

**P150 Honors SYLLABUS Fall 2016**  
**Section 01 Mon, Wed, Fri**

**COURSE:**               **Physics (Introductory)**  
**ALL course information will be posted on BlackBoard**

**TEXT/Materials:**    **(1) *Conceptual Physics, P.G. Hewitt*, 12<sup>th</sup> Edition (ISBN 0-321-05202-1)**  
**(2) Mastering Physics by Pearson for online homework**

**Course Description:** Development of concepts and principles from selected topics in mechanics, electricity, heat, sound, and light. Application to everyday life and contemporary issues facing society, and their implications. Topics may include energy sources, climate change, medical physics, among others. Not recommended for students who have had a year of high school physics. Not available for credit to students with credit in PHYS 150A.

**Requisites:** No pre- or co-requisites required.

**Credit hours:** 3 credits. Contact hours: 3.0. Lecture hours: 3.0.

**Method of delivery:** Traditional.

**Remark:** The combined four credits of this PHYS 150 (3 credits) and the new accompanied course PHYS 151 (1 credits) are equivalent to the old PHYS 150A course (4 credits).

**CLASS MEETINGS:**       Lecture Section 1: M, We, F 12:00 – 12:50 PM, La Tourette (FW) 200

**Instructor:**           George Coutrakon, Faraday Hall 218

**Office Hours:**       **Wednesdays and Fridays 1:00 – 2:00pm or by appointment**

**Email:**               [gcoutrakon@niu.edu](mailto:gcoutrakon@niu.edu)

***Note: Honors students will be required to do a special project – see me to discuss.***

**Course Goals:**

- Develop an understanding of basic scientific concepts, principles and laws of Physics.
- Develop critical thinking skills and a scientific approach to problem solving.
- Develop basic quantitative analysis skills and methods.

**Student Learning Outcomes:** Upon successful completion of the course,

- Students will be able to explain, analyze, and use basic, working knowledge of the physical concepts of force, motion, velocities, accelerations, and Newton's Laws.
- Students will be able to explain, analyze, and use basic physical concepts of work, energy and conservation of energy, and apply them to simple mechanical systems.
- Students will be able to explain, analyze, and use basic physical concepts of momentum and torque, and apply them to simple mechanical systems/phenomena.
- Students will be able to explain, analyze, and use basic physical concepts of the light waves and their various applications in everyday life.
- Students will be able to explain, analyze, and use basic physical concepts of 1<sup>st</sup> two laws of thermodynamics.

- Students will be able to explain, analyze, and use basic physical concepts of electricity and magnetism, and apply them to simple electrical and magnetic systems/phenomena.
- Students will be able to combine the above basic physical concepts and to apply to everyday life and contemporary complex issues facing society, and their implications, including energy sources, climate change and medical physics. Other topics includes wind turbines, copiers, hybrid vehicles, radios, audio amplifiers, electrical power plants, microwave ovens, lasers, DVDs, nuclear applications.

### **SCHEDULE OF EXAMS:**

TEST 1: **date TBA** : Chapters 2-7  
 TEST 2: **date TBA** : Chapters 15, 16, 18  
 TEST 3: **date TBA** : Chapters 22-26

**FINAL EXAM: date/time can be found on NIU website:** Location: LaTourette Hall, Rm 200

**GRADING:** Grading will be determined by the cumulative points for each student at the end of the semester. A histogram of all the students' cumulative points will be generated based on the weighting scheme shown below. Then the grades will be determined from a normal distribution fit to the curve, ie., a "bell" shaped curve. Normally, the center of the curve will be between a B and a C+ depending on the level of class effort exhibited by homework and test scores. The details will be explained when grades are posted. I will give an estimation of your grade at 8 to 9 weeks to allow you to assess where you are. Black Board keeps a weighted totals column that you can see through out the semester and I will announce periodically where you stand relative to the mean.

Three midterm exams	30%
Final Exam	20%
Online Homework	30%
Special Project	20%

**Extra credit (or debit) for attendance.** I will have a sign in sheet for attendance that you must fill in when you arrive in class. There will be a bonus credit at the end of the semester if you have attended more than 80% of the classes and an equal point loss of your weighted total if your attendance falls below 70%. Any cheating on attendance will be subject to penalties which can be as large as failing grade or withdrawal from the course. The amount of point loss or gain from attendance will be of the order of 1-3 percent of the weighted total and will be explained in class.

**\*MINIMUM REQUIREMENTS FOR a FINAL GRADE OF B- OR HIGHER.** Achieve an average of at least 50% on the 3 Tests and Final Exam

**NOTE: PHYS 150A (4 credits) has been replaced with a combination of this PHYS 150 (3 credits) and a new lab course PHYS 151 (1 credit).**

**Exams:**

There will be 3 midterm exams and the final exam is comprehensive. There will be **no** makeup tests unless you obtain written (email is fine) approval from me **PRIOR** to the exam. All exams will have multiple choice questions and answers. You will need to provide documentation for your absence if you are ill or have a family illness or death. I will ask you to bring in a note from Health Services or your Doctor. Similarly, a note from a university sports coach is required if there is an away game that you must attend.

**YOU MAY BE ASKED TO SHOW YOUR NIU PHOTO ID WHEN YOU TAKE EACH TEST. IF YOU DO NOT HAVE YOUR ID WITH YOU YOUR TEST WILL NOT BE GRADED**

**COURSE NOTEBOOK:** Students are strongly encouraged to keep a course notebook of notes of all lectures. Materials include (must be current): Syllabus, lecture notes (printed from Blackboard with room to take notes), student's class notes, tests, class exercises.

**HOMEWORK:** Completing the homework will improve your performance on the tests. Use Physics Help Room or my office hours if you need help. You can work with fellow students to solve HW problems which is an excellent way to learn. ALL HW assignments and due dates are in Pearson's Mastering Physics online system, which can be accessed via [www.masteringphysics.com](http://www.masteringphysics.com). See instructions below. Periodically, I will transfer grades from Mastering Physics to Black Board and you can check for accuracy. The homework system is included in the price of a NEW textbook, but will have to be paid for if a USED textbook is used.

**HOW TO ACCESS MASTERING PHYSICS ONLINE HOMEWORK ASSIGNMENTS.** You need 2 pieces of information to create an account on Pearson's Mastering Physics for online homework assignments First, the course name is Physics 150 for Poets, and second, the course ID is COUTRAKON150.

**WHAT TO BRING TO CLASS:** a notebook, text book, and calculator

**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](mailto:drc@niu.edu).

**COURSE POLICIES INCLUDE:**

1. Be respectful of each other (this applies to Instructors, TA's and students). Some specifics include:
  - a. No cell phone/ electronic device usage in class (except clickers, calculators). Cell/ smart phones must be turned off or silenced and placed in backpacks, etc. (not in pockets or on desks). Violators may be required to turn in their devices to the Instructor for the remainder of the class period.
  - b. Do not read books, newspapers, magazines, or journals during class.
  - c. No talking during class – raise your hand if have a question at any time.
  - d. Be on time to class. Students later than 15 minutes will not get credit for attendance that day.

- e. If you need to leave class early, let your instructor or TA know beforehand.
2. Laptops/ notebooks may be used for lecture materials and taking notes only, BUT students must sit in the first row of the lecture hall to use them.
3. Seat assignments will be used to facilitate in class group discussions.
4. Be aware of the policies and procedures regarding your rights as well as responsibilities that are published in the NIU Student Code of Conduct. It is available on line at [http://www.stuaff.niu.edu/judicial/24430jo\(body\).pdf](http://www.stuaff.niu.edu/judicial/24430jo(body).pdf) .
5. The instructor and the university reserve the right to modify, amend, or change the course syllabus (course requirements, grading policy, etc.) as the curriculum and/or program require.

## Course Schedule

The textbook (*Conceptual Physics*) is designed for a 2 semester course, so we will only be covering selected sections. The course is divided into 4 main sections.

1. Newton's Laws of motion plus concepts of force, work, momentum, energy, and power
2. Temperature, heat, and and the laws of thermodynamics
3. Electricity, magnetism, light waves and electricity generators
4. Structure of matter, i.e., atoms and nuclei, nuclear energy for electricity generators.

Weeks 1 through 4 – Classical Mechanics

Chapter 2 through 5. Newton's three laws of motion

Chapter 6 and 7. Momentum, work, energy, and power

Exam #1

Weeks 5-6 -- Temperature, heat, and first 2 laws of thermodynamics

Chapters 15, 16 and 18

Exam #2

Weeks 7-9 -- Electricity, magnetism, light waves, radio waves, microwaves, and electricity generation

Chapters 22-26

Exam #3

Week 10 – Chapter 30 – Light emission from sun, tungsten bulbs, lasers and LEDs

Week 11- 13 – Chapters 33 and 34 – Theory of the atom, nuclear energy, and electrical power generation

Week 14 – Thanksgiving week, 1 day of class, Nov. 21.

Week 15 – Review of material of weeks 1 through 9

Week 16 – Final Exam Week

