PHYS 150 SYLLABUS Spring 2017 (version 1b)

Section 01 Mon, Wed, Fri noon-12:50 LaT 200

NIU Catalog Description	PHYS 150 Physics (Introductory) (3 credits) 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.
NIU General Education	Phys 150 (3 unit lecture) and 151 (1 unit lab) is approved to satisfy Nature and Technology general ed course credit at NIU. It is not, however, part of any of the new General Education Pathway sequences. "Courses in Nature and Technology will develop students' understanding of the role of science, technology, engineering, and mathematics and their relevance to societal issues. This domain encompasses human activities through which we observe, measure, model, and interpret the natural world and physical universe. Courses will explore the process of scientific discovery and how the resulting knowledge is applied to understand technological and societal change. Students will: (1) be able to articulate society's connections to, and responsibility towards, the natural world; and (2) learn to apply the scientific method, including assessing empirical data, investigating the predictions of existing theories, and developing experimentally testable hypotheses."
IAI equivalent	**IAI P1900(L) : General Education Physics (3-5 semester credits)** A course that examines the concepts and methods of physics, with topics selected from mechanics, fluids, heat, electricity and magnetism, optics, waves and modern physics. (L = plus laboratory = PHYS 150 + PHYS 151 at NIU)
Delivery method and other remarks	All lecture sections are traditional (Face-to-Face); 3 contact hours per week. All lab sections are traditional (Face-to-Face) with majority of lab activities hands-on; Lab meets for 2 contact hours per week. The combined Lecture PHYS 150 (3 credits) and Lab PHYS 151 (1 credit) are equivalent to the combined course formerly known as PHYS 150A (4 credits). Note – Some students will only take Phys 150 (Lecture). Some majors require both the Lecture and the Laboratory! Check with your major advisor.
Text and Materials	**(1)** *Conceptual Physics, P.G. Hewitt* , 12th Edition (ISBN 0-321-05202-1) **(2)** Mastering Physics by Pearson for online homework (required – this can be bought separately if desired) The Hewitt textbook (*Conceptual Physics)* is designed for a 2 semester course, so we will only be covering selected sections.
CLASS MEETINGS: **Class times and instructor contact information**	**Lecture Sect 001**: M, W, F: 12:00 – 12:50 PM, La Tourette (FW) 200 **Instructor:** Carol Thompson; LaTourette Hall 207; 815-753-1772 **Office Hours:** 3:30-5:30pm and by appointment! **Email: cthompson@niu.edu** **Phys 151 Labs: 000A (7076) 9-10:50; 000B (7077) 13-14:50; FR 235** **Lab TA:** Marc Pavlik, Z1726445@students.niu.edu,
Physics Help Room Hours	Faraday Hall 251 – Monday to Thursday 9-4pm, Friday 9-3pm

Accessing "Pearson's Mastering Physics" Online Assignments

Two pieces of information are needed to create an account on **Pearson's Mastering Physics** for online homework assignments.

Course Title: PHYS 150 NIU Spring2018 Thompson

Course ID: PHYS150NIUSPRING2018THOMPSON

Your student ID you create should be your Zid (with the Z, e.g., z1234567)

(if you already have Pearson ID, you can use it, make sure I can identify you, however!)

A 'sample' assignment is up and must be completed the first week (it tests whether everything is working for you). You MUST complete it so that we can check the roster, and fix any problems with your account or your access. (I have no sympathy for complaints later in semester that should have been caught during this 'shake-down' practice assignment. You can be 'silly' in answering these 'sample' questions but do not be silly in using it as a serious 'shake-down' testing)

Periodically, the grades from Mastering Physics will be transferred to Blackboard. Please check for accuracy in the transfer. The homework system is included in the price of a NEW textbook, but must be purchased separately if a used textbook is used.

Note: Late homework will have 14% of the points deducted for each day past the deadline. (That is, homework 1 week late will automatically count for 0 points)

Grading

Final grade in class is calculated like a 'GPA' using the weightings as follows. Each of the 6 items will get a letter grade (A=4, B=3, C=2, D=1, F=0)

Exam ONE, TWO, THREE	10%: 10% : 10% (30% total)
1 final exam (cumulative)	30%
In-class quizzes/activities	15%
Homework	25%

Each exam will receive a letter grade which will be used in final grade calculation.

In-class quizzes/activities and homework receive points per problem. At end of semester, the letter grade for the homework and for the in-class quizzes is determined according to percentages points acquired with respect to total possible points.

>80%	>70%	>60%	> 50%	<50%
A	B	C	D	F

Non-Attendance penalty: Students who complete the in-class quizzes/exams/activities receive attendance credit for those days. In addition, attendance will be sampled on other days, such as via an occasional roll call or sign-in sheets. At the end of the semester, if a student is missing a fraction of the lectures where attendance credit was measured, the following penalties apply to the final Grade calculation:
85-100% attendance = Yea!
75-85% attendance penalty = "– 0.10" ← this student missed more than 6 days!
70-75% attendance penalty = "– 0.30" ← this student missed 11 days or more!
zero-69% attendance penalty = "– 0.60" ← this student missed whopping 13 days or more!

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 MAY NOT BE GRADED.

Example of How Grading Works

Just like calculating any 'GPA': A=4; B=3; C=2; D=1; F=0

ID	EXAM 1	EXAM 2	EXAM 3	FINAL	HW	QUIZ/ INCLASS	'GPA'	ATTENDANCE PENALTY	'GPA' (after penalty)	LETTER GRADE for COURSE
Mary	C	B	A	B	B	C	2.75	**-0.30**	2.45	C+
Alice	C	B	A	B	B	C	2.75	0	2.75	B –
Sara	C	B	A	B	A	A	3.40	0	3.40	B+

$$0.1\times EX\,1+0.1\times EX\,2+0.1\times EXAM\,3+0.30\times FINAL+0.25\times HW+0.15\times QUIZ=GPA$$

'GPA' Score calculated above is assigned to final letter course grade as follows: 3.85 (A), 3.51 (A-), 3.18 (B+), 2.85 (B), 2.51 (B-), 2.18 (C+), 1.75 (C), 0.75 (D), <0.75 (F).

In the example:
Mary missed at least 11 classes out of the semester (Attendance <79%)
Sara and Alice missed less than 3 classes out of the entire semester.

Learning Outcomes	explain and use the physical concepts of force, motion, velocities, accelerations, and Newton's Laws.
	analyze basic physical concepts of work, energy and conservation of energy, and momentum as applied to simple mechanical systems.
	explain basic physical concepts of the light waves and demonstrate their applications in everyday life
	explain basic physical concepts of 1st two laws of thermodynamics.
	explain basic physical concepts of electricity and magnetism, and apply them to simple electrical and magnetic systems/phenomena.
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

Topical Outline Phys 150(Lecture) and Phys 151(Lab) v1b (2018-1217)

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

WEEK #	**Phys 150 Lecture Topics**	NOTES – Three In class exams are on Wednesday	(**Phys 151 Laboratory** scheduled for 2 contact hours/week) 10 Hands-on Laboratory Modules (#1, ...) 2 Supporting Laboratory Modules (#A, #B) 2 Laboratory Enrichment Modules (#α, #β)
Week 1	**Chapter 2 through 5.** Newton's three laws of motion		**MLK Holiday (Monday)**
Week 2	**Chapter 2 through 5.** Newton's three laws of motion		**Activity #A Orientation & Graphing, problem solving** **Assessment pre-Testing (Force Inventory Concepts)**
Week 3	**Chapter 6 and 7.** Momentum, work, energy, and power		**Lab #1** **Motion & Push / Pull Forces**
Week 4	**Chapter 6 and 7.** Momentum, work, energy, and power		**Activity #B** **Lab report writing orientation (Lab #1 used to demonstrate)**
Week 5	**Chapters 15, 16 and 18.** Temperature, heat, and first two laws of thermodynamics	Exam ONE	**Lab #2** **Velocity, Acceleration, 2d Motion**
Week 6	**Chapters 15, 16 and 18.** Temperature, heat, and first two laws of thermodynamics		**Lab #3** **Newton's 3rd Law**
Week 7	**Chapters 22-24.** Electrostatics, Currents, Circuits and Ohm's Law, Magnetism		**Lab #4** **Friction**
Week 8	**Chapters 22-24.** Electrostatics, Currents, Circuits and Ohm's Law, Magnetism	Exam TWO	**Lab #5** **Specific Heat**
Week 9	SPRING BREAK March 12- 16, 2018		**SPRING BREAK**
Week 10	**Chapters 22-24.** Electrostatics, Currents, Circuits and Ohm's Law, Magnetism		**Lab #6** **Static Electricity / Coulomb's Law**
Week 11	**Chapter 26,28-29.** light waves, radio waves, microwaves, Properties of light, reflection and refraction, light waves		**Lab #7** **Ohm's Law**
Week 12	**Chapter 26,28-29.** Properties of light, reflection and refraction, light waves		**Lab #8** **Simple Harmonic Motion (springs) & Energy**
Week 13	**Chapter 30.** Light emission from sun, tungsten bulbs, lasers and LEDs		**Lab #9** **Reflection, Refraction, Dispersion**
Week 14	**Chapters 33 and 34.** Theory of the atom, nuclear energy, and electrical power generation	Exam THREE	**Lab #10** **[TBD]**
Week 15	**Chapters 33 and 34.** Theory of the atom, nuclear energy, and electrical power generation		**Lab #11 or Lab Activity** **[TBD]**
Week 16	**Chapters 33 and 34 and Review of all material**		**Activity – Q and A with Graduate students presenting on their research and how their experimental skills were acquired!** **(also - Assessment post-Testing (Force Inventory Concepts)**
Finals Week	Phys 150 Final takes place on date/time established by University (see Finals Schedule NIU).	Monday May 7, 2018; noon-1:50pm LaT 200	No labs meet during Finals week

COURSE POLICIES INCLUDE:

1. Be respectful of each other (this applies to Instructors, TA's and students). Some specifics include:
    a. Cell/ smart phones must be turned off or silenced and placed in backpacks, etc. (not on desks).
    b. When requested, electronic devices should be stowed in backpack/bag (typically this will be required for quizzes, etc). Violators may be required to turn in their devices to the Instructor for the remainder of the class period.
    c. Minimal extraneous chatter during class – raise your hand if you have a question at any time. We are happy if you are curious and interested in discussing topics at greater length, but avoid chattering with neighbor with comments and questions.
    d. Be on time to class.
    e. It is respectful and professional to inform your instructor or TA when other commitments or issues will require you to leave early/arrive late/miss class even if not requesting a special accommodation.
2. Laptops/notebooks/tablets may be used for lecture materials and taking notes.
3. Seat assignments may be used to facilitate in class group discussions or to separate distracting chattering buddies.
4. Completing the homework will improve retention of concepts and promotes learning Use Physics Help Room or my office hours if you need help. Work with fellow students to discuss and solve HW problems. It is an excellent way to learn. ALL HW assignments and due dates will be in Pearson's Mastering Physics online system, which can be accessed via www.masteringphysics.com.
5. Be aware of the policies and procedures regarding student 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 .
6. 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.
7. 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*.
8. Absences (the normal nuisance stuff): While it is only polite and professional to inform the instructor that you will be absent for class, typically there will be no 'excused' absences granted except in extraordinary circumstances. Missing 1 to 2 classes every 2 to 3 weeks (85%) is not a difficult minimum attendance goal to require. It is considered more than enough wiggle room to accommodate the occasional needs of balancing family or professional responsibilities, and the occasional minor illness or temporary transportation mishap or other 'oops' (flat tire, ran out of gas). Yes there is a steep penalty built into the grading scheme for habitual absenteeism.
9. Absences (exams/finals) When an on-going situation or illness causes student to miss one of the three exams or final, and a decision needs to be made whether to allow a

makeup exam, this situation should be discussed with instructor in ADVANCE or AS SOON AS PRACTICAL. This will usually requires a doctors note, etc.

10. Absences (The bad stuff that can happen unexpectedly): For an event that knocks the stuffing out of a student during the semester (for example; death in immediate family, sudden change in health of child/parent/sibling/significant other for whom they are primary caregiver, an emotional/physical traumatizing event, or serious health issue arising) please contact instructor (ASAP) so we can figure out the best way to accommodate the situation. Don't tough it out and don't ghost the course. We are not heartless! I am not interested in discussing private personal details of a situation, but I will need enough information so we can figure out together how best to accommodate special needs and create a timeline and plan for particular exceptions or exemptions for the student.