

Specific Objectives - IV

Quantum Physics (photons, atoms, nuclei, subatomic particles)

- Describe the photoelectric effect and the photon.
- Define the electron volt and Planck's constant.
- Use the Bohr model of the atom to find the energy of emitted and absorbed photons.
- Describe matter waves and the uncertainty principle and their application.
- Find the quantum numbers for electron shells in an atom.
- Define the relationship between mass number, atomic number, protons and neutrons in the nucleus.
- Identify common particles involved in radioactivity and nuclear reactions.
- Use half-life to find the activity due to radioactive decay.
- Describe nuclear fission and fusion.
- Identify the fundamental particles of the Standard Model.

More Important Notices

- This is a tentative Syllabus which is subject to change whenever needed or required. **The grading scale and scheme will not change unless there's a typo.** You will be informed in class if any modifications are warranted.
- Syllabus and grading scheme is designed for students completing the full semester. Withdrawal grades are calculated differently. Please consult with me before withdrawing.
- If dropping the course, please make sure you do so before the official deadline; otherwise, a WF will be recorded on your transcripts.

Accessibility

Northern Illinois University is committed to providing an accessible educational environment in collaboration with the Disability Resource Center (DRC). Any student requiring an academic accommodation due to a disability should let his or her faculty member know as soon as possible. Students who need academic accommodations based on the impact of a disability will be encouraged to contact the DRC if they have not done so already. The DRC is located on the 4th floor of the Health Services Building, and can be reached at 815-753-1303 (V) or drc@niu.edu.

I look forward to talking with you to learn how I may be helpful in enhancing your academic success in this course.

Academic Integrity

Academic Integrity: As detailed in the current NIU undergraduate catalog: *Good academic work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced is regarded by the faculty and administration as a serious offense. Students are considered to have cheated if they copy the work of another during an examination or turn in a paper or an assignment written, in whole or in part, by someone else. Students are responsible for plagiarism, intentional or not, if they copy material from books, magazines, or other sources without identifying and acknowledging those sources or if they paraphrase ideas from such sources without acknowledging them. Students responsible for, or assisting others in, either cheating or plagiarism on an assignment, quiz, or examination may receive a grade of F for the course involved and may be suspended or dismissed from the university.*

*A faculty member has original jurisdiction over any instances of academic misconduct that occur in a course which the faculty member is teaching. The student shall be given the opportunity to resolve the matter in meetings with the faculty member and the department chair. If the facts of the incident are not disputed by the student, the faculty member may elect to resolve the matter at that level by levying a sanction no greater than an F for that course. The faculty member shall notify the student in writing whenever such action is taken, and the **Office of Community Standards and Student Conduct** shall receive a copy of the Academic Misconduct Incident Report indicating final disposition of the case, which will be placed in the student's judicial file. In all matters where the charge of academic misconduct is disputed by the student or if the faculty member feels a sanction greater than an F in the course is appropriate (such as repeated offenses or flagrant violations), the faculty member shall refer the matter to the Office of Community Standards and Student Conduct making use of the Academic Misconduct Incident Report. Additional sanctions greater than an F in a course can be levied only through the University Judicial System. With regards to finding the student either responsible or not responsible for his or her action, the ruling of the Judicial Hearing Board shall be binding. In cases where there is either a finding of responsibility or an admission of responsibility by the student, any recommendations by the hearing board regarding the course grade are non-binding on the instructor, who remains solely responsible for assigning a course grade, consistent with the policies set forth in the course syllabus.*

Understanding the ideas of each lecture requires the knowledge of the previous lectures.

If you keep up, you won't end up looking like this the night before the test!

