Physics 273 Honors (Spring 2015) (4 Credit Hours*)
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 twice a week in FR 237: Tuesdays and Thursdays from 2:00 to 3:15 PM

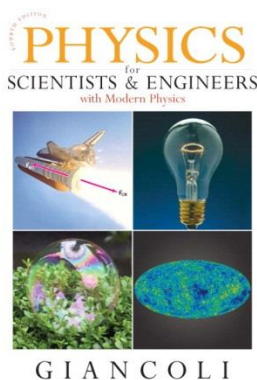**Office hours (FW 210) Subject to change:**
11:00 AM – 12:00 PM T, Th
01:00 PM – 01:50 PM T, Th
and by appointment, or anytime when I am in office and not too busy! Of course, I would let you know

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

- Homework: 5%
  Includes any type of HW assignments and participation. See notes for rules.
- Quizzes: 5%
  These could include pop quizzes, online quizzes, spot checks for attendance, etc.
- Tests (3):   45%
  First test includes 2 - 3 chapters. **Subsequent tests are cumulative.** Dates will be announced in class OR by email through blackboard.
- Lab: 20%
  (a minimum average lab grade of 60% is required. You will **fail** the course if your lab score is 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 <u>regardless</u> of your overall performance. **(Tuesday, <u>May 5, 2015: 2:00 - 3:50 PM</u>)**
- Extra Credit: Maybe!!! Usually in the form of a couple of bonus test questions – However, the number of bonus questions and their format could be anything I judge appropriate and necessary.

Notes

- **Note 1:**   HW deadlines are <u>**RIGID**</u>, no late HW will be accepted.
- **Note 2:**   Not all HW assignments would necessarily be graded.
  Likewise, <u>not all HW problems</u> would necessarily be graded.
- **Note 3:**   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 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, the missed test grade may be dropped. Do not assume that this is automatic. I have to see a convincing evidence that the emergency is real. I have seen before 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 5:**   Final exam may be rescheduled only in case of a well-documented and convincing emergency.
- **Note 6:**   No newspapers or electronic devices of any kind (Cell phone, MP3 player, IPod, 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 7:**   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 8:**   <u>**Cheating and plagiarism are serious offenses.**</u>
  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.
  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 – 92.99%
B⁺	87 – 89.99%
B	83 – 86.99%
B⁻	80 – 82.99%
C⁺	74 – 79.99%
C	70 – 73.99%
D	60 – 69.99%
F	0 – 59.99%

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

More 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 are typos (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.

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.*