Physics 273/Physis 252 (Fall 2012)

Fundamentals of Physics II

Syllabus available on BlackBoard
http://webcourses.niu.edu/
under Course information
• **Name:** Prof. Omar Chmaissem (sha-my-sim)  
• **Email:** Chmaissem@niu.edu  
• **Tel:** (815) 753-6476 at NIU  
  Don’t leave phone messages.  
  Email me instead.  
• **Fax:** (815) 753-8565
• We will meet 3 times a week (in FW 200): Monday, Wednesday, and Friday from 12:00 to 12:50 PM

• Office hours (FW 210): By appointment, or anytime when I am in office*.

  * If not too busy!

    Of course, I would let you know
• **Required Textbook:**

Physics for Scientists and Engineers with Modern Physics: 4th Edition Giancoli. (Chapters 21-44)

or

the Full version of the book.
• Grade determined by:

• Quizzes & Participation: 90 points.

• Tests (4): 210 points (70 points each). Tests cover about 3 chapters at a time and will be separately announced in class.

• Homework: 100 points. (see notes)

• Lab (273 students): 100 points (a minimum of 60% required of the total lab grade is required to pass the course) Make sure you collect your report(s) in a timely manner (Lab schedule posted on Blackboard).

• Final exam: 100 points. (Dec. 10, 2012: 12 - 1:50 PM)

• More Extra Credit: Maybe!!!
• **Note 1:** Not all HW assignments would necessarily be graded.

Likewise, *not all HW problems would necessarily be graded.*

• **Note 2:** It’s your responsibility to solve and understand all solved strategic examples and problems found within each chapter.

You are responsible for all equations derived in these problems.
• **Note 3:** There will be absolutely no make-up tests. The lowest test grade will be dropped at the end of the semester. Final exam may be rescheduled only in case of a well-documented and convincing emergency.

• **Note 4:** No newspapers or electronic devices of any kind (Cell phone, MP3 player, IPod, etc) allowed during class time (i.e., during lectures, tests, etc).

• **Note 5:** **Cheating and plagiarism are serious offenses.** Our TA’s are trained to catch identical or similar reports even across different lab sections. Our graders will look particularly for signs of such violations.

**Offenders will be referred to the University’s Judicial Office.**
PHYSICS 273 Students Only

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

  A: 540 – 600 points
  B: 480 – 539 points
  C: 420 – 479 points  Total: 600 points
  D: 360 – 419 points
  F: 0 – 359 points
PHYSICS 252 Students Only

• **Grading scale:**

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

  A: 450 – 500 points
  B: 400 – 449 points
  C: 350 – 399 points  Total: 500 points
  D: 300 – 349 points
  F: 0 – 299 points
Course content

Chapters 21 through 31

- Part I – Electricity
- Part II – Magnetism
- Part III – Electromagnetism
- Part IV – AC circuits
• Part I - Electricity
• Electric Charges, Electrical Forces, and The Electric Field
  Polarization and Induction
  Coulomb's force law
  Electric fields and electric dipoles
  Motion of a charged particle in a uniform electric field
• Electric Potential Energy and the Electric Potential
  Electrical potential energy and the electric potential
  Electric potentials and electric fields
• Gauss's Law for the Electric Fileds
  The elegant application of Gauss's law
• Circuit Elements, Independent Voltage Sources, and Capacitors
  Terminology, notation and conventions
  Circuits elements
  An independent voltage source
  Connection of circuits elements
  Capacitors and dielectrics
• Electric Current, Resistance, and dc Circuit Analysis
  Electric current
  Resistance and ohm's law
  Characteristic curves
  Electric power
  Electrical Networks and Circuits
  Electronics
  Kirchhoff's laws
  Transients in circuits
• **Part II- Magnetism**

• **Magnetic Forces and the Magnetic Field**
  
  Magnetic field
  Magnetic forces on currents
  Work done by magnetic forces
  Torques
  Biot-Savart law
  Forces of parallel currents on each other and the definition of the Ampere
  Gauss's law for the magnetic field
  Magnetic poles and current loops
  Ampere's law
  Displacement current and the Ampere-Maxwell law
• **Part III - Electromagnetism**
  • **Faraday's Law of Electromagnetic Induction**
    Faraday's law of electromagnetic induction
    Lenz's law
    AC generators
    Maxwell equations of electromagnetism
    Electromagnetic waves
    Self inductance
    A series LR circuit
    A parallel LC circuit
    Mutual inductance

• **Part IV - AC circuits**
  • **Sinusoidal ac Circuit Analysis**
    The potential difference and current phasors for resistors, inductors, and capacitors
    Impedances
    Independent ac voltage sources
    Power absorbed by circuit elements in ac circuits
    A filter circuit
    A series RLC circuit
Very Important Notices

• This is a tentative Syllabus which is subject to change whenever needed or required. You will be informed in class if any modifications are warranted. **Grading Scheme will not change unless there’s a typo (also see next notice).**

• Syllabus and grading scheme are designed for students completing the full semester. Withdrawal grades would be calculated differently. Please consult with me before withdrawing.
NIU abides by Section 504 of the Rehabilitation Act of 1973 regarding provision of reasonable accommodations for students with documented disabilities. Moreover, your academic success is of importance to me. If you have a disability that may have a negative impact on your performance in this course and you may require some type of instructional and/or examination accommodation, please contact me early in the semester so that I can provide or facilitate in providing accommodations you may need. If you have not already done so, you will need to register with the Center for Access Ability Resources (CAAR), the designated office on campus to provide services and administer exams with accommodations for students with disabilities. CAAR is located on the 4th floor of the University Health Services building (753-1303). I look forward to talking with you to learn how I may be helpful in enhancing your academic success in this course.