Physics 108 – Astronomy Laboratory – Spring Semester 2018
Online Learning

Instructor

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University email is preferable to a phone call, and will provide you with a written response you can save. Video conferences in my "virtual office" are available too, through the Zoom conferencing system if you have a microphone and webcam, or an Android cellphone or Iphone. Please send an email first to set up an appointment and for connection instructions.

Objectives

This course offers a "hands-on" opportunity to learn by exploration and discovery how physicists and astronomers have arrived at their current understanding of the universe. There will be experiments you will do on your own at home, guided exercises with web-based resources, and use of images and data from the university's telescopes in Kentucky, Arizona, and Australia. Our overall objective is for you to learn how thoughtful reasoning about experiments and observations is the foundation of physics and astronomy. It meets the University's General Education Requirements for a Natural Science laboratory. There is a separate optional Physics 107 Elementary Astronomy course which should be taken concurrently or before taking this lab. It is also offered online.

As with other General Education Natural Science classes, the objective of this course is to incorporate astronomy into your critical thinking skills, and to understand how the methods of science work. We will do that by exploring how physics and astronomy help us unravel the underlying mysteries of the Universe, and to

1. Help you understand (and cope with) astronomy encountered in everyday life: seasons, solar energy, and the GPS in your cell phone.

2. Provide a basis for understanding the latest developments about astronomy you will hear in the news.

3. Recognize that while physics does not fully explain the universe, it does predict the effects of intangible invisible things, even though nobody knows what they really are ... yet. (That is, not to fret when something seems incomprehensible, since science itself still does not explain everything, and has to rely on predictable behaviors of invisible things such as gravity and the properties of the fundamental particles which nobody completely understands.)

4. Present you with mysteries not yet solved, or with contradictory or untested theories, so that you may solve them in the future and win a Nobel Prize or have fun trying. (There is plenty of astronomy, not to mention physics, that we do not yet know.)

5. Teach physics and astronomy that you may apply to make life better for yourself and others now, and in the future.

6. Open your mind to new discovery by knowing that the universe should be understandable.

Requirements

The class website will guide you through experiments or observations on different weekly topics over the semester, and will pose specific questions to answer. While you may work on these on- or off-line, your responses will be entered online interactively and will be graded. We reserve the right not to accept work that is late, but please let us know when you need extra time.

While you study, you are expected to use the discussion forum on the website with other students in the same way that you would work with one another for any class. This is a very important part of the class and we monitor the forum to see where you are having difficulty. We encourage collaboration and peer instruction because our goal is to have you participate in the activities to gain an understanding of the science, and learn by whatever means you find most helpful, but of course you must do your own work. We will try to resolve questions you may have for the class as a whole through the discussion forum whenever we can, and to respond to email individually as needed.

Use the discussion forum, take your time to understand, ask questions when you need help, and remember the objective is to learn how to observe, reason, and use your growing knowledge and skill to solve problems. Individual and group assistance through email, Google Hangouts, our Zoom video conferencing system, or telephone is available on request.

Websites

The University's Blackboard system is the University's gateway to Distance Education programs:

http://blackboard.louisville.edu/

Use your University *User ID* and *Password* to log into Blackboard for announcements. For this Astronomy Laboratory, however, all of the content and responses to work will be managed on our program website at

http://prancer.physics.louisville.edu/moodle

This site is available only to registered students, and it requires a personal password that is different from your university computer password. Instructions on how to use this system will be posted on Blackboard and sent to registered students by email on or before the first day of classes. Please contact Professor Kielkopf if you have not received this by the second day of classes, or if you have difficulty logging into the website. The University's Help Desk can only respond to questions about Blackboard.

Textbook

The content will be provided online through the class website. There is no textbook for this class. In many cases, simply by using a Google search and looking for an appropriate entry in the Wikipedia you can find an answer to basic physics and astronomy questions, and links to far more detail than most textbooks provide. If you follow this suggestion, be selective in accepting answers from Internet resources. Wikipedia has proven to be very reliable, as are the sites supported by NASA, ESA, or ESO, and the selected links we offer.

Information on useful software and other materials will be provided online. No matter what kind of computer you use, there will be tools available for you. While we are working to provide all content through advanced web-based technology, this is still under development and access to a desktop or laptop rather than a tablet or cellphone may be necessary for some of the required work. If you have problems with class content or software, please use our website and post your question to the Discussion Forum. Often other students have seen the same issue and will know the answer, or if not, we can work together to a solution.

Evaluation and Grading

Plan to complete one experiment each week, and to respond to the weekly lab "quiz" on the class website. You may do the work at any time during the week, and you may return to the quiz to modify your answers as often as you want. A new experiment or activity will be made available each week through the end of the semester. Although the initial scoring of most questions is done automatically, where possible, if we see an issue about what you have submitted, we may ask for you to respond again before we assign a final score for credit. Remember, our purpose is to help you learn and understand by observation and reason, not to hear an echo of a precisely "correct" textbook answer.

An additional 5% will be added for students who make consistent thoughtful contributions to the forum discussions on the class website.

We will average all of your work and assign letter grades approximately A (90 to 100); B (80 to 89); C (70 to 79); and D (60 to 69).

Caveats

We reserve the right to make changes in the syllabus when necessary to meet learning objectives, when new astronomical discoveries occur, or when there is a technical or software issue that requires a change in content or methodology. Any changes will be announced by email and posted in the current online syllabus and schedule.

Title IX/Clery Act Notification

Sexual misconduct (including sexual harassment, sexual assault, and any other non-consensual behavior of a sexual nature) and sex discrimination violate University policies. Students experiencing such behavior may obtain confidential support fromthe PEACC Program (502.852.2663), Counseling Center (502.852.6585), and Campus Health Services (502.852.6479). To report sexual misconduct or sex discrimination, contact the Dean of Students (502-852-5787) or University of Louisville Police (502.852.6111).

Disclosure to University faculty or instructors of sexual misconduct, domestic violence, dating violence, or sex discrimination occurring on campus, in a University-sponsored program, or involving a campus visitor or University student or employee (whether current or former) is not confidential under Title IX. Faculty and instructors must forward such reports, including names and circumstances, to the University's Title IX officer.

For more information, see the Sexual Misconduct Resource Guide.

Syllabus version of December 19, 2017

Getting Started

- From the notice on Blackboard or our emails to you, locate your username and your password to our class website
- Connect to http://prancer.physics.louisville.edu/moodle
- Select your class and log in with your username and password (case sensitive)
- First time login you will be asked to change your password
- Update your profile if you want others to know more about you (optional)
- If you have a problem with this, send an email to `kielkopf@louisville.edu`

What to do Weekly

- Each Monday begins a new activity for that week
- Read the instructions and content on line, work through it at your own pace
- Ask and answer questions on the discussion forum
- Before end of day the following Sunday, complete the "Answer questions about ..." section for that week

January 8 - 15 Watch the sky.

January 15 - 21 Identify constellations.

January 22 - 28 The Earth rotates.

January 29 - February 4 Our dynamic Sun.

February 5 - 11 Light and telescopes.

February 12 - 18 Use a remote telescope (part one of a two-part activity).

February 19 - 25 Experiment with CCD camera images.

February 26 - March 4 Explore Mars.

March 5 - 11 Determine the distance to globular star clusters.

March 12 - 18 Spring break week.

March 19 - 25 Use a CCD camera.

March 26 - April 1 Survey galaxies in Virgo.

April 2 - April 8 Observe satellites of Jupiter, Saturn, or Uranus.

April 9 - April 15 Namibian skies.

April 16 - 22 Report on your remote telescope project (part two).