ASTR 1504 - Descriptive Astronomy

Fall 2026 Syllabus, Section 04, CRN 40007,

Credit hours: 3

Instructor

John Feldmeier

Email: jjfeldmeier@ysu.edu

Public Instructor Information

Dr. John Feldmeier, Professor

- Distinguished Professor, Youngstown State University, 2019
- Astronomy and Astrophysics Postdoctoral Fellow, National Science Foundation, 2003
- Ph.D. Astronomy and Astrophysics, Pennsylvania State University, 2000
- B.S. Physics, University of Texas, Austin, 1994
- B.A. Astronomy, University of Texas, Austin, 1994

Office Location: Ward Beecher Hall, 2021
Office Phone: 330-941-1381

Course Description

1504. Descriptive Astronomy. Scientific method, introduction to modern understanding of the universe, astronomy and society, humanity's place in the universe. Astronomical observing methods, the solar system, stars and star systems, galaxies, cosmology. Recent astronomical discoveries. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Astronomy-2E	Fraknoi, Morrison, and Wolff	978-1-951693-50-3
Required	Lecture Tutorials for Introductory Astronomy, 4th Edition	Prather	0135807026

1. Astronomy-2E - this is a **free online astronomy textbook** at https://openstax.org/details/books/astronomy-2e
2. Lecture Tutorials for Introductory Astronomy, 4th edition - don't use earlier editions. The latest copy has a purple cover. **Bring this workbook to class every day!**

Course Reading Assignments from the Class Textbook

In almost all college classes, you will need to read some written material, think about that material, and then use that material in class. Astronomy is no different. This section will show how we will handle required reading in this class.

Remember you can read the textbook two ways for free online: 1) go to https://openstax.org/ details/books/astronomy-2e and read it using a web browser, 2) go to the same website, and download the PDF file for the entire book and read the textbook using a computer or tablet.

We do not read the entire textbook - instead, we read specific sections of the textbook, given below. Each chapter of the textbook has an introduction section, usually called "Introduction" or "Thinking Ahead." I have labelled these introduction sections with zero in the decimal point in the table below - for example "1.0" means "Read the introduction section in Chapter 1." Other sections of each chapter are numbered in the decimal point, and have names - for example, "6.1" means "Read Chapter 6, Section 1 - Telescopes." At the end of the book, there are some articles in the appendix that have also been assigned for you to read. These are listed by letter.

For each reading assignment, look at the listing below. If only a number or letter is present, that means "Read that entire section." If the number has words after it, that means "Read the specific subsections named inside the parentheses, but you don't have to read the entire section." The symbol "L.O." means "Read Learning Objectives subsection." Do read the sections in the order I've given - they are designed to match the class notes and lectures. If you are not sure, please ask me!

Your class reading will be graded by questions in the Checkpoint assignments and in the class exams. Some of these questions will not be covered within class time. **So, to be clear: If you don't do the class reading, you will do poorly in the class!**

Reading Assignment 1: Appendix A, 1.0, 1.1, 1.2, 1.3, 1.6, 2.0, 2.1, Appendix M, 4.0, 4.1

Reading Assignment 2: 4.2, 4.3, (L.O., The Length of the Day), 4.5, 4.7

Reading Assignment 3: 2.2 (L.O., Astronomy around the World, Early Greek and Roman Cosmology, How do We Know Earth is Round?, Ptolemy's Model of the Solar System), 2.4, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5

Reading Assignment 4: 6.0, 6.1, 6.2(L.O., The Resolution of a Telescope, How Astronomers Really Use Telescopes), 6.5, 5.0, 5.1, 5.2, 6.3 (Infrared Observations)

Reading Assignment 5: 5.3, 1.8, 5.4, 5.5, 5.6

Reading Assignment 6: 7.0, 7.1, 7.2, 9.3(L.O., The Cratering Process, Using Crater Counts), 8.5(L.O., Where are the Craters on Earth?), 10.1(L.O., Basic Properties of Venus and Mars), 10.3 (L.O., Surface Temperature on Venus), 10.5 (L.O., Channels and Gullies on Mars, Ancient Lakes and Glaciers, Climate Change on Mars), 11.2, 3.6(The Discovery of Neptune), 12.1, 12.4, 7.4, 14.3, 13.4 (The Kuiper Belt & The Oort Cloud), 21.4, 21.5

Reading Assignment 7: 8.1, 8.2 (L.O., Plate Tectonics), 8.4, 15.0, 15.1, 15.2 (L.O., Sunspots, The Sunspot Cycle), 17.0, 17.1(L.O., Luminosity, Apparent Brightness), 17.2(L.O., Color and Temperature), 19.0, 19.2, 17.3, 18.0, 18.4

Reading Assignment 8: 16.2, 16.3, 21.1(L.O., Molecular Clouds: Stellar Nurseries, The Birth of a Star), 21.2, 22.0, 22.1, 22.4, 23.0, 23.1, 23.2, 23.4, 23.5, 24.0, 24.5, 24.6

Reading Assignment 9: 1.7, 25.0, 25.1(L.O., Disks and Haloes), 25.4, 25.3, 28.4, 25.6, 26.0, 26.1, 26.2

Reading Assignment 10: 1.5, 28.0, 28.1(L.O., Spectra, Colors, and Shapes), 28.3(L.O., The Local Group), 26.5, 29.0, 29.1, 24.1, 24.2, 24.3(L.O., Deflection of Starlight), 29.2, 29.3(L.O., The First Few Minutes), 29.4, 29.5

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Week of	Reading(s)	Proposed Topic	Due/To Prepare for Class
8/24	Assignment 1	Introduction, Scientific Method	
8/31		Star Motions, Constellations	9/4/26 - Exploration Exercise Due
9/7	Assignment 2	Earth's Orbital Motion, The Ecliptic, Path of the Sun	9/9/26 - Checkpoint 1
9/14		Seasons, Lunar Phases 1	
9/21		Lunar Phases 2, Eclipses	9/23/26 - Exam 1 9/23/26 - Extra Credit 1 Due
9/28	Assignment 3	Historical Astronomy Kepler's Laws of Planetary Motion	
10/5	Assignment 4	Newton's Laws Gravity	10/5/26 - Checkpoint 2
10/12	Assignment 5	Telescopes and Astronomy Light and Its Properties 1	
10/19		Light and Its Properties 2	10/19/26 - Checkpoint 3
10/26	Assignment 6	Solar System Astronomy	10/26/26 - Exam 2 10/26/26 - Extra Credit 2 Due
11/2	Assignment 7	Outer Solar System Astronomy Exoplanets	
11/9	Assignment 8	The Earth compared to other planets The Sun	11/13/26 - Checkpoint 4

11/16		The Luminosity of Stars The Temperature of Stars The H-R Diagram	
11/23	Assignment 9	Stellar Evolution The death of stars White Dwarfs, Neutron Stars, and Black Holes	11/23/26 - Exam 3 11/23/26 - Extra Credit 3 Due
11/30	Assignment 10	The Milky Way Galaxy Types of Galaxies The Expanding Universe	12/2/26 - Checkpoint 5 12/4/26 - Checkpoint 6 12/4/26 - Extra Credit 4 Due 12/4/26 - All other work due
12/7			12/7/26 - Monday, Final Exam - 5:30pm - 7:30pm

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.