

Physics 150 SYLLABUS Fall 2018

Class Schedule: Mon., Wed., Fri. 11:00 – 11:50 AM, La Tourette (FW) 200
Instructor: George Coutrakon,
Office Location: Faraday Hall 218
Office Hours: **Monday and Wednesday: 1:00 – 2:00pm or by appointment**
Email: gcoutrakon@niu.edu

Course information will be posted on Black Board including, weekly topics and reading assignments, graded assignments and test results. We will use online homework assignments, i.e., Pearson's Mastering Physics.

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

Home Work Website: ALL HW assignments and due dates are in Pearson's Mastering Physics online system, which can be accessed via www.masteringphysics.com. You need two pieces of information and an access code to create an account on Pearson's Mastering Physics. First, the course title is “**Physics 150 for Poets Fall 2018 Coutrakon**” and the course ID is “**PHYSICS150Fall2018**”. It is important that you set up your account as soon as possible. The first assignment is due 10 or 11 days after the first class. Due dates are posted on the Mastering Physics website. If you believe you have not been given credit for a correct answer, come see me and I can make an adjustment. 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 separately if a used textbook is purchased. I will give you an estimate of your grade during the 8th week of class with an Announcement on Black Board.

Electronic devices: All electronic devices must be off during the lectures. If you want to use your computer for access to the text book during lectures, you must sit in the middle of the first or second row.

Course Description: Development of concepts and principles from selected topics in mechanics, electricity, magnetism, heat, sound, and light. Application to everyday life and contemporary issues facing society, and their implications. Topics include electrical energy sources and climate change. Not recommended for students who have had a year of high school physics.

Requisites: No pre- or co-requisites required.

Credit hours: 3 credits.

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).

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 1st 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.

Course Schedule of Subject Matter

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 the laws of thermodynamics
3. Sound waves and musical instruments
4. Electricity, magnetism, light waves and electricity generators

1st section - Weeks 1 through 6 – Classical Mechanics

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

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

Exam #1 - 4th week of September

2nd Section - Weeks 7 - 9 -- Temperature, heat, and first 2 laws of thermodynamics

Chapters 15, 16 and 18

Exam #2 - 3rd week of October

3rd Section - Weeks 10-11 Sound waves and Musical instruments

Chapters 19-21

4th Section Weeks 12-14 -- Electricity, magnetism, light waves, radio waves, microwaves, and electricity generation

Chapters 22-26

Exam #3 Monday before Thanksgiving

Week 15 – Review of material of weeks 1 through 10

Week 16 – Final Exam Week

SCHEDULE OF EXAMS:

TEST 1: **date TBA** : Chapters 2-7 -- Mechanics

TEST 2: **date TBA** : Chapters 15, 16, 18 Heat, Temperature and Work

TEST 3: : Chapters 19 - 21 (Sound waves and Music) and parts of Chapters 22-24

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 throughout the semester and I will announce periodically where you stand relative to the mean.

Three midterm exams 30%

Final Exam 20%

Online Homework 50%

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 1-2 percent of the weighted total as described 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. If you will be taking the exams through the DRC, you must see me in the first or second week and bring all paperwork for me to sign at least 1 week before each exam. If you are absent due to to scheduled NIU team sporting events, see me for make up exams.

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 for all lectures.

HOMEWORK SUGGESTIONS: Completing the homework will improve your performance on the tests. Use Physics Help Room (Faraday Hall Rm 251) or my office hours (Faraday Hall Rm 218) if you need help. You can work with fellow students to solve HW problems which is an excellent way to learn, but you need to try to solve them yourself first.

WHAT TO BRING TO CLASS: Bring a notebook, text book and calculator are optional , but can be helpful.

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.

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).
 - 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

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6. Temperature, heat, and the laws of thermodynamics
7. Sound waves and musical instruments
8. Electricity, magnetism, light waves and electricity generators

1st section - Weeks 1 through 6 – Classical Mechanics

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

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

Exam #1 - 4th week of September

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Chapters 15, 16 and 18

Exam #2 - 3rd week of October

3rd Section - Weeks 10-11 Sound and Musical instruments

Chapters 19-21

4th Section Weeks 12-14 -- Electricity, magnetism, light waves, radio waves, microwaves, and electricity generation

Chapters 22-26

Exam #3 Monday Nov. 20

Week 15 – Review of material of weeks 1 through 10

Week 16 – Final Exam Week