Course Syllabus

Description

PHYS 101 is an introduction for non-science majors to the core concepts of physics: motion, force, mass, momentum, energy, rotations and gravity.

The laws governing these concepts are formulated in the language of mathematics, but the course will not go beyond high-school level algebra. Many phenomena will be illustrated in lecture demonstrations, animations and computer simulations. The level of the class assumes no prior knowledge of physics whatsoever, but it will require quantitative reasoning.

It will help you succeed in this course if you come to class with a desire to dig deeper into the causes of things you see around you. Words you'll be hearing a lot are: "why," "how" and "what if" - because curiosity is what makes scientists tick. Physics provides a set of tools that have given us an unprecedented level of insight about the natural world. Because of this, the course also serves the broader purpose of highlighting the significance of basic science in modern society.

The course focuses on mechanics and its manifestations in everyday phenomena and the cosmos. Newton's laws of motion and of gravity provide an early example of the changes in western thought embodied by the Enlightenment. Physics unifies our understanding of 'heavenly' and 'earthly' forces, and in the process provides a framework that extends all the way into the microscopic world of atoms, too.

Required materials

Textbook:

Paul G. Hewitt, Conceptual Physics (10th edition or above, 12th edition preferred)

The book should be available at the Duck store, but the digital version is equivalent. You do not need a digital access key for the Pearson web offerings (Mastering Physics).

You'll need a scientific calculator to be used in homework.

Schedule

This list is an approximate breakdown of topics into seven modules. Chapters refer to the textbook:

Paul G. Hewitt, Conceptual Physics (10th edition or above).

1. Ch 1,2: Velocity, acceleration, force

2. Ch 3: Relative motion, free fall
3. Ch 4: Interplay of force and inertia

4. Ch. 5, 6: Action, reaction and momentum

5. Ch. 7: Energy

6. Ch 8: Rotational motion

7. Ch. 9: Universal Law of Gravitation, Satellites

I will also assign some sections of other chapters (Ch 12) and appendices to read. The detailed assignments for each week are given in the titles of the reading quizzes. You'll get new readings with each module, approximately every 4 days.

Logistics

Instructor: Prof. Jens Noeckel (noeckel@uoregon.edu),

There is no meeting time listed in the catalog.

This is a one-term course, compressed into the space of 28 days, including weekends. To cover all the material, the lectures are posted daily as Panopto videos on Canvas, and you need to watch each lecture within a 3-day window of their posting, to get credit for the quizzes that are interspersed in the video. I will post each lecture as an assignment with a corresponding video link and deadline. It's important not to fall behind, because there will be something new to do every day.

Make sure to check Canvas every day!

Getting help

This is course for non-scientists, so if you have a question about the material it's very likely that you're not alone. So don't be shy about asking questions, including about the problem sets.

Asking questions or participating in discussions on Canvas is a good thing, but it has no effect on your grade in this course.

Lecture questions:

If you have questions about something in the lecture, the easiest thing to do is to open a discussion within Panopto (that's a video delivery platform in Canvas). I will look for questions daily (though I don't get notified in real time), and will answer them either directly or in an announcement. Discussions in a video can be seen by everyone - and if you see someone else's question that you know the answer to, you are encouraged to chime in.

If you have a question that you'd prefer to ask in private, it's best to email me (noeckel@uoregon.edu). For example, if you have a math problem you may want to take a screenshot and attach it to your email.
Canvas has a messaging tool, as well. If you use it, I get notified by email.

There is another tool called Canvas chat, but it's not private and doesn't have notifications so I find it to be less useful.

**Homework and reading questions:**

For the homework, each assignment will include a link to a Discussion thread for that homework. I'll monitor that discussion for questions. In that thread, I will usually also post a short video with hints on how to do the problems.

If you have questions about the reading, please let me know by email or open a new thread in the Discussion section on Canvas.

**Grading**

Grades for the course will be based on quizzes in the lectures and in separate assignments. **There will be no midterms or final exam** because I don't see an equitable and cheat-proof way of having such exams online. The relative weights will be as follows:

- In-lecture quizzes: 10%
- Reading quizzes: 50%
- Homework quizzes: 40%

I will drop your lowest 3 in-lecture quiz scores and your lowest homework quiz score in computing your final grade (missed quizzes count as zero scores). If time permits, I'll also post one extra-credit homework-style assignment at the end of August.

You're allowed to work together or use external resources to answer any of the quiz questions. The score for all quizzes is based on the number of correct answers. You don't get points for incorrect answers, but you don't get penalized for them either. If you don't attempt a quiz by the deadline, that counts as a wrong answer.

**In-lecture quizzes** will appear at certain times during the lecture video. They are multiple choice. The deadline for answering the lecture quizzes is posted under "Assignments", and the lectures are found on the course home page. **There are no points for late submission.**

**Reading quizzes** go along with the reading assignments for each module. They are multiple choice. **There are no points for late submission.**

**Homework quizzes** will be posted separately on Canvas with their own deadlines, approximately every 4 days. They are called *Problem Set*, but are listed as quizzes. You have two attempts to answer each question on the homework. **For a submission that's up to 24 hours late, you get a score that's reduced to 80% (i.e. 20% subtraction).**
The homework quizzes can be multiple choice or may require numerical calculations. This means you will need a calculator! If you don't have one, here is a free online scientific calculator:

https://pages.uoregon.edu/jenscls/physicsCalculator.html

The homework quizzes will also have a link to the Canvas Discussion board where you can ask questions about the assignment.

**Pass/fail grading option:** a passing grade requires the equivalent of a C grade on all course work (quizzes, homework, midterms, and final).

**Grading scale:** the nominal grading scale for this course is below. If the final class average is excessively low, I may apply a curve for a higher average final grade. However, you are guaranteed at least the grade listed below based on your final average; you are not competing with others in the class for your grade.


**Academic Honesty**

Students are expected to abide by university policies on academic honesty, avoiding plagiarism, fabrication, cheating, and academic misconduct. The Student Conduct Code (conduct.uoregon.edu) provides definitions of these terms and explanations of the university policy on the subject. The UO Library also provides a guide to avoiding plagiarism (libweb.uoregon.edu/guides/plagiarism/students/). You are responsible for understanding these regulations and abiding by them. Students should be particularly careful to avoid plagiarism in out-of-class assignments, as well as projects and exams. Academic dishonesty will be dealt with severely, as it is disrespectful to your fellow students and your instructor, as well as being against both university regulations and state laws.

**Other resources**

Lastly, the University’s Academic Learning Services (ALS) may also be able to assist UO students. For more information see als.uoregon.edu, or call (541) 346 3226.

**Students with disabilities**

If there are aspects of the instruction or course design that result in barriers to your inclusion, please notify Prof. Noeckel (noeckel@uoregon.edu) as soon as possible. You are also welcome to contact Disability Services in 164 Oregon Hall, 346-1155.

**Course Summary:**
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<th>Date</th>
<th>Details</th>
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<td>Wed Aug 5, 2020</td>
<td><a href="https://canvas.uoregon.edu/courses/161716/assignments/932678">Lecture 1</a> due by 11:59pm</td>
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<td>Fri Aug 7, 2020</td>
<td><a href="https://canvas.uoregon.edu/courses/161716/assignments/933112">Problem set 1</a> due by 11:59pm</td>
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<td><a href="https://canvas.uoregon.edu/courses/161716/assignments/932677">Read chapter 1 and 2.1 - 2.5</a> due by 11:59pm</td>
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<td>Sat Aug 8, 2020</td>
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<td><a href="https://canvas.uoregon.edu/courses/161716/assignments/933197">Lecture 4</a> due by 11:59pm</td>
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<td>Mon Aug 10, 2020</td>
<td><a href="https://canvas.uoregon.edu/courses/161716/assignments/933173">Read Ch. 2.6 - 2.7, and 12.3 on Elasticity</a> due by 11:59pm</td>
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