Syllabus – PHYS 1010

Course Information
PHYS 1010 – Elementary Physics: The Way Things Work
Fall Semester 2016; Section number: 001; Class number: 1462; Credits/Units: 3
Mondays, Wednesdays, and Fridays at 11:50 a.m. - 12:40 p.m.
James Fletcher Building (JFB) 101
Department of Physics and Astronomy:  http://www.physics.utah.edu
Important Academic Dates:  http://registrar.utah.edu/academic-calendars/index.php

Instructor Information
Adam J. Beehler; beehler@physics.utah.edu; JFB B8; 801-581-6602
office hours:  by appointment (just contact me and we will find a time)
Teaching Assistant (TA) information will be posted on WebAssign.

Required Text
Conceptual Physics; eleventh edition by Paul G. Hewitt
published by Addison-Wesley
Here is a link to it on Amazon.com.
I like this text a lot, but I chose it because I think you will like it a lot, too! I will use it
constantly and I expect you too as well. It is your friend.

Prerequisite
I will assume that you have not had a previous physics course, but that you do have a mathematics
background at the level of basic algebra. You will be expected to use some algebra to solve the physical
problems.

Course Description
from General Catalog:  http://www.acs.utah.edu/GenCatalog/deptdesc/phys.html
• Conceptual Physics course which satisfies a General Education requirement for majors outside the science
and engineering disciplines. The primary objective is to provide a solid foundation in physics principles,
focusing on fundamental concepts and logic rather than numerical problem solving. Connections between
abstract concepts and familiar objects or phenomena help students develop their physical intuition and
demonstrate that the universe is predictable rather than magical.
• This course meets the Intellectual Explorations – Physical and Life Sciences (SF) requirement. This
course also addresses the following Essential Learning Outcomes: Inquiry and Analysis, Critical
Thinking, Problem Solving, Foundations and Skills for Lifelong Learning.

Course Content
How does it work? This question is the essence of science, whether it is applied to an atom, to a solar
system, to a DVD player, or to a cell phone. Chances are, when you were a small child, you asked this
question of your parents about basically everything you saw, heard, or otherwise experienced in the new and
exciting world that was unfolding before you. Your decision to enroll in this course is ample evidence that
you are still asking the question, “How does it work?” even if you have trouble finding the answer. This
class is ultimately about learning how to find that answer for yourself by developing an understanding of the
basic physical principles that underlie the world around us. I would like you to learn how to critically think
and apply general physical laws to specific phenomena. This typically requires thinking in a different way.
You will need to spend time outside of class contemplating this stuff because simply regurgitating
information back on assignments and exams will not work. You will be expected to reason and apply this
knowledge. Demonstrations of many of the phenomena will be performed in class. Physical and conceptual understanding will be emphasized rather than memorization.

Class Time
A lot of the class time will be occupied with demonstrations and class discussion. Come to class! You will hear and see things in class that you will not find in the text. Much of your conceptual understanding may be acquired during the lecture periods, and I reserve the right to test you on material that has only been encountered during class! I also strongly encourage you to come to class prepared by reading the relevant material beforehand. If you find that you are not understanding this stuff as well as you would like, I promise you will improve by reading it before I discuss it. I reserve the right to quiz you to see how prepared the class is.

Class Participation
Everything works better when there is good communication between individuals, so I will do my part at making folks feel comfortable during class time. This class is for you – not me. If you are not proactive about it, then I cannot help you. Help me help you. Commit to answers when I ask questions. Usually I am just probing and do not expect folks to actually know the correct answers yet. It is all right to be wrong, but it is not all right to never even try or guess.

Instructor and Student Responsibilities
All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. Faculty must strive in the classroom to maintain a climate conducive to thinking and learning. Students have a right to support and assistance from the University in maintaining a climate conducive to thinking and learning.

Cheating
Cheating will not be tolerated. I encourage you to study together and ask each other questions about homework and anything else you are having problems with, but do not copy directly from other people’s homework, tests, websites, etc. If you need clarification on what exactly cheating is, then please come and see me. If you are caught cheating…

1. for the first offense, you will receive a zero on the assignment
2. for the second offense, you will be dropped a letter grade at the end of the semester
3. for the third offense, you will fail the course and receive university disciplinary action

Students Needing Special Accommodations
Americans with Disabilities Act Statement: The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services (CDS), 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.
Clickers
I will be using the university-chosen Audience Response System to monitor and interact with you. You will need to use a personal response device. This can be a "clicker;" OR for those with mobile devices (that can connect to the internet), ResponseWare can be another option instead of personal response clickers. If you do not participate, then you will miss a vital stage of learning. Not only that, but you will lose points. I reward one point for incorrect answers and 1.5 points for correct answers.

Registration
Watch the short video explaining the registration process. It is posted under the “Resources” section of our WebAssign course (StudentClickerRegistration.mp4). Please follow the instructions carefully to participate. The process is briefly outlined here:

• From within Canvas, choose Modules, and follow the Clicker Registration Tool to create a Turning Account (then check email, click verification link, and enter profile information).
• From the Student Store, add (or purchase) a License (which includes a ResponseWare license). Our school code is JO2S, if needed (letter O, not the number zero).
• IF using a clicker, add (or purchase) one. (A ResponseWare Device ID is automatically added.)

This registration integrates your device with your name and university ID number (u0xxxxxx) so that I can correctly assign points earned. You must also complete the following steps to allow the integration process to work properly:

• Verify in Canvas that your name is accurate. Under "Settings" (upper right hand portion of webpage), you should see your "Full Name," your "Display Name," and your "Sortable Name." Mine look like this, Full Name: Adam Beehler, Display Name: Adam Beehler, and Sortable Name: Beehler, Adam.
• Clear any user-entered information from your clicker or from your ResponseWare software (such as a mobile device app).

Class Usage
• Clicker: make sure your device is on the same channel as the instructor (The instructor will inform you of which channel to use.)
• ResponseWare: through a web browser or your mobile device app, log in with the instructor provided session ID number for that lecture (it will be a different number each time). I will give you the session ID number during class right before we use the devices. The university strongly suggests that you connect to the internet through the UConnect network to avoid being disconnected unexpectedly. Attempting to use your cell network or the UGuest network seems to be about 50% reliable with ResponseWare.
• When a response has been successfully submitted, you should see a smiley face or a checkmark as confirmation.
Homework

WebAssign Utah Login:  https://www.webassign.net/utah/login.html

We will retain one famous aspect of the traditional physics course: frequent homework assignments. The essence of understanding is in the application of learned principles to new situations. Your success as a student in this course, and mine as an instructor will be measured by your obtaining the ability and confidence to do so. This can only be accomplished with ample practice. Homework assignments will generally be given through WebAssign, an online system. The assignments will include qualitative questions as well as quantitative problems involving the application of physics concepts. This class is conceptual physics, so a lot of your problems will require you to think, not just do math. I want to teach you how to think and appreciate the world around you better. At the end of the semester, I will drop your lowest scoring homework. Late homework will not be accepted after the due date. You have a trial period after the start of class to use WebAssign freely. To continue completing your assignments and accessing files and announcements, you will need to purchase access (~ $30) before the trial period ends.

Pre-Lecture Questions

Before each lecture (other than review days and exam days), I will post a few homework questions online that those lectures will be covering. This is to encourage you to at least familiarize yourself with that day’s lecture material BEFORE class. Students discover that they get more out of lectures when they have first thought about the material beforehand.
Mid-Term Exams (4 of them)

- Exam questions will be similar to homework problems, problems from the text, and example problems from lecture.
- At the end of the semester, the lowest exam score will be dropped. You may not make-up a missed exam.
- I plan to ask 30 multiple choice questions on each mid-term exam. Almost all students find this is plenty of time to properly address each question in the allotted time.
- You may use a "cheat" sheet, or reference sheet, during the actual exam. It may be up to the size of an 8.5x11" sheet of paper (one side or both). I am testing on your understanding of physics concepts and whether or not you can reason through some new problems; thus, I am fine with you having a "cheat" sheet to help you with things like equations, formulas, etc.
- You may use a calculator on an exam. Most students find that they do not actually need one with the way I word questions and answers, but nonetheless, you may feel better bringing one.
- IF any of you non-native English speakers feel compelled to have a dictionary, then I will allow it. Just ensure it is only be used for looking up words and nothing else.
- IF you take the actual exam, then you will have the OPTION of re-taking the exam through WebAssign after the test. It will be available after the exam and due before the next lecture. You will not know your exam day score before then. You will not have the option of getting multiple tries with each question on the retake, as you do with homework. Here is what is posted on the retake exam on WebAssign:

Description
This is the same exam you took in class. If you took the exam on exam day, then this allows you to make up some points you may have missed on exam day.

Instructions
If you choose to submit this exam retake, then I will average your exam day score with this exam retake score and give you that average score for the exam. So, by figuring out these questions you can raise your exam day score. However, if you choose not to submit this exam retake, then I will simply record your exam day score as the final result for this exam. Thus, if I see that this exam retake's score is anything but zero, I will average the two scores. Please realize that you only get one submission this time!

Final Exam
The final exam will cover material from the entire semester. It will be held on Tuesday, December 13, 2016 from 10:30 a.m. to 12:30 p.m. in your regularly scheduled classroom (JFB 101). There will be no make-up exam. Final Exam Schedule.

Superhero Paper
The Superhero assignment is really a design your own superhero project. I am looking for accurate application of scientific ideas to possible superpowers. You will receive a separate instruction sheet explaining everything expected.

Approximate Grading
<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>Grade Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clicker Participation</td>
<td>10%</td>
<td>90 - 100% A</td>
</tr>
<tr>
<td>Homework</td>
<td>25%</td>
<td>80 - 89% B</td>
</tr>
<tr>
<td>Pre-Lectures</td>
<td>05%</td>
<td>70 - 79% C</td>
</tr>
<tr>
<td>Mid-Term Exams</td>
<td>30%</td>
<td>60 - 69% D</td>
</tr>
<tr>
<td>Superhero Paper</td>
<td>10%</td>
<td>0 - 59% F</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
<td>100%</td>
</tr>
</tbody>
</table>

90 - 100% A
80 - 89% B
70 - 79% C
60 - 69% D
0 - 59% F
Resources

The Textbook
I expect you to be reading and studying the textbook. It presents the same material in another way that may resonate better with you. You are only with me for a brief time, yet you have significantly more time with the textbook.

Each Other
Working and studying together in groups is an excellent way to do better in this course. Find some people to work with at the beginning of the semester and exchange contact information.

WebAssign Forum
On the WebAssign website, under "Communications," are the "Forums" for our class. This forum area is like a chat room where students can post questions or comments. Other students, teaching assistants, or the instructor may respond. If this forum feature of WebAssign is used often, then it can be a great resource for students.

Teaching Assistant
Our teaching assistant is willing to help you. His/her office and hours will be announced.

Lecture Video
I have arranged to have our lectures video recorded. Some benefits are the following: to hear me explain something again; to see demonstrations again; to review material for homework or exams; to catch up if you have to miss a lecture; to show your friends because you are just so excited about physics. If you are thinking that you can now miss class because you will be able to see it later, then I must caution you not to do that, because: you will not be able to ask me questions; you will miss out on the class interactions; your clicker participation points will suffer; and technology may fail.

Concept Mapping
A concept map is a diagram that helps show connections and relationships between different concepts. It can be a way to organize thoughts, build foundations, and review material. The University of Utah provides a Concept Mapping Library Guide to get you started. Software and tutorials can be downloaded at CMapTools. I strongly encourage you to try them and give them a chance.

Tutoring Services
The University of Utah Tutoring Center provides tutoring services. Low-income students may qualify for free tutoring through this program. The Department of Physics & Astronomy may also have a list of student tutors available. See the main office (JFB 201) for a list of possible tutors.

University Writing Center
The University of Utah has a Writing Center to help you improve your writing.

Campus Computer Labs
Here is a list of computer labs open to University of Utah students with valid ID numbers and computer accounts.