

Astronomy 100 – Unveiling The Universe

Syllabus

Fall 2023

COURSE INFORMATION

Course Name:	Astronomy 100 – Unveiling the Universe (3 credit lecture + lab)
Course Schedule:	Lectures Monday & Wednesday; 10:00–10:50 a.m. Laboratory On-line
Prerequisites:	High school algebra and geometry or consent of instructor.
Required text:	<i>Astronomy</i> , 2 nd edition. by Fraknoi, Morrison, and Wolff; Available via OpenStax at the following link: https://openstax.org/details/books/astronomy-2e
Materials:	Scientific or graphing calculator (required)

This course is a descriptive survey of astronomy for students with minimal background in mathematics and science. It is an encounter with ideas concerning the physical universe, from earth to intergalactic space. 2 hrs lec, 2 hrs lab per wk. You may not take both ASTR 100 and ASTR 311 for credit. Also, you may not take ASTR 100 for credit if you have already taken ASTR 205 or ASTR 206. (GEP: NSC; AAS: NW)

INSTRUCTOR INFORMATION

Name:	Dr. Aaron Steffen
Office:	381C
E-mail:	aaron.steffen@uwsp.edu
Office Hours:	Monday, Wednesday, & Friday; 9:00 – 9:50 a.m. (or by appointment)

Brief Biography: I am a native of Sheboygan, Wisconsin. I received a B.S. degree in Physics and Mathematics from UW-Eau Claire and my M.S. and Ph.D. in Astronomy from UW-Madison. Before moving into teaching I worked as a postdoctoral research scientist at both Penn State and NASA's Spitzer Science Center (located on Caltech's campus). I am interested in understanding the multi-wavelength properties and evolution of super-massive black holes in the centers of galaxies.

COURSE STRUCTURE

Lecture - I presume that everyone will attend all of the lectures (and labs, if applicable). I also presume that students will have read the relevant material from the textbook before each lecture. Students are responsible for any materials (notes, handouts, etc..) they may have missed due to an absence.

Date	Lecture Topic	Chapter
Sept 6	Introduction	
Sept 11	Science and the Universe	Chapter 1
Sept 13	Observing the Sky	Chapter 2
Sept 18	Earth, Moon, and Sky	Chapter 4
Sept 20	Radiation and Spectra	Chapter 5
Sept 25	Astronomical Instruments	Chapter 6
Sept 27	Other Worlds	Chapter 7
Oct 2	Earth as a Planet	Chapter 8
Oct 4	Cratered Worlds	Chapter 9
Oct 9	Earthlike Planets	Chapter 10
Oct 11	The Giant Planets	Chapter 11
Oct 16	Rings, Moons, and Pluto	Chapter 12
Oct 18	Comets and Asteroids	Chapter 13
Oct 23	Origin of the Solar System	Chapter 14
Oct 25	The Sun: A Garden Variety Star	Chapter 15
Oct 30	The Sun: A Nuclear Powerhouse	Chapter 16
Nov 1	Analyzing Starlight	Chapter 17
Nov 6	The Stars: A Celestial Census	Chapter 18
Nov 8	Celestial Distances	Chapter 19
Nov 13	The Birth of Stars	Chapter 21
Nov 15	Stars from Adolescence to Old Age	Chapter 22
Nov 20	The Death of Stars	Chapter 23
Nov 22	Black Holes and Curved Spacetime	Chapter 24
Nov 27	The Milky Way Galaxy	Chapter 25
Nov 29	Galaxies	Chapter 26
Dec 4	Active Galaxies	Chapter 27
Dec 6	The Evolution of Galaxies	Chapter 28
Dec 11	The Big Bang	Chapter 29
Dec 13	Life in the Universe	Chapter 30
Dec 20	<i>Final Exam</i>	

Labs - Laboratory activities are designed to give students a hands-on experience with the concepts being covered in lecture. The experiments are designed to be completed in about two hours. The NAAP Labs are computer-based and the software can be downloaded at <http://astro.unl.edu/nativeapps/>.

Week of	Lab #	Laboratory Experiment (topic subject to change)
Sept 4–8	...	<i>No Lab; Download the software linked above.</i>
Sept 11–15	1	Basic Coordinates and Seasons
Sept 18–22	2	The Rotating Sky
Sept 25–29	3	Motions of the Sun
Oct 2–6	4	Lunar Phases
Oct 9–13	5	Hydrogen Energy Levels
Oct 16–20	6	Solar System Models
Oct 23–27	7	Planetary Orbits
Oct 30–Nov 3	8	Habitable Zones
Nov 6–10	9	HR Diagram
Nov 13–17	10	Extrasolar Planets
Nov 20–24	...	<i>No lab; Thanksgiving Break</i>
Nov 27–Dec 1	11	Eclipsing Binary Stars
Dec 4–8	12	Cosmic Distance Ladder
Dec 11–15	...	<i>No lab; Last week of classes</i>

Grading - Your final grade will be based on:

- Homework Quizzes – 140 points
- Laboratory Experiments – 240 points (if applicable)
- Midterm Exams (3) – 75 points (each)
- Comprehensive Final Exam – 200 points

The grading scale is as follows:

$93\% \leq A$	$80\% \leq B- < 83\%$	$67\% \leq D+ < 60\%$
$90\% \leq A- < 93\%$	$77\% \leq C+ < 80\%$	$63\% \leq D < 67\%$
$87\% \leq B+ < 90\%$	$73\% \leq C < 77\%$	$60\% \leq D- < 63\%$
$83\% \leq B < 87\%$	$70\% \leq C- < 73\%$	F < 60%

Homework - Online homework quizzes will be assigned each week. They will test your knowledge and understanding of the assigned reading for a given week's lectures. Quizzes are individual, not group, activities.

Exams - There will be three mid-term exams in addition to a comprehensive final exam. The mid-term exams are online, one-hour, open-textbook, open-note exams. Exams are individual activities.

Final Exam - The final exam is scheduled for December 20th. This will be a two-hour comprehensive final exam. The final exam is an in-person, paper-based exam. The final is closed-book, closed-notes, no internet access.

CLASSROOM CONDUCT

To make the classroom environment more conducive to learning the following list of rules will be enforced in all lectures and labs.

Talking - Questions for the instructor are always encouraged. In lecture, asking a neighbor a quick question to clarify a point made in class is acceptable, conversations unrelated to the course material are not. In lab (and in any peer activities in lecture) discussions are encouraged, but please try to stay on-topic as a courtesy to your neighbors.

Eating/Drinking - Small snacks and drinks will be initially allowed in the classroom. Large meals (subs, burgers, pizza, etc..) are not permitted. Each student is responsible for properly disposing of all trash and cleaning any mess they may make. If abused, this privilege will be revoked.

Cell phones - The use of cell phones is not permitted in class. This includes talking, texting, surfing, blogging, and twittering. If you require an exception to this cell phone ban (volunteer firefighter, expectant father, undercover CIA operative, etc..) you must let me know before the start of class. If you forget to turn off your cellphone and it rings in class, you are expected to turn it off at that time. If your cell phone rings again during the same class you will be asked to leave for the remainder of class.

Laptops - Laptops will be permitted in lecture for taking notes, but students are asked to refrain from using software that may distract themselves or others. Please do not e-mail, blog, use Twitter (or 'X'), Threads, Facebook, Snapchat, Tiktok, or Instagram, browse or search for unrelated content, or play games during class.

MISCELLANEOUS ITEMS

Academic Misconduct - It is each student's responsibility to know the University of Wisconsin System's policy on Academic Misconduct. Any cheating will invoke disciplinary action. You can download and review the policy from the following website:

<http://www.legis.state.wi.us/rsb/code/uws/uws014.pdf>