

ASTR 1403 INTRODUCTION TO THE STARS AND GALAXIES

Spring 2016 Credit: 4 (3 lecture and 3 lab)

Instructor Information

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Course Description:

An introduction to astronomy, emphasizing the study of stars and galaxies. This is a Core Curriculum Course.

Prerequisites:

MATH 1314 or equivalent. Contact the instructor should you have any questions. The astronomy courses ASTR 1403 and ASTR 1404 are not requisites of one another and may be taken in any order.

If you have already completed astronomy course ASTR 1303, then taking ASTR 1403 will NOT count in your degree plan. If you complete ASTR 1303 and ASTR 1403, then only one of these courses can be counted in your degree plan.

Course Goals

- To learn about scientific methods and to achieve an understanding of basic concepts of astronomy based on reading assignments, lectures, computer based activities, and web resources.
- Know basic facts in astronomy, and have sufficiently developed an ability to apply the logic of scientific inquiry, to be able to critically read an article on astronomy in the newspapers or magazines.
- Use astronomical concepts and critical thinking skills to describe our modern understanding of stars, galaxies, and cosmology.

Course Learning Outcomes:

On successful completion of this course, students should be able to

- Describe the daily, monthly, and annual apparent motions of the Sun, the Moon, planets, and stars.
- Evaluate the conditions under which continuous, emission, and absorption spectra are produced.
- Discuss the advantages a space telescope in the Earth's orbit has over a ground-based telescope.
- Explain the Sun's structure and the source of the Sun's energy.
- Describe the relationship of a main-sequence star's luminosity, surface temperature, radius, and mass, with a special focus on how these properties determine a star's position in the HR diagram.
- Compare the stellar evolution paths for low-and high-mass stars in the HR diagram.
- Compare the structure and physical properties of spiral, lenticular, elliptical, and irregular galaxies, with a special focus on how we know this information.
- Describe the currently accepted cosmological models of the Universe, with a special focus on how the discovery of dark matter and dark energy affect our understanding of the evolution of the Universe.

Textbook:

Additional Learning Resources:

List of Astronomy learning resources used in this course and available online for free will be posted on the Eagle Online site for this course.

Textbook Chapters Covered:

Part I: EXPLORING THE SKY.

1. The Scale of the Cosmos.
2. The Sky.
3. The Origin of Modern Astronomy.
4. The Origin of Modern Astronomy.
5. Newton, Einstein, and Gravity.

Part II: THE STARS.

7. Atoms and Starlight.
8. The Sun--Our Star.
9. The Family of Stars.
10. The Interstellar Medium.
11. The Formation of Stars.
12. Stellar Evolution.
13. The Deaths of Stars.
14. Neutron Stars Part

III: THE UNIVERSE.

15. The Milky Way Galaxy.
16. Galaxies.
18. Cosmology in the 21st Century.

Part V: LIFE.

26. Life on Other Worlds.

Lab Assignments

The lab assignments will include working with the Astronomy lab activities, which can be accessed online for free. Information about accessing the online labs via internet is posted on the Blackboard page of this course. You may work with labs on your home computer (as well as on any computer with internet connection) anytime when it is convenient for you. Check Class Schedule on the Blackboard site of this course for the due dates for the labs. Detailed instructions for observational activities will be posted on the web. Students complete observational activities on their own time. All lab reports must be submitted online.

Working with the labs in this class will give you general idea of how astronomers study the Universe in the 21st century. Some labs will allow you to make your own astronomical discoveries! To make these discoveries you will be working with real photos and images from NASA and using the same procedures (although very much simplified) that are being used by professional astronomers.

Testing

There will be four exams and a comprehensive final exam. All exams will be taken online. The final exam will also be taken online during the regular distance education final exam period. The exams are timed. Tests in this course DO NOT include any questions that would require mathematical calculations. Exams will consist of multiple-choice questions only. **The lowest grade for one of the four exams (excluding the final exam) will be dropped.** Final Exam is comprehensive, multiple-choice format and mandatory.

Grade Calculation

Four Exams 40%

Astronomy Labs 40% Final Exam 20%

Grading Scale: 90-100 A; 80-89 B; 70-79 C; 60-69 D; <60 F.

Internet Course

To participate in a Distance Education computer-based course, you should possess a basic level of computer skills. Please visit Distance Education web site at <http://distance.hccs.edu/> to find out more about taking online classes.

This Internet course will cover the same materials as the traditional in-class course. However, you do not have to attend lectures and we will communicate online. You will have to rely on yourself to complete the readings, study the materials, and work with online activities. This course assumes that you have basic computer skills, or a basic level of computer literacy.

You will be expected to check the web site at least two times a week. Be sure to keep up and check in often so that you do not miss any important information.

Disabilities:

Any student with documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the appropriate Disability Support Service Counselor at the beginning of each semester. Faculty is authorized to provide only the accommodations requested by the Disability Support Services Office.

Students who are requesting special testing accommodations must first contact the appropriate (most convenient) DSS office for assistance. Disability Support Services Offices: System: 713.718.5165 Central: 713.718.6164 – also for Deaf and Hard of Hearing Services and Students Outside of the HCC District service areas. Northwest: 713.718.5422 Northeast: 713.718.8420 Southeast: 713.718.7218 Southwest: 713.718.7909

Students who require testing accommodations need to schedule an appointment for testing to ensure that staff will be available for proctoring and to arrange for any adaptive equipment that may be required. Students should contact their distance education instructor's "Instructional Support Specialist" the week prior to each of their exams throughout the semester to confirm that the requested testing accommodations will be met. If you need assistance in determining your instructor's Instructional Support Specialist, please contact your instructor or the Distance Education Counselor.

Academic Responsibility

It is the student's responsibility to be aware of HCCS conduct and academic conduct requirements. It is the student's responsibility to withdraw from the course by the appropriate date as listed in the schedule. Please read the Student Handbook. Any student using unauthorized material on a test is subject to administrative withdrawal from the course and/or a grade of zero for the respective test or report.

If any student is caught cheating on a test or plagiarizing papers, the student will receive a grade of zero on that test or assignment. A second infraction will result in a grade of "F" for the semester. Academic dishonesty includes, but

is not limited to, unauthorized collusion on tests or papers, copying directly from another person's work but passing it off as your own, or using unauthorized "cheat sheets, notes, or other forms of information during a test. Review your obligations in the HCC Student Handbook, page 28.

HCC Course Withdrawal Policy

The State of Texas imposes penalties on students who drop courses excessively. Students are limited to no more than SIX total course withdrawals throughout their educational career at a Texas public college or university. To help you avoid having to drop/withdraw from any class, contact your DE professor regarding your academic performance. You may also want to contact your DE counselor to learn about helpful HCC resources (e.g. online tutoring, child care, financial aid, job placement, etc.). HCC has instituted an Early Alert process by which your professor will "alert" you and Distance Education (DE) counselors that you might fail a class because of excessive absences and/or poor academic performance. **In order to withdraw from your DE class, you MUST first contact your DE professor, PRIOR to the withdrawal deadline to receive a "W" on your transcript.** After the withdrawal deadline has passed, you will receive the grade that you would have earned. Zeros averaged in for required coursework not submitted will lower your semester average significantly, most likely resulting in a failing grade of an "F". It is the responsibility of the student to withdraw from the class; however, your professor reserves the right to withdraw you without your request due to excessive absences. If you do not feel comfortable contacting your professor to withdraw, you may contact a DE counselor. However, please do **not** contact both a DE counselor and your DE professor to request a withdrawal; either one is sufficient. Classes of other duration (mini-term, flex-entry, 8-weeks, etc.) may have different final withdrawal deadlines. Please contact the HCC Registrar's Office at 713.718.8500 to determine mini-term class withdrawal deadlines.

International Students

International Students are restricted to ONLY ONE online/distance education class per semester. Please contact the International Student Office at 713-718-8520 if you have additional questions about your visa status.