

AY 206 Section 001: Astron Beyond Solar Syst

Spring 2013

3 Credit Hours

Primary Instructor: Dr. William Keel

Core Designation: Natural Science

Syllabus subject to change.

Prerequisites

From the Student Records System

- MATH 113 (undergrad) with a minimum grade of C-
- Or
- MATH 115 (undergrad) with a minimum grade of C-
- Or
- MATH 125 (undergrad) with a minimum grade of C-
- Or
- MATH 145 (undergrad) with a minimum grade of C-

Course Description

This course provides (1) an introduction to the physical processes in stars and the evolution of stars that leads to the observed properties of stars; (2) a study of the final endpoints of stellar evolution including the nature and production of white dwarf stars, neutron stars, and black holes; (3) an introduction to the properties of galaxies, galactic dynamics, and star formation in galaxies, and (4) the cosmological model that accounts for the presently observed chemical composition of galaxies and stars, and for the presently observed dynamical structures of the Universe. Throughout this course, students will analyze, synthesize, and evaluate astronomical data and concepts.

Student Learning Outcomes

Students will be able to identify key concepts in the sciences, contributing to the development of a broad perspective on the human condition.

Students will be able to recognize and explain the scientific method, and evaluate scientific information.

Students will understand the relationship between light, matter, and energy in an astronomical context.

Students will understand the nature and evolution of stars.

Students will understand the nature and evolution of galaxies.

Students will understand the nature and evolution of the Universe.

Outline of Topics

Date Topic (chapter)

9-Jan No class (AAS meeting)

11-Jan Introduction, overview, pre-test

14-Jan Our Place in the Universe (1)

16-Jan Making Sense of the Universe: Understanding Motion, Energy and Gravity (4)

18-Jan Making Sense of the Universe: Understanding Motion, Energy and Gravity (4)

23-Jan Light and Matter: Reading Messages From the Cosmos (5)

25-Jan No class (UA Physics Contest)

28-Jan Light and Matter: Reading Messages From the Cosmos (5)

30-Jan Telescopes: Portals of Discovery (6)
 1-Feb Telescopes: Portals of Discovery (6)
 4-Feb Space and Time (S2)/Quiz #1
 6-Feb Spacetime and Gravity (S3)
 8-Feb Spacetime and Gravity (S3)
 11-Feb Building Blocks of the Universe (S4)
 13-Feb Exam #1
 15-Feb Our Star (14)
 18-Feb Our Star (14)
 20-Feb Surveying the Stars (15)
 22-Feb Surveying the Stars (15)
 25-Feb Star Birth (16)
 27-Feb Debate: "Have Aliens Visited Earth?" (midterm grade deadline)
 1-Mar Star Birth (16)
 4-Mar Star Stuff (17)/Quiz #2
 6-Mar Star Stuff (17)
 8-Mar The Bizarre Stellar Graveyard (18)
 11-Mar The Bizarre Stellar Graveyard (18)
 13-Mar Our Galaxy (19)
 15-Mar Our Galaxy (19)
 18-Mar Exam #2
 20-Mar Galaxies and the Foundation of Modern Cosmology (20; end of withdrawal period)
 22-Mar Galaxies and the Foundation of Modern Cosmology (20)
 1-Apr Galaxy Evolution (21)
 3-Apr Galaxy Evolution (21)
 8-Apr Galaxy Evolution (21)
 10-Apr Dark Matter, Dark Energy, and the Fate of the Universe (22) / Quiz #3
 12-Apr Dark Matter, Dark Energy, and the Fate of the Universe (22)
 15-Apr Dark Matter, Dark Energy, and the Fate of the Universe (22)
 17-Apr The Beginning of Time (23)
 19-Apr The Beginning of Time (23)
 22-Apr Astrobiology (24)
 24-Apr Debate: "The Ultimate Fate of the Universe"
 26-Apr Astrobiology (24)

Exams and Assignments

3 short quizzes

2 closed-book exams during the semester plus a closed-book final exam (11:30 a.m., Tuesday, April 30).

6-8 homework assignments with problems taken from the book as well as problems assigned by the instructor.

Grading Policy

Exams	30%	2 exams, 15% each
Homework	25%	8-10 assignments
Quizzes	15%	3 quizzes, 5% each
Final Exam	20%	
Presentation	10%	A 15 minute presentation of a recent astronomy press release.

Policy on Missed Exams & Coursework

Homeworks are to be submitted on time. Missed exams may be made up with a doctor's excuse.

Attendance Policy

Some lecture material will not be found in the book, so regular attendance is essential.

Required Texts

UA Supply Store Textbook Information

- **BENNETT (BEST VALUE USED) / COSMIC PERSPECTIVE: STARS, GALAXIES & COSMOLOGY**
(Required)

Other Course Materials

A scientific calculator is required for this course.

Extra Credit Opportunities

No extra credit will be offered in this course, with the possible exception of extra credit problems on an exam.

Policy on Academic Misconduct

All students in attendance at the University of Alabama are expected to be honorable and to observe standards of conduct appropriate to a community of scholars. The University expects from its students a higher standard of conduct than the minimum required to avoid discipline. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student.

[The Academic Misconduct Disciplinary Policy](#) will be followed in the event of academic misconduct.

Disability Statement

If you are registered with the Office of Disability Services, please make an appointment with me as soon as possible to discuss any course accommodations that may be necessary. If you have a disability, but have not contacted the Office of Disability Services, please call 348-4285 or visit 133-B Martha Parham Hall East to register for services. Students who may need course adaptations because of a disability are welcome to make an appointment to see me during office hours. Students with disabilities must be registered with the Office of Disability Services, 133-B Martha Parham Hall East, before receiving academic adjustments.

Severe Weather Protocol

In the case of a tornado warning (tornado has been sighted or detected by radar, sirens activated), all university activities are automatically suspended, including all classes and laboratories. If you are in a building, please move immediately to the lowest level and toward the center of the building away from windows (interior classrooms, offices, or corridors) and remain there until the tornado warning has expired. Classes in session when the tornado warning is issued can resume immediately after the warning has expired at the discretion of the instructor. Classes that have not yet begun will resume 30 minutes after the tornado warning has expired provided at least half of the class period remains.

UA is a residential campus with many students living on or near campus. In general classes will remain in session until the National Weather Service issues safety warnings for the city of Tuscaloosa. Clearly, some students and faculty commute from adjacent counties. These counties may experience weather related problems not encountered in Tuscaloosa. Individuals should follow the advice of the National Weather Service for that area taking the necessary precautions to ensure personal safety. Whenever the National Weather Service and the Emergency Management Agency issue a warning, people in the path of the storm (tornado or severe thunderstorm) should take immediate life saving actions.

When West Alabama is under a severe weather advisory, conditions can change rapidly. It is imperative to get to where you can receive information from the [National Weather Service](#) and to follow the instructions provided. Personal safety should dictate the actions that faculty, staff and students take. The Office of Public Relations will disseminate the latest information regarding conditions on campus in the following ways:

- Weather advisory posted on the UA homepage
- Weather advisory sent out through Connect-ED--faculty, staff and students ([sign up at myBama](#))
- Weather advisory broadcast over WVUA at 90.7 FM
- Weather advisory broadcast over Alabama Public Radio (WUAL) at 91.5 FM
- Weather advisories are broadcast via WUOA/WVUA-TV, which can be viewed across Central Alabama. Also, visit wuatv.com for up-to-the-minute weather information. A mobile Web site is also available for your convenience.