

Astronomy 100
Unveiling the Universe
Fall 2020

Lecture: Online/Asynchronous on Canvas

Lab: Online

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Zoom Office Hours:
M 12-2:45, T 10-1
Th 9-11 F 10-12
See Below for more Info

Text

Essential Cosmic Perspective 7th Edition by Bennett, available from the bookstore
Lab Manual material: Distributed on Canvas
Copies of Lectures, Lab Introductions, videos, and assignments and their solutions will make their way to Canvas

Office Hours

Faculty are here to help you! I have office hours. This semester they will held via Zoom. Office hours will be posted on our Course Canvas site. If these times don't work, we can set up a separate meeting. During office hours, I wait for questions. Feel free to come in and ask anything, including questions ranging from "I don't get it," to "How exactly does thermonuclear fusion work?" and everything in between. You are also free to ask questions about anything else you find interesting in science. But I suspect most questions will be about lab and homework. Remember, if this stuff was easy, we would just give you a book and a test 15 weeks later, but its not easy, so we are here to help you through it, that is why it is a college course.

Zoom Office Hour Links, ID's, and Passcodes

Monday 1:00- 2:45

Link: <https://uwsp.zoom.us/j/97546921642?pwd=eW1DMW1WRFRuZ0d6N1RHZGlvUjJ6UT09>

Meeting ID: 975 4692 1642

Passcode: 716331

Tuesday 10-1

Link: <https://uwsp.zoom.us/j/98583490750?pwd=MzNDVldyd0F1TnJsYks0NjF2VFM2dz09>

Meeting ID: 985 8349 0750

Passcode: 579757

Thursday 9-11

Link: <https://uwsp.zoom.us/j/92960662369?pwd=a0VtL2NTaURiazNLYWgrRFBwQmU4dz09>

Meeting ID: 929 6066 2369

Passcode: 709648

Friday 10-12

Link: <https://uwsp.zoom.us/j/91504701592?pwd=ZDdSUU9BdWNOWXdHN045anpHUFBOdz09>

Meeting ID: 915 0470 1592

Passcode: 506180

Organization of Material

Unit 1 – Motions in The Sky

Unit 2 – The Solar System and Planets

Unit 3 – The Sun and Stars

Unit 4 – Galaxies (shorter)

University General Education Program (GEP) Learning Outcomes

Below each GEP learning outcome is a bulleted sample list of items we will cover in the course. This list shows how this specific course is aligned with the GEP learning outcomes (in bold).

- **Explain major concepts, methods, or theories used in the natural sciences to investigate the physical world.**
 - Explain how Astronomers scientifically determined the following:
 - Structure of the Solar System (Geocentric vs. Heliocentric)
 - Formation of the solar system/ moons
 - Composition and mass of the planets
 - Shape of the Milky Way Galaxy
 - Death of a Star
 - Expansion of the Universe

- **Interpret information, solve problems, and make decisions by applying natural science concepts, methods, and quantitative techniques.**
 - **Interpret information**
 - Observe the motion of celestial objects (stars, planets, moon and sun) in the sky and determine the general pattern of motions based on: a) latitude of the observer on earth and b.) season.
 - Determine the relative ages of neighboring planetary surfaces based both on cratering rate and the superposition of craters.
 - Describe how planets and moons are formed based upon their composition.
 - Explain how the carbon dioxide cycle helps determine the temperature of Earth, Venus, and Mars.
 - Use the HR diagram, and describe how a star's luminosity varies with color, temperature, and spectral classification.

- ...solve problems and make decisions by applying natural science concepts, methods, and quantitative techniques.
 - Use models to determine rise/set times of different objects (sun, moon, stars) and how the rise/set times vary by season or latitude, phase of the moon, or day by day variation.
 - Measure the mass of planet, star, or galaxy using Kepler's 3rd Law
 - Determine the age of a planetary surface based on crater counts and calibrated cratering densities.
 - Determine the age of a cluster of stars.
 - Determine the relative sizes (radii) of stars based on luminosity and temperature.
 - Describe how a star's size, color, temperature, and luminosity vary through its birth, time on the main sequence and its death

- Describe the relevance of some aspect of the natural science to their lives and society.
 - How can you use the sun, moon, or stars to tell time, or your location on earth?
 - Describe our place in the Solar System or Milky Way Galaxy?
 - What is the origin of the atoms in your body?
 - Explain why we have meteor showers?
 - When will the sun die?
 - What will happen to the Universe?
 - How do we know what we know?

Grading Overview

There are three areas for grading

1. Homework
2. Four Exams
3. Labs
4. Written Reflection

Summary of Grading Points

Written Reflection	20	3.3%
Homework	100	16.1%
Four Exams	400	64.5%
Labs	100	16.1%
Total	620 pts	

Grading Scale as a Percentage of Total Points

A	93-100
A-	90-92.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	77-79.9
C	73-76.9
C-	70-72.9

D	60-69.9
F	00-59.9

Examinations

Four examinations will be given during the semester. The dates of these exams have been listed on the tentative schedule. The midterm exams will each be worth 100 points. A small portion of the final exam will cover the material in the fourth section of the course and the majority will cover the main ideas from the entire course. The final exam will be worth 100 points. Missing any exam will earn a grade of 0 (zero). The exam will be available for a 24-hour period on Canvas, but you will only have 50 minutes to complete the exam once it starts. Most questions are multiple choice. A few questions will require a written response or drawing a diagram.

Homework

Homework will be given via Canvas. At the end of the semester, your homework score will be scaled to 100 points (which will be equivalent to the percentage of homework points earned). Note that homework is the easiest way to get 100 free points. You can work on the homework individually or with your classmates, but each person will submit their work individually. **Late Homework Policy:** Homework can be handed in late but with a penalty. The penalty is 25% of the maximum score.

Laboratory

Each laboratory will be graded out of 20 points. Part of the score will come from the work you perform with your group. The laboratory assignments will be available on Canvas. There will be a pre-recorded lab lecture to introduce the lab concepts that you will use to complete the lab. You will submit the work individually, but you are free to work on it with your classmates. At the end of the semester, your final lab score will be scaled to 100 points.

Written Reflection

One of the General Education Programing Learning Outcomes is, “**Describe the relevance of some aspect of the natural science to their lives and society.**” Your written assignment will be to “Describe the relevance of some aspect of astronomy to your life and/or society.” Your reflection needs to be at least 200 words, about two paragraphs. Details will come later in the semester. The assignment will be worth 20 points. It will be due by the last day of the semester.

Attendance: Since this is an online course, there is no attendance. The days of examinations are given in the schedule below. The exam will be available for a 24-hour period, but you will only have 50 minutes to complete the exam once it starts. If you cannot take the exam on the day scheduled, you must have an excused absence. Excused absences include a death in the immediate family, an illness with a note from a doctor, PA, NP, or Health Services, a conflict with religious observances, or an event where you officially represent the University of Wisconsin – Stevens Point (i.e. sporting events,

artistic events) and the event directly conflicts with the test. **All excused absences must be approved before the day missed with appropriate documenting materials.** All unexcused absences will automatically earn a grade of zero (0).

In accordance with the University of Wisconsin policy, any potential conflict between class work and religious observances must be made known to the instructor within the first two weeks of class. The student must notify the instructor of the specific days and dates of specific religious observances for which the student seeks relief from academic requirements.

Tutoring

The Tutoring-Learning Center (TLC) offers free group, drop-in, and individual tutoring to support you in your astronomy class. The tutors are UWSP students who have done well in their classes and who are here to share their successful study habits and content knowledge to help others succeed. Reviewing, discussing, and practicing concepts together clarifies and solidifies knowledge, and the tutors are eager to study with you. If you have questions about the schedules or would like to make an appointment, please contact the TLC via email (tlctutor@uwsp.edu) or phone (715-346-3568) for information.

Math and Science Tutoring – Fall 2020

What	Details	Schedule	Cost
Drop-In Tutoring	Via Zoom	https://www.uwsp.edu/tlc/Pages/dropInTutoring.aspx	Free
One-on-One Tutoring	By appointment, via GoBoard. Weekly attendance required.	Complete online request form here: https://www.uwsp.edu/tlc/Pages/request-math-science-tutoring.aspx	Free

Tentative Schedule

Wk.	Dates	Lecture Topic	Lab Titles for the Week
1	9/2	Intro	No Lab
2	9/8	Motions of the Stars/Rotating Earth Model	Lab 1: The Sky from Stevens Point
3	9/14	Rotating Earth/Celestial Sphere	Lab 2: Daily Motions in the Sky Around the Globe
4	9/21	Ecliptic/ Tilt of the Earth	Lab 3: Phases of the Moon
5	9/28	Scientific Theories of the Solar System	Lab 4: Mass of Jupiter
6	10/5	Scientific Theories (Exam on Thursday)	Lab 5: Planetary Cratering
7	10/12	Formation of the Solar System/Extra Soar Planets	Lab 6: Telescopes
8	10/19	Earth Interior/ Formation of Atmosphere/Interior Planets	Lab 7: Inner/ Outer Planets Video
9	10/26	Outer Planets, Moons and Rings	Lab 8: Observing Spectra
10	11/02	Sun (Exam on Thursday)	Lab 9: Stars and Nebula
11	11/09	Characterizing Stars	Lab 10: Star Video
12	11/16	HR Diagram	Lab 11: Morphology of Galaxies
13	11/23	Stellar Evolution, Death of a Star (Thanksgiving Week)	Thanksgiving – No Lab
14	11/30	Galaxies (Exam Thursday)	Lab 12: Hubble's Law
15	12/07	Milky Way	No Lab

Final Exam – Wednesday Dec 16, 2020 - Complete a 120 minute exam on this day

Squares

