

ASTRONOMY 0088_SEC1100: 2194 Syllabus (Spring 2019)

STONEHENGE TO HUBBLE



“The effort to understand the universe is one of the very few things which lifts human life a little above the level of farce and gives it some of the grace of tragedy”.

~ Steven Weinberg, 1993

Lecture Class: We, 6:00-8:30 pm, 104 Thaw Hall

Recitation Class: We 8:40-9:30 pm, 104 Thaw Hall. See below.

Instructor:



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Office Hours: The Instructor will hold office hours in 834 Alumni Hall on Wednesdays from 4:30-5:30 pm (before lecture), and by appointment as needed. Please schedule appointments in person, either before or after class, or by email. The course TA will schedule and post their office hours during the first week of class.

Text Book: There is **no required text to purchase for this course**. Instead, lectures are based, in part, on Open Educational Resources – available FREE online – and readings will be assigned as appropriate through CourseWeb.

Course Rationale and Description: This is a self-contained course for students not majoring in the physical sciences. The course is conceptual and descriptive in nature but, since astronomy is a quantitative science, some of the lectures will make use of simple arithmetic and geometry.

The course focuses on a historical perspective of our current understanding of our place in the Universe and on practical astronomy.

We start with a discussion of the nature of science and the process of scientific discovery, and a discussion of the earliest views of the Universe. This takes us from humankind's belief in an Earth-centered Universe to a Sun-centered Universe and up until the time of Newton.

We then focus on practical astronomy topics. This includes phenomena which can be readily observed with the unaided eye or a small telescope (seasons, tides, phases of the Moon, eclipses, the motion of the planets, other solar system objects, constellations, stars, nebulae, and galaxies), the use of small telescopes for astronomical observations, and practical topics related to optics.

The historical perspective then continues with a discussion of our modern view of the Universe, from successive realizations that the Sun is not at its center, that our Milky Way Galaxy is not at its center, and that we live in one Galaxy in an expanding Universe of about 1000 billion galaxies. The modern triumph of the Big Bang Theory for the origin of the Universe over the Steady State Theory is also discussed, along with some current speculative ideas about the nature of the Big Bang.

Finally, we conclude with discussions of unmanned space exploration of the solar system and the possibility of life elsewhere in the Universe

This course fulfills the Physical Science course requirement for School of Arts and Sciences students. It forms an appropriate sequence with Astronomy 0089 (Stars, Galaxies and the Cosmos), Astronomy 0087 (Basics of Space Flight), Physics 0081 (Space and Time, Light and Matter) or Physics 0089 (Physics and Science Fiction).

Major Content Areas:

- I. The Nature and Process of Science
- II. Ancient Astronomy
- III. The Greek Era
- IV. Start of Modern Astronomy
- V. Our Place in the Cosmos – Size, Structure, and Motion of the Earth-Moon System, the Solar System, Milky Way Galaxy, and the Universe.
- VI. Space Science – The Exploration of Space
- VII. Current Cosmology
- VIII. The Future: Deep Space, Life in the Universe, and Interstellar Exploration.

Course Learning Objectives:

By the end of this course, students will be able to...

1. Identify and describe the key components, major steps, and unique processes of scientific inquiry.
2. Describe the major historical figures and their contributions to the development of astronomy.
3. Identify objects in the universe, understanding them in terms of their sizes, ages, distances, composition and evolution.
4. Evaluate the ways in which the evolution of the universe has influenced the development of life on Earth.
5. Describe exploration of space by robotic spacecraft, and discuss the possibility of life beyond Earth.

Course Notes and Other Materials: The course Syllabus, Power Point lecture files, external links, and any other relevant course materials will be found posted on CourseWeb. Students should also consult CourseWeb regularly for announcements or updates. Assigned reading material will be clearly identified and may appear on the Exams.

Recitation Class Sections: Each student should be signed up for the recitation class section which are offered on **Wednesdays, 8:40-9:30 pm in 104 Thaw Hall.**

The recitation classes provide time for:

The discussion of readings/homework assigned in the lecture class, discussion of questions on lecture class topics, more detailed consideration of any in-class demonstrations, and several exercises/quizzes throughout the semester dealing with class material in more depth. They will also be used for both pre and post Exam review sessions.

Attendance at recitation is for your benefit and is **not** mandatory. However, attendance is strongly recommended, and material covered in recitations may appear on Exams. **Recitation sessions will begin on January 16th.**

Exams and Exam Policy: Students must bring their **ID cards** to all Exams and must have their **PeopleSoft Number**. Four Exams of equal point value (50 points for each Exam) will be given and the lowest grade will be dropped (**leaving 150 total Exam points counted toward the Course Grade**).

The first three Exams will each cover one-third of the course material, but the final Exam will be **cumulative**. The Exam questions will be multiple-choice.

The FINAL EXAM is optional for those who are satisfied with their 3 previous exam scores. **Because of the policy of dropping the lowest Exam grade, make-up Exams will NOT be given in this course, except under extreme circumstances as determined by the instructor.**

There will also be a **mandatory** (and fun!) trip to Pitt's **Allegheny Observatory**. Details to follow.

The tentative Exam dates are:

- _ Exam 1: **Wednesday, February 6**, 6:00-7:30 pm (104 Thaw Hall)
- _ Exam 2: **Wednesday, March 6**, 6:00-7:30 pm (104 Thaw Hall)
- _ Exam 3: **Wednesday, April 10**, 6:00-7:30 pm (104 Thaw Hall)
- _ Cumulative Final Exam: **Wednesday, April 24**, 6:00-7:30 pm (104 Thaw Hall)

N.B. - The Final Exam will *only* be administered on the last regularly scheduled class date as listed above.

Attendance Policy: Recitation attendance is not required, as stated above. Lecture attendance is **required**. Students will be allowed **two (2) unexcused absences**. Thereafter, each absence will result in a deduction of **5 points** from the grade point total. **Students are responsible for all material discussed in the lectures**. If you miss a class, ask a fellow student for the notes!

N.B. - There is no lecture or recitation class on Wednesday, March 13, due to Spring Break.

Course Grading Policy: The final course grade will be determined in accordance with the School of Arts & Sciences Policies, and the PHYAST departmental guidelines. The final grade will be based on total point scores at the end of the course. The distribution of total points for the purpose of grading is: Three Best Exams, **150 maximum points**. Letter Grades will be assigned by percentage average as follows:

A+	4.00	Superior	97-100%	145-150 points
A	4.00		93-96%	139-144 points
A-	3.75		90-92%	135-138 points
B+	3.25	Meritous	87-89%	130-134 points
B	3.00		83-86%	124-129 points
B-	2.75		80-82%	120-123 points
C+	2.25	Adequate	77-79%	115-119 points
C	2.00		73-76%	109-114 points
C-	1.75		70-72%	105-108 points
D+	1.25	Minimal	67-69%	100-104 points
D	1.00		63-66%	94-99 points
D-	0.75		60-62%	90-93 points
F	0.0	Failure	59% and Below	89 points or less

Academic Integrity Policy:

Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

Turnitin: Students agree that by taking this course all required papers and other assignments may be subject to submission for textual similarity review to [Turnitin.com](https://www.turnitin.com) for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin reference database solely for the purpose of detecting plagiarism of such papers. Use of Turnitin page service is subject to the Usage Policy and Privacy Pledge posted on the [Turnitin.com](https://www.turnitin.com) site.

Disability Resources:

If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructor and the Disability Resources and Services no later than the 2nd week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call 648-7890 (Voice or TTD) to schedule an appointment. The Office is located in 216 William Pitt Union.

E-mail Communication Policy:

Each student is issued a University e-mail address (username@pitt.edu) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with

the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers (e.g., Hotmail, AOL, Yahoo). Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. To forward e-mail sent to your University account, go to <http://accounts.pitt.edu> , log into your account, click on Edit Forwarding Addresses, and follow the instructions on the page. Be sure to log out of your account when you have finished. (For the full E-mail Communication Policy, go to www.bc.pitt.edu/policies/policy/09/09-10-01.html.)

Classroom Recording Policy:

This course will adhere to the University's Senate Educational Policy Committee recommendation on classroom recording of May 4, 2010:

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussions, recitations, and/or other activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

Intellectual Property Policy:

Per the University's policies regarding copyright and intellectual property, <http://www.library.pitt.edu/copyright-pitt>, the instructor retains the rights to all original course materials – including, but not limited to, lectures, lecture notes, Power Point or other presentations, assignments, exams, papers, diagrams, etc. – and none of this material may be used, shared, or reproduced in any way, for other than a student's own private educational use.

In addition, legal rights for all third-party materials, whether used by direct permission or under the Fair Use educational rules, is fully retained by the original authors. None of this material may be used, shared, or reproduced, in any way, for other than a student's own private educational use, unless permission is granted by the original authors or sources.

Sexual Misconduct, Required Reporting, and Title IX:

The University is committed to combatting sexual misconduct. As a result, you should know that University faculty and staff members are required to report any instances of sexual misconduct, including harassment and sexual violence, to the University's Title IX office so that the victim may be provided appropriate resources and support options. What this means is that as your professor, I am required to report any incidents of sexual misconduct that are directly reported to me, or of which I am somehow made aware.

There are two important exceptions to this requirement about which you should be aware:

A list of the designated University employees who, as counselors and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: <http://www.titleix.pitt.edu/report/confidentiality>

An important exception to the reporting requirement exists for academic work. Disclosures about sexual misconduct that are shared as part of an academic project, classroom discussion, or course assignment, are not required to be disclosed to the University's Title IX office.

If you are the victim of sexual misconduct, Pitt encourages you to reach out to these resources:

Title IX Office: 412-648-7860

SHARE @ the University Counseling Center: 412-648-7930 (8:30 A.M. TO 5 P.M. M-F) and 412-648-7856 (AFTER BUSINESS HOURS)

If you have a safety concern, please contact the University of Pittsburgh Police, 412-624-2121.

Other reporting information is available here: <http://www.titleix.pitt.edu/report-0>

Diversity and Inclusion:

I consider this classroom – i.e. both our shared physical and digital spaces - to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. Students in this class are encouraged to speak up, share their ideas, and participate during class meetings, and in online forums and assignments. All members of this class are also expected to conduct themselves in a professional manner that contributes to a respectful, welcoming, and inclusive environment for every other member of the class.

“Exploration is in our nature. We began as wanderers, and we are wanderers still. We have lingered long enough on the shores of the cosmic ocean. We are ready at last to set sail for the stars.”

— Carl Sagan, Cosmos (1980)