Astro 1040

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Fall
Year: 2025
Course Prefix: Astro
Course and Section #: 1040 001
Course Title: Elementary Astronomy
Credits: 3

Course Description

This course introduces astronomy and cosmology. It provides a physics-based overview of the solar system, the lives and deaths of stars, galaxies, and the evolution of the Universe. It explores the basic principles of physics and light, the tools of astronomy, and interesting concepts such as the Big Bang and black holes

Course Attributes

This course has the following attributes:
☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☒ Open Elective
Other: *Click here to enter text.*

Instructor Information

Instructor Name: Maureen Hintz

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Describe the process of science and tools by which astronomers gain knowledge about the universe, including how our understanding of the universe, its scale and our place in it has changed over time.
2. Make connections between the earth's daily and yearly motions and their experience of the sky, including positions and motions of celestial bodies, seasons, phases of the moon, and eclipses.
3. Recognize how underlying physical laws govern the formation and evolution of stars, planetary systems, galaxies, and the universe as a whole.
4. Apply basic principles of physics and light to the interpretation of astronomical observations and phenomena.
5. Identify scientific information conveyed in various forms, including simple equations, numbers, diagrams, charts, and graphs.
6. Answer conceptual questions with correct terminology in the fields of stellar astronomy, cosmology, and solar system science.

7. Apply concepts learned in the course to observations of the real night sky, current news and events, and representations of astronomy in the media and popular culture.

Course Materials and Texts

Mastering Astronomy Course Bundle (includes eText,of The Essential Cosmic Perspective, 9e, Mastering Astronomy Homework, Learning Catalytics)
Personal device that can access the internet during class (laptop, tablet, phone)

Course Requirements

Assignments:
Syllabus Quiz: 3% - quiz about the syllabus
Daily Check Your Neighbor: 17% - participation graded questions during class
Exploration Activities: 4% - inquiry based, participation graded activity during class
Daily Homework: 18% - assorted practice questions done outside of class
2 Observing Projects: 10% - activities done under the night sky
Media Experience 4% - watch and judge a non-fiction media about astronomy
5 Unit Exams: 30% - based on the sections of the class.
Professionalism Points: 4%
Final Exam: 10% - comprehensive exam

Final grades are rounded to the nearest tenth and assigned the corresponding letter grade.
A 94.0 -100.
A- 90.0 - 93.9
B+ 87.0 - 89.9
B 84.0 - 86.9
B- 80.0 - 83.9
C+ 77.0 - 79.9
C 74.0 - 76.9
C- 70.0 - 73.9
D+ 67.0 - 67.9
D 64.0 - 66.9
D- 60.0 63.9
F Below 60.0

Recommended Reading Assignments and General Subject for Each Day

Day		*Topics*	*Book Sections*
20-Aug	1	Class Introduction, Levels of the Universe	1.1
22-Aug	2	Stuff of the Universe/Celestial sphere	1.2
25-Aug	3	Celestial Sphere/Night Sky Definitions	2.1
27-Aug	4	Diurnal Motion	1.3, 2.1
29-Aug	5	Annular Motion	1.3, 2.2

1-Sep	xxxxxxxxx	Labor Day Holiday - no classes	
3-Sep	6	Precession	2.2
5-Sep	7	Lunar Phases and Eclipses	2.3
See Canvas for Dates		Test 1	
8-Sep	8	Exploration 1 - Celestial Mapping	Review 2.1
10-Sep	9	Motion of the Planets and Doing Science	2.4, 3.2
12-Sep	10	Doing Science cont.	3.3
15-Sep	11	Gravity - Newton and Einstein	4.2, 4.4, 14.3
17-Sep	12	Light	5.1
19-Sep	13	Light-Spectroscopy	5.2
22-Sep	14	Tools of Astronomy	5.3
See Canvas for Dates		Test 2	
24-Sep	15	Exploration 2- Stars	12.1
26-Sep	16	Nature of Stars	12.1
29-Sep	17	Nature of Stars (HR Diagram)	12.2
1-Oct	18	Birth of Stars	13.1
3-Oct	19	Fueling Stars - Sun	11.2
6-Oct	20	After the Main Sequence	13.2
8-Oct	21	After the Main Sequence, Death of Stars	13.2, 14.1
10-Oct	22	Death of High Mass Stars	13.3, 14.2
13-Oct	23	Neutron Stars and Black Holes	14.3
See Canvas for Dates		Test 3	
15-Oct	24	Milky Way	15.1, 15.4
20-Oct	25	Exploration 3 - Galaxies	16.1
22-Oct	26	Clusters, Distance and Time	16.2
24-Oct	27	Need for Dark Matter	18.1-18.3
27-Oct	28	Cosmology- Expanding Universe and Big Bang	17.1
29-Oct	29	Cosmology-Density of the Universe	17.2
31-Oct	30	Cosmology - Evidences for Big Bang	17.3
3-Nov	31	Cosmology Review	
See Canvas for Dates		Test 4	
5-Nov	32	Solar System Overview	6.1
7-Nov	33	Solar System Formation	6.2. 6.3, 6.4
10-Nov	34	Terrestrial Planets- Surfaces	7.2,7.3,7.4
12-Nov	35	Terrestrial Planets - Atmospheres	7.2,7.3,7.4
14-Nov	36	Exploration 4 - Eclipses	
17-Nov	37	Jovian Planets	8.1, 8.3

19-Nov	38	Moons of the Solar System	8.2
21-Nov	39	Small Bodies of Solar System	9.1-9.3
1-Dec	40	Exoplanets	10.1
3-Dec	41	Life	19.2, 19.3
See Canvas for Dates		Test 5	
5-Dec	42	Final Review	

Required Course Syllabus Statements

Generative AI

In this digital age you have nearly infinite resources at your fingertips, including internet search engines and Artificial Intelligence (AI). I encourage you to make use of these resources, but I include a warning that the first thing that pops up after a search or AI prompt may not be accurate. Do not accept the first thing you see as the answer. You need to investigate and make sure it is what you are actually searching for and corresponds to what you already know. You may also find other theories (models) to describe aspects of the universe that are different from what is presented in class. Homework correct answers will be based on the theories given in class and in the text accompanying our course.

Using Artificial Intelligence and Plagiarism:

AI programs are not a replacement for your human creativity, originality, and critical thinking. Writing, thinking, and researching are crafts that you must develop over time to develop your own individual voice. At the same time, you should learn how to use AI and in what instances AI can be helpful to you.

AI is **good** for:

- Brainstorming
- Finding information (you should confirm this yourself; errors are rampant. Go to the website it suggests.)
- Checking grammar, style, etc.
- Creating Images of your spaceship, etc.

AI **cannot** be used for:

- Writing your answers to the pre-class assignments. Please use your own voice.
- Doing your work for you including blindly answering homework
- Writing your Mission projects or
- Writing your conclusions and/or summaries (such as for your explorations, observing projects and media experience

Using Remote Testing Software

Select the box that applies.

☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic

honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX
Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office

for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.

To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.