

AS 203 – Principles of Astronomy II
Introduction to Stellar and Galactic Astronomy
Syllabus – Spring 2017

Instructor

Prof. Elizabeth Blanton

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Office hours: W 12:05 – 1:35 pm, F 1:00 – 2:30 pm or by appointment

Teaching Fellow

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Teaching Fellow

Zhexing Li

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T 3:00 – 5:00 pm

Th 2:00 – 3:00 pm

Class Hours and Location

Lectures: MWF 11:15 am – 12:05 pm; CAS 502

Labs: You must sign up for one section; indoor labs are in CAS 521 or CAS 606

A2 Mon. 6:30 – 9:15 pm

A3 Tues. 6:30 – 9:15 pm

A4 Wed. 6:30 – 9:15 pm

Observing Labs: CAS rooftop telescopes

Observing labs will be held immediately after the indoor portion of the labs and will finish no later than 9:15 pm. In case of poor weather, observing labs will not be held. Your TFs will determine whether or not the observing lab will be held before the conclusion of the indoor lab. An audio recording will also be posted on the observatory messaging service (617-353-2630) that gives the weather status of lab. The J. B. Coit Observatory is located on the roof of the CAS building. The stairwell to the observatory is next to CAS room 520. Please note that the observatory is often windier and colder than street temperatures. Observing labs will often require extended periods outdoors so please dress accordingly. Observing labs may sometimes meet in the Astronomy Department Computer Lab, CAS room 606.

Course Website

There is a Blackboard Learn site for this course. I will post slides from lectures as well as homework assignments here. Note that classes will sometimes be taught using the chalkboard rather than powerpoint slides, so you cannot rely on the website to get all of the class notes (only powerpoint slides will be posted). <https://learn.bu.edu>

Required Text

Universe: Stars and Galaxies, Freedman, Geller & Kaufmann, 5th ed.

ISBN-13: 978-1-319-04240-0

The text is available at the BU Barnes & Noble bookstore in Kenmore Square.

Other Texts

The following texts are at a higher level than the required, primary text and you may find them useful to consult. They will be on reserve in the 6th floor Astronomy library.

The Physical Universe: An Introduction to Astronomy, Shu

Astronomy: A Physical Perspective, Kutner

Course Description

In this course, we will study the properties of stars and galaxies, as well as their formation and evolution. Cosmology, the study of our Universe as a whole, will also be a component of the course. The course will consist of three lectures / week as well as weekly indoor and outdoor labs. There will be two midterms and one final exam. Several problems sets will be assigned over the course of the semester for homework.

Principles of Astronomy II is intended as a first year course for those intending to major in Astronomy or Astronomy & Physics, those with a serious interest in astronomy, or those with some background in mathematics. As such, it will be more quantitative than the 100-level introductory astronomy courses.

Labs

The indoor and outdoor labs are an important part of this course. You are expected to attend your indoor session weekly. You also need to attend the outdoor portion weekly, weather permitting.

You should purchase a lab notebook for recording observations, notes, measurements, etc. from your labs. Lab write-ups should include: a title, the purpose of the lab, the procedure you followed, any data you collected including estimates of errors, a description of the analysis of the data and the results you obtained, discussion, and conclusions.

Homework

There will be several problem sets assigned over the course of the semester. Many of the problems will be from your textbook. You must show all of your work in order to get full credit for the problems. The problem sets will generally be due one week after they are assigned.

Exams

There will be two midterm exams and one final exam. The dates of the midterm exams are **Friday, Feb. 17** and **Friday, March 24**. You may only take an exam on a different date if there are extreme circumstances, so please plan around these dates. The final exam will be on **Friday, May 12, 12:30 – 2:30 pm**.

Grading

Grades will be calculated on the following basis:

Homework	20%
Labs	30%
Avg. of 2 Midterms	25%
Final Exam	25%

Academic Conduct

Collaboration with other students on homework and labs is acceptable. However, all work turned in must be by the student, and in the student's own words. Please read and abide by the Academic Conduct Code:

<http://www.bu.edu/academics/resources/academic-conduct-code>

Important Dates

Wednesday, February 1	Last day to add class
Friday, February 17	Midterm Exam #1
Monday, February 20	Holiday, classes suspended
Tuesday, February 21	Substitute Monday schedule of classes
Thursday, February 23	Last day to drop without a W grade
Saturday, March 4 – Sunday, March 12	Spring Recess
Friday, March 24	Midterm Exam #2
Friday, March 31	Last day to drop with a W grade
Monday, April 17	Holiday, classes suspended
Wednesday, April 19	Substitute Monday schedule of classes
Wednesday, May 3	Last day of AS 203
Friday, May 12	Final Exam, 12:30 – 2:30 pm

Labs (other labs may be added or substituted)

Indoor

Time, Coordinates, and Navigation
Intro to IDL (Interactive Data Language)
Reduction of Data from the DCT
The Hyades Star Cluster
The Distance to Zeta Gem (Cepheid)

Outdoor

Observing Constellations and Time
The Distance to Zeta Gem (Cepheid)
Observations of currently visible objects

AS 203 – Course Outline

Dates	Topic	Reading
Jan. 20	Introduction, night sky	Ch. 1
Jan. 23 – 27	Night sky, celestial sphere, time, light	Ch. 2, 5
Jan. 30 – Feb. 3	Spectra, optics, telescopes, detectors	Ch. 5, 6
Feb. 6 – 10	Inverse square law, parallax, stars, magnitudes	Ch. 17
Feb. 13	Stellar colors, HR diagram	Ch. 17
Feb. 15	Midterm review	
Feb. 17	MIDTERM EXAM #1	
Feb. 20	Holiday, classes suspended	
Feb. 21 (Tues.)	Substitute Monday schedule, solar interior	Ch. 16
Feb. 22 – 24	Stars, stellar birth	Ch. 18
Feb. 27 – Mar. 3	Stellar evolution, star clusters, binaries	Ch. 19
Mar. 4 – 12	Spring Break!	
Mar. 13 – 15	Stellar death, white dwarfs, neutron stars	Ch. 20
Mar. 17 – 20	Special relativity, general relativity, black holes	Ch. 21
Mar. 22	Midterm review	
Mar. 24	MIDTERM EXAM #2	
Mar. 27 – 29	Milky Way Galaxy	Ch. 22
Mar. 31 – Apr. 5	Galaxies	Ch. 23
Apr. 7 – 12	Galaxies, clusters of galaxies	Ch. 23
Apr. 14	Galaxies, active galaxies	Ch. 23, 24

AS 203 – Course Outline (cont.)

Dates	Topic	Reading
Apr. 17	Holiday, classes suspended	
Apr. 19	Galaxies, active galaxies	Ch. 23, 24
Apr. 21 – May 1	Cosmology & Early Universe	Ch. 25, 26
May 3	Summary and review	
May 12	FINAL EXAM (12:30 – 2:30 pm)	