

PS 222 (Intermediate Astronomy) – Fall 2017

- Instructor:** Dr. Brian Rachford (rachf7ac@erau.edu)
- Web page:** <http://mercury.pr.erau.edu/~rachf7ac/> (use the “Courses” link)
- Lectures:** MWF 2:00-2:50pm in STEM 221
- Office:** Bldg 74 (AC1) - Room 255 Phone: 928-777-3971
- Office hours:** Monday 11:00-12:00, 3:00-4:15 Tuesday 12:00-3:00 Wednesday 3:00-4:15
Friday 11:00-12:00, and by appointment

<u>Grading:</u>	Points distribution	Letter grades
	Homework 20% (200 pts)	A: 90-100% (900-1000 pts)
	1st mid-term 20% (200 pts)	B: 80-90% (750-899 pts)
	2nd mid-term 25% (250 pts)	C: 65-80% (650-799 pts)
	Final exam 35% (350 pts)	D: 50-65% (500-649 pts)

Catalog course description:

An introduction to the Sun, stars, galaxies, and the Universe as a whole. Overview of the observational properties of these objects, as well as the application of introductory physics for a basic understanding of the objects.

Prerequisite: PS 204; Corequisites: PS 219 or PS 250

Goals:

This is a required course in the Astronomy and Space Physics degree programs and an elective for others. The course applies basic astronomical knowledge gained in PS 204 (General Astronomy) and basic physics to the understanding of the Sun and objects outside the Solar System. The primary goal of the course is an understanding of the appearance and existence of the observed properties of these objects.

Learning Outcomes (from the university syllabus):

After completing this course, students will know how to:

1. Describe the appearance of the Sun and its effects on the Earth
2. Recognize the various types of astronomical objects outside the solar system
3. Discuss the various techniques used to set the cosmic distance scale
4. Explore the various types of stars and their properties
5. Recognize the evolutionary states of stars from birth to death
6. Describe the end products of stellar evolution; white dwarfs, neutron stars, black holes
7. Discuss the overall structure, composition, and evolution of the Universe

Textbook:

Fundamental Astronomy, 5th Edition, Kartunnen, et al. We will cover Chapters 8 through 20.

Attendance:

Regular attendance and punctuality, in accordance with the published class schedule, are expected at all times in all courses.

Homework and in-class policies:

Homework is an essential part of this course. You may discuss the homework with your fellow students, but the work you turn in must be your own. Penalties for handing in work that is not your own range from getting a zero on the assignment to failing the course. Understanding how to solve the homework problems is at least as important as being able to hand in correct homework. Late homework will be accepted on a case-by-case basis with an excused absence (e.g., off-campus athletic, academic, or military activities, significant illness, etc.).

During each class, we will cover one “Topic”, with a total of 32 Topics covering the relevant chapters. The Topics are listed on the last page of the syllabus. For each topic, I will include a few questions to think about before class, along with a homework problem over that material. This information is available at the course website. Each homework problem is worth 6 points.

Exams:

1st mid-term: Chapters 8-11 (20% of your grade)

2nd mid-term: Chapters 12-16 (25% of your grade)

Final exam: Chapters 17-20 (35% of your grade)

The final exam will take place at the standard time for a 2:00-2:50pm MWF class: **Wednesday, December 13th, 8:00-10:00am.**

Assistance:

If you have any questions or concerns, please ask in class, office hours, or by appointment. ERAU is committed to access for all students. It is University policy to provide reasonable accommodations to students with disabilities who qualify for services. If you would like to discuss and/or request accommodations, please contact Disability Support Services (DSS). DSS is located on the first floor of Hazy Library, at the end of the hall. You may stop by, call 928/777-6750, or email the director at: **marcee.keller@erau.edu**

Civil Rights Equity and Title IX:

ERAU seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of harassment, discrimination or sexual misconduct, we encourage you to report this. If you inform me of an issue of harassment, discrimination, or sexual misconduct I will keep the information as private as I can, but I am required to bring it to the attention of the institution’s Title IX Coordinator. If you would like to talk to the Title IX Coordinator (Liz Higgins Frost) directly, she can be reached at Building 49, Dean of Students Office, 928-777-3747, **froste@erau.edu**. For more information, please refer to the Nondiscrimination/Title IX webpage at **<http://prescott.erau.edu/about/health/sexual-misconduct-and-title-ix/index.html>**

Continuity planning:

In the event of a temporary campus closure due to an emergency or disaster situation, courses will continue via electronic communication using Canvas, email, or other services.

Course topics:

1	Solar eclipse
2	Stellar spectral classification (Ch 8)
3	Luminosity and other issues (Ch 8)
4	Types of binary stars (Ch 9)
5	Measuring binary stars (Ch 9)
6	Eclipsing binaries (Ch 9)
7	Stellar structure equations (Ch 10)
8	Stellar energy sources (Ch 10)
9	Stellar evolution timescales (Ch 11)
10	Pre-main and main sequence stellar evolution (Ch 11)
11	Post-main sequence stellar evolution (Ch 11)
12	Solar basics (Ch 12)
13	Solar activity, Part I (Ch 12)
14	Solar activity, Part II (Ch 12)
15	Instability strip (Ch 13)
16	Non-periodic variable stars (Ch 13)
17	White dwarfs and neutron stars (Ch 14)
18	Black holes (Ch 14)
19	Interstellar dust and gas (Ch 15)
20	Physical processes in the ISM (Ch 15)
21	Star clusters (Ch 16)
22	Stellar ages (Ch 16)
23	Overview of the Milky Way (Ch 17)
24	Orbital motions and what they tell us (Ch 17)
25	Types of galaxies (Ch 18)
26	Active galactic nuclei, Part I (Ch 18)
27	Active galactic nuclei, Part II (Ch 18)
28	Cosmic distance scale and Hubble's Law (Ch 19)
29	History and future of the Universe (Ch 19)
30	Exoplanet history (Ch 20)
31	Exoplanet techniques (Ch 20)
32	Life in the Universe (Ch 20)

Important dates:

	Monday	Wednesday	Friday
Week 1	28 Aug 2017	30 Aug 2017	01 Sep 2017
Week 2	04 Sep 2017 Labor Day	06 Sep 2017	08 Sep 2017
Week 3	11 Sep 2017	13 Sep 2017	15 Sep 2017
Week 4	18 Sep 2017	20 Sep 2017	22 Sep 2017
Week 5	25 Sep 2017	27 Sep 2017	29 Sep 2017
Week 6	02 Oct 2017	04 Oct 2017	06 Oct 2017
Week 7	09 Oct 2017	11 Oct 2017	13 Oct 2017 Mid-term break
Week 8	16 Oct 2017	18 Oct 2017	20 Oct 2017
Week 9	23 Oct 2017	25 Oct 2017	27 Oct 2017
Week 10	30 Oct 2017	01 Nov 2017	03 Nov 2017
Week 11	06 Nov 2017	08 Nov 2017	10 Nov 2017 Veteran's Day
Week 12	13 Nov 2017	15 Nov 2017	17 Nov 2017
Week 13	20 Nov 2017	22 Nov 2017 Thanksgiving	24 Nov 2017 Thanksgiving
Week 14	27 Nov 2017	29 Nov 2017	01 Dec 2017
Week 15	04 Dec 2017	06 Dec 2017 Review	08 Dec 2017 Study Day
Finals Week	Final exam, Wednesday, Dec. 13th, 8:00-10:00am		