

## **Astro 1 Web Course for World Campus, Fall 2019**

*instructor:* Prof. Robert Morehead

*course office:* 507 Davey Lab, Penn State University Park campus

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*office hours:* Wednesdays 1:30 - 3:30 PM Eastern Time, or by appointment

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### **Course Information:**

*credits:* 3

*class meeting times / location:* No class meetings — material is delivered online, through *Canvas*.

*course start date:* August 26th, 2019

*required text:* None — all material is provided in *Canvas*, and associated external web links.

### **Description:**

The Astro 1 Web section follows the same course outline as other sections of Astro 1, with the term divided into roughly equal-length periods for each of the four major units:

1. **Basic Astronomy and the Nighttime Sky:** seasons, phases of the Moon, the night sky, eclipses, constellations, properties of light, spectroscopy, Doppler effect, telescopes.
2. **The Solar System:** properties of the planets in our solar system, including the Earth and its Moon as well as moons of other planets, laws of planetary motion, formation of the solar system, age of the solar system.
3. **Stars & the Milky Way Galaxy:** the Sun, properties of stars (how they work, mass, luminosity, temperature, color), stellar birth and death, white dwarfs, neutron stars, black holes, star clusters, gas and dust, structure and composition of the Milky Way Galaxy.
4. **Galaxies and Cosmology:** different types and sizes of galaxies, galaxy evolution, dark matter and dark energy, the Big Bang theory and the history of the universe, quasars and gamma ray bursts, extra dimensions and parallel universes.

### **Objectives:**

To engage students in an investigation of astronomy in a more active way so that they will achieve a greater understanding. To cultivate a heightened sense of excitement about recent developments in the field at the same time as teaching basic concepts. To convey the idea that astronomy has relevance to many people, through appreciation of beauty of astronomical objects.

After taking this course, students should be able to:

- describe the position of the Earth in the Universe, in orbit around the Sun which is one of many stars traveling around the center of the Milky Way galaxy that is one of billions and billions of galaxies in the Universe;
- describe why the Sun shines and why stars come in different colors;
- give a brief history of the universe from the beginning of the Big Bang expansion to the formation of galaxies, stars, and planets;
- describe the basic properties of the planets in the Solar System and their moons;
- understand the motions of our Sun, Moon, and stars in the sky over the course of days, months, and years;
- remember three things that are relevant and important about astronomy ten years down the line;
- understand and have interest in newspaper and magazine articles on astronomy written for the public.

### **Schedule:**

The details about how your tests will be given will be emailed to you separately, nearer to each testing period.

For the Fall 2019 semester, the dates [MM/DD] for testing are:

- Unit 1 (reading and all quizzes): 09/15
- *Test 1: 09/19 - 09/22*
- Unit 2 (reading and all quizzes): 10/06
- *Test 2: 10/10 - 10/13*
- Unit 3 (reading and all quizzes): 11/10
- *Test 3: 11/14 - 1/17*
- Unit 4 (reading and all quizzes): 12/01
- *Test 4: 12/05 - 12/08*
- Final: TBA

### **Please make a note of the exam dates on your calendar.**

Each unit's reading material, and the "Summary Quizzes" must be completed by the evening (by 11:59 PM Eastern time) exactly one week before the last day of the testing period on that unit, for full Reading Completion credit.

You can do this course generally at your own pace and convenience, however, do be

sure to allow enough time. It is best to do a bit each week, as opposed to leaving everything for the last day before the assignment is due.

No makeup exams are allowed, except for official University scheduled trips or serious medical emergencies (with appropriate documentation).

### **Requirements:**

- Complete the online material — four "Units" & their "Parts" and the Participation quizzes;
- Complete the pre-course Survey and post-course Survey;
- Take 3 of 4 midterm exams (recommended to take them all, but the lowest score will be dropped);
- Take the Final Exam;
- Participate in the Unit 3 Discussion Group assignment;
- Write a short essay for the wrap up at the end of Unit 4.

In total, we expect about the same amount of your time to be required as in a traditional lecture class in Astro 1. You will see many multiple-choice questions dispersed through the material and you must correctly answer these to progress. If you get them wrong you are usually given hints, and can try again.

For each of a Unit's Parts there is a short Summary Quiz, to be completed in *Canvas* (find it in the "Modules" area). You will be graded on the basis of completing the Summary Quizzes. You get multiple tries to answer all of the questions; you do not have to answer all of the questions correctly on the first try. However, to earn full participation credit for a Unit, you do need to get all of the questions on the quiz correct before the testing period for that Unit begins.

### **Course Prerequisites:**

None.

### **Grading Policy:**

Your overall grade — out of 100% — is calculated based on the following...

- 20% for each of the three highest (out of four) Unit exams = 60% total for Unit exams
- 20% for the cumulative Final Exam
- 20% total for participation, broken up into:
  - 1% for completion of the Astronomy Surveys (in two parts — a pre- and post-course survey)
  - 2% for participation in Discussion Board assignment (during Unit 3)
  - 2% for a 1-page essay to be written upon completion of Unit 4
  - 15% for completion of online material (as recorded by your best score on the Summary Quizzes)

The **guaranteed** grading boundaries (*i.e.*, you will receive at least this grade if you have this final average) are: >93.0% A; >90.0% A-; >87.0% B+; >83.0% B; >80.0% B-; >77.0% C+; >70.0% C; >60.0% D.

### **Attendance Policy:**

Work at your own pace, but each unit must be completed one week before the exam; by 11:59 PM on the due date in order that you receive full participation credit.

### **Academic Integrity Policy:**

The Department of Astronomy and Astrophysics adheres to the Eberly College of Science policy of Academic Integrity, in accordance with the University policy. The Department's detailed policy is to be found on our policy page, where details of procedures in case of suspected violations are provided, as is the full text of the department's policy.

### **Examination Policy:**

There are four mid-term Tests, one on the material from each of Units 1, 2, and 3, and 4; students may drop the lowest of these four (they need not take the exam that they drop, but have the option of taking all four and dropping the lowest). We will not use the World Campus proctoring services and exams will be given on the honor system.

A cumulative Final Exam is also required, and it cannot be dropped.

*No notes or other references may be used, nor calculators or other aids* — you may however have blank scratch paper and a pencil handy to draw figures or work out some calculations, if needed. When the exam approaches you will receive more-detailed instructions on how to take each exam within the specified period.

### **Other Information from the University and Eberly College of Science:**

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*Disability accommodations:* Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. Student Disability Resources (SDR) website provides [contact information for every Penn State campus](#). For further information, please visit [Student Disability Resources website](#).

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: [See documentation guidelines](#). If the documentation supports your request for reasonable accommodations,

your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

This online version of our Astro 1 course should be accessible to most students. If you have special needs, please contact the instructor. We will be able to help.

*Counseling and Psychological Services:* Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

[Counseling and Psychological Services at University Park \(CAPS\)](#): 814-863-0395

Counseling and Psychological Services at [Commonwealth Campuses \(Links to an external site.\)](#)

Penn State Crisis Line (24 hours/7 days/week): 877-229-6400

Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

*Educational equity and Report Bias:* Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the [Report Bias webpage](#).

*Advising:* The Eberly College of Science is committed to the academic success of students enrolled in the College's courses and undergraduate programs. When in need of help, students can utilize various College and University wide resources for learning assistance. <https://science.psu.edu/current-students/support-network/learning-support>.

*The Eberly College of Science Code of Mutual Respect and Cooperation:*

<https://science.psu.edu/climate/support-and-resources/code-of-mutual-respect-and-cooperation>. embodies the values that we hope our faculty, staff, and students possess and will endorse to make the Eberly College of Science a place where every individual feels respected and valued, as well as challenged and rewarded.

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