

**AST 301**  
**"Introduction to Astronomy"**  
**Fall 2013**

Professor Gregory A. Shields  
TTh 11-12:15 (Unique No. 48480)  
Welch 3.502

**Course Description**

What are the stars? How old are they, how were they born, and when will they die? How does our Milky Way compare to other galaxies? How did the Universe begin? What processes led to the formation of stars and planets? What is the future of the solar system, the Galaxy, and the universe? Are we alone in the universe?

These questions fascinate everyone. Astronomers have some answers, but many questions remain. This course gives a survey of modern astronomy with a focus on stars, galaxies, and the universe at large. Topics include the solar system, stars, interstellar gas, galaxies, quasars, the Big Bang, dark matter, and life in the universe. The course describes the contents and evolution of the universe, as revealed by increasingly powerful scientific instruments. The goals are to leave the student with a picture of our place in the universe and an appreciation of scientific thinking that may be useful in later life.

AST 301 is intended to meet the requirements for Core Component Area "Natural Science and Technology" and may be combined with AST 309, 309L, 309N, 309Q, 309R, 309S, or 309T for a six-hour Core sequence. This course will include work designed to develop skills in critical thinking, communication, quantitative analysis, and teamwork. This may involve such activities as peer-to-peer discussions and critical analysis of key concepts, written or oral presentations on current discoveries, and quantitative problem solving. The course material will emphasize the synthesis of observation and theory to gain insight into the operation of the natural world, drawing on other fields such as physics, chemistry, geophysics, or biology.

Lectures will be illustrated with images and videos. Mathematics will include high school algebra but no calculus. Some homework assignments may involve nighttime observations.

*Prerequisite.* None

*Instructor.* Professor Gregory Shields. Office: RLM 15.224. Phone: 471-1402. E-mail: shieldsga@mail.utexas.edu. Office Hours (subject to change): To be announced. Web page: <http://www.as.utexas.edu/~shields/shields.html>

*Teaching Assistant.* To be announced

*Grading.* Course grade will be based three exams and homework. Exams will be closed book, multiple choice and essay. Exams will cover lectures, assigned reading, and homework. Make-up tests will not be given except for a compelling reason presented in advance or in case of illness. Exam weights and tentative dates are:

First Exam	20%	TBA
Second exam	25%	TBA

Third Exam

30%

TBA

Homework will count 25%, based on grading of selected problems from homework sets.

*Help sessions.* The lecture before each exam will include a review of the material on the exam. Additional help sessions will be scheduled for assistance with the homework and class material. Help session time and place to be announced.

*Required text.* Jeffrey Bennett et al. "The Cosmic Perspective: Stars, Galaxies & Cosmology" (2009, 6<sup>th</sup> edition, ISBN 978-0321642707 [Note: this is an abbreviated version of the full text "The Cosmic Perspective" by the same authors; it differs only by omitting the section on the solar system. Page numbers are the same.]

*Drop Dates.* September 13 is the last day to drop a class for a possible refund. November 5 is the last day to change to or from the credit/no credit basis. After November 5, students may drop the course or withdraw from the University only for urgent and substantiated, nonacademic reasons. Please consult the University's published calendar (<http://registrar.utexas.edu>) to verify these dates and for further information.

*Star Parties.* Every Wednesday evening, if the weather is clear, there will be astronomical viewing with the 16-inch telescope on the roof of RLM Hall. These sessions will start about 7 p.m. during standard time and 8 p.m. when daylight saving time is in effect. There is also a 9-inch telescope on Painter Hall that is open to UT students on Friday evenings and to the general public on Saturday evenings. For observing hours, see the Department of Astronomy public outreach Web page at <http://outreach.as.utexas.edu/public>. You can use the 9-inch yourself if you are checked out on it. McDonald Observatory in west Texas has star parties and public nights (see <http://mcdonaldobservatory.org/visitors/programs>; phone 471-5285).

*About the Instructor:* Professor Shields was born in Los Angeles and grew up in Nebraska and Kansas. He earned a B.S. in Physics from Stanford University in 1968 and a Ph.D. in Astronomy at Caltech in 1973. Following a postdoctoral fellowship at Harvard, he joined the UT faculty in 1974. He served as Chairman of the Department of Astronomy from 1990 to 1994. He teaches both graduate and undergraduate courses at UT. His research interests include studies of nebulae, quasars and black holes, and he has published numerous research papers and popular articles.

*Suggested reading:*

--*A Short History of the Universe*, by Joseph Silk (1994), Scientific American Library (Freeman), ISBN 0-7167-5048-1. A nicely illustrated summary of modern concepts of the evolution of the universe, by a leading theoretical cosmologist.

--*Black Holes and Time Warps: Einstein's Outrageous Legacy*, by Kip Thorne (1994), W. W. Norton & Co., ISBN 0-393-03505-0. A popular-level journey through the concepts of relativity and black holes by a leading expert.

*Other Astronomy Courses.* For other courses offered by the Department of Astronomy, see <http://www.as.utexas.edu> or the UT Undergraduate Catalog or the UT Course Schedule (<http://registrar.utexas.edu>).

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