

Introduction to Astronomy

Instructor: Richard S. Bell

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Fee: \$150/person

Recommended Ages: 15 years old & up

Meeting Times: Tuesdays & Thursdays beginning January 12th, 6:00 pm – 7:40 pm ET on Zoom

Textbook: *Horizons: Exploring the Universe* (14th edition) by Michael A. Seeds & Dana E. Backman

Welcome to Astronomy

Even though astronomy is the oldest of all the sciences, it is also the only one in which amateurs can perform world-class research. We live in an era of internet access, space-based telescopes, and fields as diverse as theoretical astrophysics and radio spectroscopy. Yet astronomy is still intimately connected to our most basic need; the quest to know where we fit in the great scheme of things. We have come to understand the basic rules of planetary motion and stellar evolution, explored new worlds, seen objects billions of light-years away, and still we strive to reach further. Moreover, we are lucky enough to live in a new Golden Age of Astronomy, where the blend of technology and mathematics has led us to a time when startling discoveries are made almost daily. But the journey is far from over. We still have much to learn about the universe, and this is the place to start. Welcome to astronomy!

About the Instructor

Richard has been a diehard amateur astronomer for more than 40 years. He is a lifetime member of the Kalamazoo Astronomical Society and the longest-serving president in the organization's history. He has degrees in Physics & Mathematics from Western Michigan University. Richard taught introductory-style astronomy courses for over 14 years at institutions like Albion College, Glen Oaks Community College, Kalamazoo Valley Community College, and Western Michigan University. Richard also ran taped and live programs for both the public and school groups at the Kalamazoo Valley Museum Planetarium for over 9 years and sold telescopes and related accessories for 6 years.

Class Philosophy

This is a class of personal enrichment. It is taught by an amateur astronomer, for amateur astronomers. It is not for those that need to fore fill a science credit, but for people that only care about enhancing their knowledge of the cosmos. As with any class there will be assignments to complete and exams to be taken, but no grades or credits will be given. I will not even take attendance! If you look up the answer to a question while taking an exam, for example, then you are only cheating yourself of the opportunity to be challenged and truly learning about the universe around us.

Class Schedule

Lectures will be held on Tuesdays & Thursdays from 6:00 pm – 7:40 pm (eastern time) on Zoom. Please see the back side of this syllabus for topics and reading assignments. Each lecture will be recorded and posted at a secret link on YouTube if you are unable to attend class during the scheduled time. Class starts promptly at 6:00 pm, so please logon at least a few minutes early.

Office Hours

I will be available for questions approximately 15 minutes before class and as long as necessary after class. We can also meet by appointment on either Zoom or Skype. You can always contact me via e-mail as well. I check it several times each day. Please feel free to contact me anytime with questions, comments, or concerns.

Chapter Questions

Most class meetings will have an accompanied set of questions to answer during the lecture. We will review them together as soon as the lecture has been completed.

Exams

There will be a total of four (4) exams during the course, one at the end of each section. They are composed of a mixture of multiple choice and diagrams. Exams will typically take less than one hour to complete. They must be completed by the dates indicated in the course schedule below. After that time, I will send out the answers so you can grade yourself. Study guides will be handed out before each lecture. These are to be completed on your own time. There is no comprehensive Final Exam.

Observing Assignments

Each student will be asked to complete two observation programs before the end of the course. Instructions for how to complete the assignments will be covered during the first week of classes. It will include the necessary materials (i.e. star maps) and information needed to complete the observations on your own time. We will also cover how to check your observations as you progress through the assignments.

Grades

If you want to give yourself a grade for this course, you can use the standard 70% (C) / 80% (B) / 90% (A) grading scale. Grades can be calculated using the following formula:

Exams	100 points each (×4)	400 points
Chapter Questions	10 points each (×21)	210 points
Observing Assignments	100 points each (×2)	<u>200 points</u>

Total: 810 points

Course Syllabus

This is the scheduled sequence of topics covered in the astronomy course. I reserve the right to adjust the schedule should any conflicts arise, however, we will pretty much stay on track as annotated below. If you are unable to attend class, you are still responsible for the material covered during your absence.

<u>Date</u>	<u>Section(s)</u>	<u>Topic</u>	<u>Date</u>	<u>Section(s)</u>	<u>Topic</u>
1/12	2.1 → 2.2	The Night Sky	2/23	13.1 → 13.3	Galaxies
1/14	3.1 → 3.3	Cycles of the Sky	2/25	13.4 → 13.5	Active Galactic Nuclei (AGN)
1/19	4.1 → 4.5	Copernicus to Newton	3/02	14.1 → 14.4	Cosmology
1/21	5.1 → 5.5	Light & Telescopes	n/a	n/a	EXAM #3 (take before 3/04)
n/a	n/a	EXAM #1 (take before 1/28)	3/04	15.1 → 15.3	Solar System Origin
1/28	6.1 → 6.3	Atoms & Spectra	3/09	16.1 → 16.3	Earth & Moon
2/02	7.1 → 7.3	The Sun – Our Star	3/11	17.1 → 17.3	Terrestrial Planets
2/04	8.1 → 8.6	Family of Stars	3/16	18.1 → 18.3	Jovian Planets
2/09	9.1 → 9.5	Formation & Structure of Stars	3/18	18.4 → 18.6	Ice Giants & Ice Dwarfs
2/11	10.1 → 10.4	The Deaths of Stars	3/23	19.1 → 19.2	Meteorites & Asteroids
2/16	11.1 → 11.3	Neutron Stars & Black Holes	3/25	19.3 → 19.4	Comets & Impacts
n/a	n/a	EXAM #2 (take before 2/18)	3/30	15.4	Extrasolar Planets
2/18	12.1 → 12.5	The Milky Way Galaxy	n/a	n/a	EXAM #4 (take before 4/01)