

Physics 150 Online Syllabus Fall 2020

Instructor: George Coutrakon,
Office Location: Faraday Hall 218
Office Hours: Only by request
Online Office Hours Using Black Board Collaborate which I will initiate on Mondays at 12 to 1pm
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Class Schedule: This is an online course. We will have online discussions on Black Board Collaborate each Monday at 12 to 1pm. Lecture videos are mandatory and available in “Weekly Materials” on Black Board. Homework (HW) deadlines are available on the Mastering Physics Website. HW due dates are either Tuesdays and/or Fridays at 11:59 pm. There are 3 midterm exams which will be administered online at the times listed below. The final exam will be during finals week at the time scheduled by the university for classes normally meeting on Mon.Wed.Fri. 12-12:50

Course information will be posted on Black Board including weekly recorded lectures and reading assignments, graded homework (HW) scores and test results. We will use online HW assignments, i.e., Pearson’s Mastering Physics. The schedule for due dates for each chapter will be posted there. All homework (HW) will be due on Tuesdays or Fridays at 11:59 pm. Late HW will not be accepted.

TEXT/Materials: (1) *Conceptual Physics, P.G. Hewitt , 12th Edition*
(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 Online Fall 2020 Coutrakon**” and the course ID is “**coutrakon97285**” . It is important that you set up your account as soon as possible. The first assignment is due 8 or 9 days after the start of the semester. Due dates are posted on the Mastering Physics website. If you believe you have not been given credit for a correct answer, contact 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: Use of computers is required for most aspects of the course including exams. Exams will be open note, open book. You are on the honor system not to use outside help for exams including websites such as chegg.org .

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

Requisites: No pre- or co-requisites required.

Credit hours: 3 credits.

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 and 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 - Week 1 through 4 – Chapters 2-7, Classical Mechanics

Newton's three laws of motion. momentum, impulse, work, energy, and power
Conservation laws of momentum and energy

Exam #1 – 4th Wednesday of September, Sept. 23 , 12- 12:50 pm

2nd Section - Weeks 7 - 9 -- Temperature, heat, and the 3 Laws of Thermodynamics
Chapters 15, 16 and 18

Exam #2 - 4th Wednesday of October, Oct.28, 12-12:50pm

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

Chapters 19-21

4th Section Weeks 12-15 -- Electricity, magnetism, light waves, radio waves, microwaves, and electricity generation

Chapters 22-26

Exam #3 – Monday Nov. 30, 12-12:50pm

Week 16 – Final Exam Week is Dec. 7-11, See university final exam schedule for classes normally meeting Mon. Wed. Fri. 12-12:50pm

EXAMS:

12-12:50pm (except Final Exam). All exams are equally weighted multiple choice problems. Calculators are needed for exams.

TEST 1: Chapters 2,3,4 and 5

TEST 2: Chapters 6-7, 15,18 Heat, Temperature and first 2 Laws of Thermodynamics

TEST 3: Chapters 16, 19, 20 Heat Transfer, Black Body radiation, Sound waves and Music

Final Exam: Date and time on NIU Website.

GRADING: Grading will be determined by the cumulative Weighted Total in Black Board for each student at the end of the semester. A histogram of all the students' cumulative Weighted Totals 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 is often 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%

***MINIMUM REQUIREMENTS FOR A FINAL GRADE OF B- OR HIGHER.** Student must achieve an average of at least 50% on the 3 midterm tests and Final Exam and at least 38% to qualify for a C or higher.

NOTE: PHYS 151 may be required for some of you depending on your major. Details of how this course will be done using online resources will be announced.

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. There will be no make up exams for the final 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 email me 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 during my office hours (Tuesdays or Thursdays) 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 or ROTC event, see me for make up exams.

COURSE NOTEBOOK: Students are strongly encouraged to keep a course notebook for all lectures and reading assignments.

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

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. All exams will be proctored to insure compliance with testing rules. Students must sit have at least one empty seat on each side of them for the exams.
2. 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) .
3. The instructor reserves the right to modify, amend, or change the course syllabus (course requirements, grading policy, etc.) as the curriculum and/or program require.