

# Syllabus for Phys 5 - Stars and Black Holes

## Fall 2019

Tu/Th 12:30-1:50pm 2622 York Hall

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**Instructor: Dr. Alison Coil**

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**Office Hrs:** Thurs 10am-noon

**TA:** Erin George

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**Office Hrs:** Fri 1-3pm, 383 SERF

**Discussion Section:** Wed 5-5:50pm 2622 York

### **Course Description:**

Physics 5 is an introductory course in astronomy, focusing on the evolution of stars, including their birth and death. We will discuss the night sky, the Sun and moon, gravity, atoms and light, stellar birth, stellar evolution, white dwarfs, neutron stars, black holes, and general relativity. We will emphasize the physical principles that govern the Universe and how these have been inferred from observation. We will not discuss planets (Physics 9) or galaxies and cosmology (Physics 7). Physics 5, 7, 9, and 13 (Life in the Universe) form a four-quarter sequence and can be taken in any order. This course is appropriate for all students with an adequate background in high school mathematics; only pre-calculus math is used.

### **Required Text and Other Media:**

*The Cosmic Perspective: Stars, Galaxies, & Cosmology* any edition, Bennett, Donahue, Schneider, Voit.

[You can also buy *The Cosmic Perspective*, but do not buy *The Essential Cosmic Perspective*, which is missing material we will cover.]

*Mastering Astronomy* Access Kit, bundled with textbook at the bookstore, or you can purchase online for ~\$60 at [masteringastronomy.com](http://masteringastronomy.com). All of your homework will be assigned, performed, and graded on this web site. Course ID: PHYS5FALL19 - MUST select 8th edition of Stars, Galaxies and Cosmology book on this website, regardless of which edition of the book you are using

A colored voting card. You are required to bring them to class every day for class participation. Available to download and print from TritonED page.

We will use TritonED ([tritoned.ucsd.edu](http://tritoned.ucsd.edu)) for downloads, announcements, and grades. Look under 'Information' [syllabus, voting card, observational lab, web links], 'Content' [lecture PDFs], and 'Tools - My Grades' [grades]. **DO NOT SHARE THESE MATERIALS WITH ANYONE OUTSIDE OF THIS COURSE! There are legal issues and ramifications.**

## An Active Learning Environment:

This is not a course on the memorization of facts. This course will be an **interactive** exploration of the Universe around you. Studies have shown that you can only learn a limited amount of information from lecture alone, no matter how clear or entertaining. Therefore, this course will be made up of a series of lectures wrapped around **collaborative classroom activities** designed to engage you actively in the learning process. These activities target specific ideas presented in lecture and include questions very similar to those that you will find on the exams.

## Expectations:

Your full participation each day will be an essential component of your success. You are expected to actively participate during **all in-class activities**. Many of the in-class activities involve working in pairs and/or small groups.

### • Academic Conduct:

Please read the "UCSD Policy on Integrity of Scholarship" in the UCSD General Catalog. Dishonesty includes, but is not limited to, copying from another student, allowing others to copy from you, allowing other students to see your exam answers, doing work for others, using cheat sheets, claiming credit for answers which were altered after the work was handed in, talking to or in any way communicating with other students in the exam. Academic dishonesty is a serious offense; any confirmed case of cheating will be referred to the appropriate dean for disciplinary action and the maximum punishments allowed will be pursued in all scenarios. Make your work your own, be original!

### • Course Conduct and Common Courtesy:

For the benefit of your fellow students and instructor, you are expected to practice common courtesy with regard to all course interactions, including:

- Show up for class on time.
- Do not be disruptive in class.
- **Turn off your cell phone before class begins.**
- Be attentive in class, put away all device and newspapers, etc.
- Laptops should be open for note taking **only**, please no web surfing.
- Be kind and respectful to your fellow students and your instructor.

You may be asked to leave lecture if you do not practice common courtesy.

### • Academic Accommodations:

If you have a documented disability, or otherwise have been certified as needing special exam considerations, contact me within the **first two weeks** of the course to discuss accommodations. I will not accept requests the night before an exam.

## Course Requirements and Grading:

Your final grade will be based on the following work:

- **Observational lab:** A lab assignment will be due Tuesday, Nov 26. Information on the lab will be provided the second week of class.
- **Reading Quizzes:** Each week you will be required to complete a reading quiz using *MasteringAstronomy.com*, which will test your understanding of key concepts in the assigned reading. Reading quizzes are due Thursday evenings at 11pm. **No late reading quizzes will be accepted; *the lowest score will be dropped.***
- **Homework:** Weekly homework will be assigned to assess your understanding of the material covered in both the textbook and lecture. All homework will be completed using *MasteringAstronomy.com*. Homework assignments are due Friday evening at 11pm (except for Ch 16, which is due Wednesday Nov 13). **No late homework will be accepted; *the lowest score will be dropped.***
- **Exams:** Three multiple-choice exams will be administered during the semester: two midterms (in class) and one final exam (which will be cumulative). **Do not make plans that interfere with scheduled exams as no late exams are given.** Only those with an official, signed conflict may miss the in-class midterm exams. Exam questions will be drawn from lecture material and homework questions. Exams are closed-note, closed-book, and you will not be able to use phones or calculators. You will be given the equations you might need on the exam. You need to buy 3 scantron sheets: FORM NO. F-289-PAR-L (red, half-sheet, with 100 questions) for the midterms and final.

**Final Grade:** There will be no extra credit.

1. Observational Lab 5%
2. Reading Quizzes (drop 2 lowest) 10%
3. Homework (drop 2 lowest) 25%
4. Midterm Exam (15% each) 30%
5. Final Exam 30%

Your course grades are available on TritonED only. It is your responsibility to discover and notify me of any errors before week 9. Final letter grades will be given as:

A+ 97-100%	A 93.0-96.9%	A- 90.0-92.9%
B+ 87-89.9%	B 83.0-86.9%	B- 80.0-82.9%
C+ 77-79.9%	C 73.0-76.9%	C- 70.0-72.9%
D 60-69.9%	F 0-59.9%	

## How to Do Well in Phy 5:

There are no prerequisites for this course and no background in astronomy is assumed. How well you do in this course will depend on your willingness to work hard and ask questions. To succeed you should:

- Read the Preface of the textbook called “How to Succeed in Your Astronomy Course”
- Keep up with the chapter readings outlined in the class schedule below. You will get much more out of lecture if you have read the material *ahead of time*.
- Attend every lecture. Much of the exam material will be drawn *directly* from lecture.
- Attend the discussion section; it is your principle means for outside help.
- Come to office hours, especially for homework questions!
- Ask questions! Don’t assume you are the only person with a question. Ask questions during lecture, after lecture, during discussion section, and in office hours.
- Turn in all homeworks and quizzes on time. Do not procrastinate, allow yourself time to complete the homeworks and quizzes.
- Use the Mastering Astronomy study tools - they are designed to help you learn the material and overcome common errors.
- Don’t confuse reading the textbook or your notes with studying and comprehending the material. You will be asked to *apply* your knowledge.
- If you are falling behind or are confused with the material, let me or the TA know so that we can help you.

## Closing Thoughts

Few topics have inspired humans throughout history as much as the mysteries of the stars. This class offers you an opportunity to explore these mysteries in depth, learning both about our tremendous modern understanding of the Universe and also how science works. If you work hard and learn the material, this course could be one of the most rewarding classes of your college career.

You can not escape science in today’s world. You are living in a complex society where science plays an ever-increasing role. It is crucial that you understand how science and scientists work, since you will find yourself voting on, reading newspaper articles about, and using the products of scientific research every day for the rest of your life.

## Class Schedule

	Date	Lecture Topics	Reading
Th	Sept 26	Syllabus / Our Place in the Universe	Ch 1
Tu/Th	Oct 1/3	The Night Sky, Seasons	Ch 2.1-2.2 (S1)
Tu/Th	Oct 8/10	Moon, Motion	Ch 2.3-2.4, 4.1-4.3
Tu/Th	Oct 15/17	Gravity, Tides, Light and Matter	Ch 4.4-4.5, 5.1-5.3
Tu	Oct 22	<b>Midterm #1 (Ch 1, 2, 4)</b>	
Th	Oct 24	Light and Matter	Ch 5.3-5.4
Tu/Th	Oct 29/31	The Sun, Surveying the Stars	Ch 14, 15
Tu/Th	Nov 5/7	Surveying the Stars, Star Birth	Ch 15, 16
Tu	Nov 12	Star Stuff	Ch 17
Th	Nov 14	<b>Midterm #2 (Ch 5, 14, 15, 16)</b>	
Tu/Th	Nov 19/21	Star Stuff, Stellar Graveyard	Ch 17, 18
Tu	Nov 26	Black Holes	Ch 18
Th	Nov 28	<i>No Class! (Thanksgiving)</i>	
Tu/Th	Dec 3/5	Black Holes, General Relativity	Ch 18, S3
Fri	Dec 13	<b>Final exam: 11:30am</b>	

Do not make travel arrangements that conflict with the final exam. **Exams are not given early and there are no make-up exams.**

## Homework Schedule

There are a total of 9 reading quizzes and 9 homeworks,  
all due online at MasteringAstronomy.com

**Reading quizzes are due Thursday at 11pm (except Ch 16)**  
**Homeworks are due Friday at 11pm (except Ch 16)**

Quiz / Homework Due Date	Reading
Oct 3 (quiz) / 4 (homework)	Ch 1
Oct 10 / 11	Ch 2
Oct 17 / 18	Ch 4
Oct 24 / 25	Ch 5
Oct 31 / Nov 1	Ch 14
Nov 7 / 8	Ch 15
<b>TUESDAY</b> Nov 12 / 13	Ch 16
Nov 21 / 22	Ch 17
Nov 28 / 29	nothing!
Dec 5 / 6	Ch 18