

PHYSICS 109

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Office Hours: 1pm on Tuesdays and 2pm on Thursdays, and by appointment.

Course Materials: All students must purchase access to the **Mastering Astronomy website**. This includes access to an electronic version of the textbook. All students must also purchase access to the **Top Hat website**. The textbook is *The Essential Cosmic perspective, Ninth Edition, by Bennett, Donahue, Schneider, and Voit*. Purchasing or renting a copy of the textbook is optional.

Description: Physics 109 is an intensive introductory course in astronomy. Topics covered include the solar system, stars, galaxies and the universe as a whole. Elementary physics and mathematics are used to obtain both a qualitative and a quantitative understanding of astronomy.

Learning Objectives: Students who complete this class should have obtained an understanding of how the scientific process works. They should be able to follow the chains of reasoning in detailed scientific arguments in cases where they have the background to understand each link in the chain. They should have an understanding of the solar system, the objects that inhabit our galaxy and other galaxies and the structure of the observable Universe as a whole. They should know about the known history of the Universe and how stars evolve. They should have a familiarity with some of the current mysteries in astronomy such as the origin of the dark matter.

Online Homework: To encourage students to keep up with the reading assignments online homework assignments will be given before most classes. **You must have finished the assignment one-half hour before class begins.** Failure to do so will result in a grade of zero for that assignment. You are allowed to use the textbook and your class notes to help you answer the questions and you may ask the instructor about the questions, **but you may not get help from any other person or source.** The homework assignments will be accessed through the web site at www.MasteringAstronomy.com. **You will need to register for this web site.** The homework will count 15% towards the final grade and the lowest three homework grades will be dropped.

Class Participation Grade: To encourage students to attend class and follow the lecture closely, there will be a class participation grade. To get this grade you must register at the Top Hat website, <https://tophat.com/> and sign into it at the beginning of each class. You can use your computer, tablet, or smart phone to do so. During the class questions will be asked and you will answer them on that website. You will get partial credit for attempting an answer and full credit if you get the answer right.

The class participation grade will count 10% towards the total course grade. The way it will work is that there will be a total grade given for each class which will be normalized to 100 points. The lowest 16 class participation grades will be dropped. This is nearly half of the class participation grades. As a result, there will be **no make-ups given** for the class participation grade.

Exams: There will be three in-class exams during the semester and a final exam. The in-class exams will be on **Monday February 11, Friday March 18, and Wednesday April 20**. The final exam will be on **Friday May 6 at 2pm**. Calculators may not be used for the exams.

Grading: The online homework assignments count 15% towards your final grade. Class participation counts 10%. Each in-class exam counts 15%. The final exam counts 15%. The lab counts 15% of your final grade. **However, if you receive a final lab grade which, out of a total of 20 points, is less than 12 points you will automatically fail the course.**

Labs: Labs will be held in Room 105, Olin Physical Laboratory. **All students must bring their laptop computers to every lab.** Failure to do so may result in you being sent home to get it.

You cannot change your lab section without written permission from me. You may only attend the lab section that you are assigned to.

There will be some outdoor labs and when it is cold outside you should dress **much more warmly** for them than you normally would to travel to and from class. Hats and gloves are strongly recommended. The outdoor labs have priority over the indoor labs so **be prepared to go outside.**

You are expected to attend and complete all twelve of the labs. Your lowest lab grade will be dropped. You are further expected to complete and hand in the work for each lab at the end of that lab session. **If you finish the work at home and hand it in late you will get a zero for that lab.**

Absences: You will receive a grade of **zero** for any exam, homework assignment, or lab for which you do not have an excused absence. Further it is your responsibility to contact me immediately if you miss an exam. **If you miss an exam for some trivial reason such as oversleeping or your car won't start then you must, regardless of your schedule that day, take the exam on the day you missed it. Failure to do so will result in a grade of zero.** Further, if you do not make up the exam before it is gone over in class you will be required to take an oral exam as a make-up. If you miss a homework assignment or a lab because you forgot about it, you should contact me immediately. Forgetting homework assignments or labs more than once will result in grades of zero for those assignments or labs.

If you have an excused absence for a lab, you must get written permission from me in order to make it up. The TA's do not have the authority to excuse absences! Further you must then go to a lab that is doing the same lab you missed and give the note to the TA. It is your responsibility to do so as soon as possible. **Failure to do so will result in a grade of zero for the lab you missed.**

Examples of **acceptable excuses** include illness, family or other emergency, and participation in certain school functions. Examples of **unacceptable excuses** include studying for an exam, dinner with a family member or a friend, **leaving early for Fall Break**, and **any fraternity or sorority function**. If you have already booked a plane ticket (or made some other arrangement) which requires you to leave early for Spring Break or for Good Friday then you must tell me right away **and show proof that this was done before the class began**. If you book a ticket (or make some other arrangement) requiring you to leave early for Spring Break after the class begins then you will simply have to either make other arrangements or take a zero for the missed lab. Note that there will be no lab on the Thursday before Good Friday.

As soon as you know that you will miss an exam, or lab you should send me an email message or call 336-758-4992 and let me know what you are going to miss and why. Do not text this number, it is a fixed phone.

Whenever possible the absence should be excused ahead of time. You may be requested to provide proof of illness, etc.

Tips on How to Study For This Course

In this course there is a large amount of material that you are expected to assimilate. The two things that will help you the most are to **attend all of the classes** and **keep up with the reading**. It is usually difficult to understand everything in a science course the first time it is presented. Therefore, it is important to be exposed to the material a number of times in different ways. When studying it is usually best to **avoid highlighting** parts of the text. This is because science texts tend to be very densely written and you will miss important information. Instead it is best to **take notes** on what you read. This slows you down and gives you a chance to ask yourself whether you really understand the material you are reading.