The goal of this course is to increase your scientific literacy, and to introduce you to the basic concepts of physics. After covering core concepts, we will discuss topics of current interest – energy, global warming, life elsewhere in the universe, pseudoscience, nuclear energy, nuclear terrorism, and alternatives to fossil and other nonrenewable fuels.

There will be three tests during the semester, a final exam, and in-class quizzes and other exercises. Each test will be worth 100 points, and the in-class quizzes and exercises will total to another 150-200 points. Homework will count for extra credit. Other extra credit opportunities will be announced during the semester.

Grade scale (calculated on total score at the end of the semester):

- 85 – 100%: A
- 75 – 85%: B
- 60 – 75%: C
- 40 – 60% D
- 0 – 40%: F

IF YOU ARE TAKING THE LAB (150A): The above applies to the 3-hour lecture portion of the class, which will count for 75% of your total grade. The other 25% will be the lab. NOTE: YOU MUST PASS THE LAB IN ORDER TO PASS THE COURSE.

Week of Jan. 12: Chp. 1.1 (An invitation to science); Chp. 2.1 - 2.4 (Atoms; metric distances and powers of 10)

Week of Jan. 19: Chp. 2.5 - 2.8 (Atoms); Chp. 3.1 - 3.4 (Law of inertia; speed and velocity)

Week of Jan. 26: Chp. 3.5 (Acceleration), Chp. 4.1 - 4.4 (Force, weight); Chp. 5.1 - 5.2, review (law of gravity)

Week of Feb. 2: TUES. 2/3 TEST ON PARTS 1 AND 2
Chp. 6.1 - 6.4 (Work; energy)
Week of Feb. 9: Chp. 6.5 - 6.7 (Energy transformations; power); Chp. 7.1 - 7.3 (Thermal energy; heat engines)

Week of Feb. 16: Chp. 7.5 - 7.8 (Transportation efficiency; power plants; resource use); Chp. 8.1 - 8.4 (Waves; light; electricity)

Week of Feb. 23: Chp. 8.5 - 8.8 (Magnetism; atom; force fields); Chp. 9.1 - 9.4 (electromagnetic waves; solar radiation)

Week of Mar. 2: Chp. 9.5 - 9.6 (Ozone depletion; global warming), review
THURS. 3/5 TEST ON PART 3

Week of Mar. 16: Chp. 12.1 – 12.6 (Other places for life in the universe; how likely is it that there is life elsewhere?)

Week of Mar. 23: Chp. 12.7, review (Pseudoscience)
THURS. 3/26 TEST ON PART 4

Week of Mar. 30: Chp. 15.1- 15.7 (Nuclear energy; radioactive decay; half-life; radioactive dating; radiation exposure; risks)

Week of Apr. 6: Chp. 16.1 – 16.7 (Fusion, fission; chain reaction; fission and fusion weapons)

Week of Apr. 13: Chp. 16.8 (Nuclear terrorism)

Week of Apr. 20: Chp. 17.1 - 17.7 (Energy use; nuclear power; Future energy options)

Week of Apr. 27: Honors presentations; review. There WILL be questions from the honors presentations on the final.

FINAL EXAM: TUESDAY MAY 5, 2:00 – 3:50
Policies and Procedures

1. Honors students: You will be required to do an honors project. Please see me before Feb. 6th to choose a topic.

2. Part of your grade will depend on in-class activities. If you must miss class, please contact me ahead of time to arrange a substitute assignment. If you know ahead of time that you must miss an exam, please see me at least a week before the exam.

3. In case an emergency causes you to miss class or an exam, please contact me as soon as possible thereafter so I can accommodate you.

4. Please respect me and the other students during class – turn off cell phones and pagers, and refrain from conversation or other disruptive activities. Students who are continually disruptive may be asked to leave class.

5. Please make every effort to be on time. If you must be late, please find a seat quietly. DO NOT walk up to the front of the room and turn in homework, or whatever, if class has already started – wait until the end.

6. Likewise, if you know you will be leaving early, please sit near the back to minimize disruption to other students.

7. Cheating will not be tolerated, and will be dealt with according to the NIU Student Code of Conduct.
Instructional Objectives

By the end of this course, you should be able to:

- Describe in words: position, speed, velocity, acceleration, force, mass, weight, gravity, work, energy, power, the electromagnetic spectrum, nuclear fusion, nuclear fission
- Explain in simple terms the basic atomic structure of matter
- Explain in simple terms the second law of thermodynamics and the limitations it places on efficiency
- Briefly describe the science behind ozone depletion, global warming, dangers of ionizing radiation, renewable and nonrenewable resources, energy generation, use, and conservation; discuss societal impact of each
- Explain the difference between science and pseudoscience, and be able to tell them apart
- Discuss the possibilities for life elsewhere in the universe
- Describe the basic operation of nuclear power plants, fission and fusion weapons, and the likely scenarios for nuclear terrorism
Physics 150, Spring 2008
Assignment Schedule

Reading should be done before class.
Homework is due on the first class of the week following, and may be turned in on paper, emailed to swillis@niu.edu, or placed in the Blackboard digital dropbox. Each homework assignment turned in on the day it is due will receive 5 extra credit points. No credit for late homework.

Week of Jan. 12: Read Chp.1.1, 2.1-2.4
Homework due Jan. 20: Chp. 2 Exercises 5, 7, 12, 16, 17, 23, 26, 31

Week of Jan. 19: Read Chp. 2.5- 2.8, 3.1 – 3.4
Homework due Jan. 27: Chp. 2 Exercises 34, 36, 38, 42, 44, 45;
Chp. 3 Exercises 1, 3, 7, 8, 10, 12, 15

Week of Jan. 26: Read Chp. 3.5, 4.1- 4.4, 5.1 – 5.2
Homework due Feb. 3: Chp. 3 Exercises 16, 18, 19;
Chp. 4 Exercises 1, 6, 8, 10, 13, 17
Chp. 5 Exercises 1, 2, 8, 9, 13, 20, 22, 31, 32, 33

Week of Feb. 2: TUES. 2/3 TEST ON PARTS 1 AND 2
Read Chp. 6.1 – 6.4
Homework due Feb. 10: Chp. 6 Exercises 1, 3, 8, 11, 16

Week of Feb. 9: Read Chp. 6.5 – 6.7, 7.1 – 7.3
Homework due Feb. 17: Chp. 6 Exercises 26, 28, 30, 34, 36, 38, 41, 46, 47
Chp. 7 Exercises 2, 4, 6, 7, 9, 13

Week of Feb. 16: Read Chp. 7.5 - 7.8, 8.1 – 8.4
Homework due Feb. 24: Chp. 7 Exercises 25, 29, 31, 36, 37, 41, 43
Chp. 8 Exercises 1, 3, 5, 8, 10, 12, 13, 14, 19

Week of Feb. 23: Read Chp. 8.5 - 8.8, 9.1 – 9.4
Homework due Mar. 3: Chp. 8 Exercises 23, 29, 32, 36, 38
Chp. 9 Exercises 2, 4, 11, 14
Week of Mar. 2: Read Chp. 9.5 - 9.6
Homework due Mar. 17: Chp. 9 Exercises 17, 21, 23, 26, 29, 33
THURS. 3/5 TEST ON PART 3

Week of Mar. 16: Read Chp. 12.1- 12.6
Homework due Mar. 24: Chp. 12 Exercises 1, 3, 5, 6, 9, 11, 17, 19, 21

Week of Mar. 23: Read Chp. 12.7
Homework due Mar. 31: Chp. 12 Exercises 23, 26
THURS. 3/26 TEST ON PART 4

Week of Mar. 30: Read Chp. 15.1 – 15.7
Homework due Apr. 7: Chp. 15 Exercises 1, 2, 5, 6, 10, 13, 16, 18, 19, 27, 28, 31, 32, 38, 39, 41, 44

Week of Apr. 6: Read Chp. 16.1 – 16.7
Homework due Apr. 14: Chp. 16 Exercises 2, 4, 5, 6, 10, 14, 15, 17, 19, 24, 26, 27, 29

Week of Apr. 13: Read Chp. 16.8
Homework due Apr. 21: Chp. 16 Exercise 33

Week of Apr. 20: Read Chp. 17.1 - 17.7
Homework due Apr. 28: Chp. 17 Exercises 2, 8, 16, 19, 22, 25, 29, 30, 31, 33, 36, 39, 41, 43, 45, 46

FINAL EXAM: TUESDAY MAY 5, 2:00 – 3:50