

ASTRONOMY 100 – 01

Unveiling the Universe

Spring 2022
Sections L1, L2, L3, L4

Instructor: Dr. Adriana Durbala
B-203 SCI Bldg.
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Office Hours:

Monday 2:00 –4:00 p.m.
Tuesday 12:00 –1:00 p.m.
Thursday 10:00 – 11:00 a.m. & 12:00 –1:00 p.m.

The purpose of the office hours is to allow students to ask any kind of questions related to Astr100 (lectures, labs, homework, exams, etc.) or Astronomy in general. If your schedule conflicts with all listed time intervals, I am also available by appointment; you would have to send me an email or call me and we can decide accordingly.

Meeting rooms/times:

Lecture (**D101 SCI**) – Monday and Wednesday 1:00-1:50 p.m.

Lab (**B204 SCI**): Section L1 – Tuesday 9:00 – 10:50 a.m.
Section L2 – Monday 10:00 – 11:50 a.m.
Section L3 – Friday 10:00 – 11:50 a.m.
Section L4 – Wednesday 10:00 – 11:50 a.m.

ASTR 100. Unveiling the Universe. 3 cr. 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 100 and 311 for credit. Also, you may not take 100 for credit if you have already taken 205 or 206. GDR: NS; GEP: NSC

Course website: Canvas <https://www.uwsp.edu/canvas/Pages/default.aspx>
<https://uwsa.instructure.com/courses/480462>

Log on using your UWSP login and password. ***This website will be used for posting grades, lecture and lab notes/videos, homework assignments, laboratory assignments, study guides, practice problems, and, very importantly, class announcements; for example, change of due dates for assignments, comments on a homework problem, exam dates, etc.***

Textbook: *The Cosmic Perspective (9th Ed.) by Bennet, Donahue, Schneider & Voit*
(available at the campus bookstore through the UWSP Text Rental program)

Other required materials: *a portable scientific calculator (graphing capabilities not needed)*

Tutoring:

The STEM Tutoring Program offers **FREE** tutoring to support you in your STEM classes. 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. Discussing concepts and practicing problems 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 visit us in ALB 018 (library basement), email (tlctutor@uwsp.edu), or call (715) 346-3568.

STEM Tutoring – Spring 2022

| What | Location | Schedule | Cost |
|--------------------------|------------------------|---|------|
| STEM Drop-In Tutoring | CBB 190 | No appointment needed – stop by when tutors are available: https://www.uwsp.edu/tlc/Pages/dropInTutoring.aspx | Free |
| STEM One-on-One Tutoring | ALB 018 or Virtual* | By appointment. Complete online request form here: https://www.uwsp.edu/tlc/Pages/Mathandscischedules.aspx | Free |

* Availability of virtual tutoring appointments may be limited

Course Learning Outcomes:

Upon completing this course, students will be able to:

- Develop a sense of scale in space and time pertinent to the Universe as a system.
- Understand the historical development of Astronomy as a science and genuinely grasp the scientific approach in acquiring knowledge.
- Explain major concepts, methods, or theories used in the natural sciences to investigate the physical world.
- Put the objects of study (planets, stars, galaxies, etc.) into a larger perspective: formation, evolution, and interactions.
- Understand phenomena and describe their relevance to our lives and society; e.g., seasons, eclipses, tides, keeping track of time, etc.
- Humbly appreciate the fragility of the Earth's ecology
- Interpret information, solve problems, and make predictions/decisions by applying natural science concepts, methods, and quantitative techniques.
- Describe the relevance of aspects of the natural sciences to their lives and society.

Attendance:

Lecture attendance is **strongly recommended**. It is extremely important to an effective learning process. Although the lecture slides are available on the course website, they are not necessarily complete. They are meant only as an outline of a particular subject. Not everything that we talk about in classroom is on the slides and what is on the slides is not always self-explanatory. Attending class will likely be the single most important factor in determining your performance and grade in the course, so plan to attend every class. The relationship between attendance and achievement in education has been extensively documented in peer-reviewed research. **The material cannot be re-taught to you in the event that you are absent, but you can ask a classmate to share notes.**

All scheduled exams will be “in-class” (no take-home exams) and they are all mandatory.

Laboratory attendance is **mandatory**. The laboratory is an integral part of the Astronomy 100 course. A missed lab will automatically bring a zero contribution to the corresponding lab grade. **Failing the lab component of the class (scoring below 60%) will result in a failing grade for the ENTIRE Astr100 course.**

In case of potential time conflict between a scheduled exam or a lab and religious observances, the student must bring this to the instructor's attention within the first three weeks of the semester, according to the policy of the University.

If you decide to drop a class, please do so using accesSPoint or visit the Enrollment Services Center. Changes in class enrollment will impact your tuition and fee balance, financial aid award and veterans' educational benefit. During the first eight days of the regular 16-week term, your instructor will take attendance. If you are not in attendance, you may be dropped from the class. You are responsible for dropping any of your enrolled classes.

- If you must be absent during the term, tell your instructor prior to the class you will miss. If you cannot reach your instructor(s) in an emergency, contact the Dean of Students Office at 715-346-2611 or DOS@uwsp.edu.
- If you are dropped from a class due to non-attendance, you may only be reinstated to the class section using the class add process. Reinstatement to the same section or course is not guaranteed. Your instructors will explain their specific attendance policies to be followed at the beginning of each course.
- If you take part in an off-campus trip by an authorized university group such as an athletic team, musical or dramatic organization, or a class, make appropriate arrangements in advance with the instructor of each class you will miss. If you are absent from classes because of emergencies, off-campus trips, illness, or the like, your instructors will give you a reasonable amount of help in making up the work you have missed.
- If you enroll in a course and cannot begin attending until after classes have already started, you must first get permission from the department offering the course. Otherwise, you may be required to drop the course.
- If you do not make satisfactory arrangements with your instructors regarding excessive absences, you may be dismissed. If you are dismissed from a class, you will receive an F in that course. If you are dismissed from the University, you will receive an F in all enrolled courses.

Grading Policies:

You will have the following contribution to your final grade:

Laboratory work 22%

Three midterm exams each 15%

Final exam 20%

Homework 10%

Observing Project 3%

TOTAL: 100%

Your current grades will be updated typically every week on the class website (Canvas). If you have any questions about the listed grades or if you see any errors, please contact us immediately.

The final letter grade will be assigned according to the following scale:

| | | |
|----------------|----------------|-------------------|
| A → 93-100% | A- → 90-92.99% | |
| B+ → 87-89.99% | B → 83-86.99% | B- → 80-82.99% |
| C+ → 77-79.99% | C → 73-76.99% | C- → 70-72.99% |
| D+ → 67-69.99% | D → 60-66.99% | F → less than 60% |

Laboratory work: Lab reports consist of two parts. There is a pre-lab assignment for each lab exercise (starting with Lab 1). The pre-lab for the following week will be handed out in lab the week before. This pre-lab assignment must be turned in at the start of the lab. Pre-lab assignments will only be accepted if the student attends lab and only if they are turned in at the start of class. **Late pre-lab assignment will not be accepted, nor will they be accepted if the student does not attend the lab.** The main part of the exercise is done in class. The pre-lab assignments and the in-class labs will account for 22% of the final grade. **The lowest lab grade will be dropped at the end of the semester.**

In order to get credit for lab work, attendance is mandatory (I emphasize that one major objective of the lab is to allow you to develop group-working skills). You do not get any credit if you do not attend the lab or if you are more than 15 minutes late. **Each lab report is due at the end of the laboratory class.** If a lab is missed for any reason, that lab will be the one dropped when calculating the lab grade. Even if a lab is missed, the student is responsible for any material covered in that lab. If you know of any absence ahead of time, please contact me so we can try to accommodate you into another lab section that same week. **There are no make-up labs!**

Students may not attend another lab section without prior permission from the instructor.

Midterm Exams: There will be *three* midterm exams during the semester. They will be given during the regular lecture time, as noted in the course outline (tentative schedule). The dates are subject to change, as announced in class. Each midterm is worth 15% of your final grade and is based on the material covered in lecture, labs, and homework over the past weeks. There will be an optional practice quiz in Canvas available one week before every exam.

Final exam: A **comprehensive/cumulative** final exam will be given during finals week as noted in the course attached schedule. It is worth 20% of your final grade.

*There are no make-up exams. In the case of an unfortunate event (illness, death in the family, accident, etc.) please contact me **before the exam** (if at all possible) so that we could make proper arrangements. It is your responsibility to provide the instructor with a valid doctor excuse for any illness that prevents you from fulfilling the requirements of this class.*

Notes: 1) **The lowest grade of the three midterm examinations will be replaced by the grade of the final exam (preserving the predefined contribution of 15%). This will be done only if the final exam grade is greater than the lowest grade of all three midterms. However, if you miss a midterm, this rule does not apply (a zero will not be replaced by the final exam grade!!!). Only one midterm grade can be replaced!**

2) **The exams will consist of multiple-choice questions.**

Homework: The homework assignments will be posted on Canvas under Home→Homework Assignments almost every week. Homework assignments will be **submitted online** by the due date/time (usually by Thursday at 11:59 pm). Each homework will be available for a week with no time limit. See the tentative schedule at the end of the Syllabus for due dates. **No homework will be accepted after the indicated due date/time. The lowest grade of all homework assignments will be dropped.** All homework will account for 10% of your final grade.

Observing project: An observing project will be assigned at the beginning of the semester; it is worth 3% of your final grade. Details are provided on the last page of the syllabus.

Bonus questions (Optional – Extra-Credit): Questions will be asked periodically during lecture. All bonus questions will account for a maximum of 3%. The bonus quizzes will be available through Canvas.

Bonus points come on top of all other contributions. In other words, bonus questions can only boost, not lower your grade by any means.

Suggestions for Studying:

1. Attend lecture and lab regularly.

The tests are predominantly based on lecture, lab and homework material. If a particular subject has not been taught/lectured, it will not be on the test. We will often lecture around a picture or slide, and you are responsible for material discussed in class even if it is not written out on the slide. The in-class bonus questions not only allow you to get bonus points, but they also offer you examples of questions reasonably similar to those that you'll see on exams.

2. Study regularly.

There is a lot of material covered, most of it probably a complete novelty. The course builds up sequentially and adds a substantial number of new terms to your vocabulary. It is more and more difficult to keep up with the flow of the course if you do not grasp the new concepts as they arise. Postponing study for the night before an exam rarely pays off.

3. Take advantage of the office hours and tutoring (available through TLC).

Do not hesitate to ask us any kind of questions related to the lecture, labs, homework or any other subject related to Astronomy.

4. Try to attend actively. Take organized notes during lectures and try to keep your mind connected to the subject that is presented. **All** members of a team should actively engage in the laboratory exercises.

5. Do the practice questions provided online (on the course website)

6. Find someone in the class to study with.

Get to know your classmates well enough so that you can ask for lecture notes, get together to study for exams, etc.

Absences due to Military Service

You will not be penalized for class absence due to unavoidable or legitimate required military obligations, or medical appointments at a VA facility, not to exceed two (2) weeks unless special permission is granted by the instructor. You are responsible for notifying faculty members of such circumstances as far in advance as possible and for providing documentation to the Office of the Dean of Students to verify the reason for the absence. The faculty member is responsible to provide reasonable accommodations or opportunities to make up exams or other course assignments that have an impact on the course grade. For absences due to being deployed for active duty, please refer to the <https://www.uwsp.edu/veteran-services/Pages/Call-Up-Guidelines.aspx> .

Equal Access for Students with Disabilities:

Students with special needs should contact the Office of Disability Services as soon as possible (<http://www.uwsp.edu/disability/Pages/default.aspx>) in order to request suitable accommodation. UW-Stevens Point will modify academic program requirements as necessary to ensure that they do not discriminate against qualified applicants or students with disabilities. The modifications should not affect the substance of educational programs or compromise academic standards; nor should they intrude upon academic freedom. Examinations or other procedures used for evaluating students' academic achievements may be adapted. The results of such evaluation must demonstrate the student's achievement in the academic activity, rather than describe his/her disability.

If modifications are required due to a disability, please inform the instructor and contact the Disability and Assistive Technology Center to complete an Accommodations Request form. Phone: 346-3365 or Room 609 Albertson Hall.

Religious Beliefs Accommodation

It is UW System policy to reasonably accommodate your sincerely held religious beliefs with respect to all examinations and other academic requirements.

You will be permitted to make up an exam or other academic requirement at another time or by an alternative method, without any prejudicial effect, if:

- There is a scheduling conflict between your sincerely held religious beliefs and taking the exam or meeting the academic requirements; and

- You have notified your instructor within the first three weeks of the beginning of classes (first week of summer or interim courses) of the specific days or dates that you will request relief from an examination or academic requirement.

Academic Honesty: Students are expected to maintain the highest standards of academic integrity. Common examples of misconduct include but are not limited to: copying the homework from others, looking at notes while taking an exam, talking to others while taking an exam. Just to avoid the embarrassment and severe consequences of misconduct it is strongly advised that if you need some clarification during an exam or while working on homework, you should ask the instructor/proctor for help. More information on your rights and responsibilities are available at: http://docs.legis.wisconsin.gov/code/admin_code/uws/14.pdf

UWSP 14.01 Statement of principles

The board of regents, administrators, faculty, academic staff and students of the University of Wisconsin system believe that academic honesty and integrity are fundamental to the mission of higher education and of the University of Wisconsin system. The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors.

UWSP 14.03 Academic misconduct subject to disciplinary action.

Academic misconduct is an act in which a student:

- (a) Seeks to claim credit for the work or efforts of another without authorization or citation;
- (b) Uses unauthorized materials or fabricated data in any academic exercise;
- (c) Forges or falsifies academic documents or records;
- (d) Intentionally impedes or damages the academic work of others;
- (e) Engages in conduct aimed at making false representation of a student's academic performance; or
- (f) Assists other students in any of these acts.

Help Resources

| Tutoring | Advising | Safety and General Support | Health |
|--|---|--|--|
| Tutoring and Learning Center helps with Study Skills, Writing, Technology, Math, & Science. 018 Albertson Hall, ext 3568 | Academic and Career Advising Center, 320 Albertson Hall, ext 3226 | Dean of Students Office, 212 Old Main, ext. 2611 | Counseling Center, Delzell Hall, ext. 3553. Health Care, Delzell Hall, ext. 4646 |

UWSP Service Desk

The Office of Information Technology (IT) provides a Service Desk to assist students with connecting to the Campus Network, virus and spyware removal, file recovery, equipment loan, and computer repair. You can contact the Service Desk via email at techhelp@uwsp.edu or at (715) 346-4357 (HELP) or visit: <https://www.uwsp.edu/infotech/Pages/ServiceDesk/default.aspx>

In case of emergency:

In the event of a medical emergency call 9-1-1 or use Red Emergency Phone. Offer assistance if trained and willing to do so. Guide emergency responders to victim.

In the event of a tornado warning, proceed to the lowest level interior room without window exposure. See www.uwsp.edu/rmgt/Pages/em/procedures/other/floor-plans.aspx for floor plans showing severe weather shelters on campus. Avoid wide-span structures (gyms, pools or large classrooms).

In the event of a fire alarm, evacuate the building in a calm manner. Meet at DUC. Notify instructor or emergency command personnel of any missing individuals.

Active Shooter/Code React – Run/Escape, Hide, Fight. If trapped hide, lock doors, turn off lights, spread out and remain quiet. Call 9-1-1 when it is safe to do so. Follow instructions of emergency responders.

See UW-Stevens Point Emergency Procedures at www.uwsp.edu/rmgt/Pages/em/procedures for details on all emergency response at UW-Stevens Point.

Final note: Common courtesy dictates that students attending a class should remain seated for the duration of class. While in class students should refrain from using phones, music players, headphones, etc. and should also refrain from gossiping/chatting while the professor is lecturing, and other students are listening and taking notes.

Tentative Schedule—ASTR 100-01, spring 2022

| Week | Lecture topics | Textbook Chs. | Lab Ex. | Homework |
|-------------------------------|---|---------------|---|--|
| Jan 24-28 (Week 1) | What does Astronomy study, the modern view of the Universe A sense of scale in a Universe where all things are in motion. (Observing Project handed out) | 1 | Lab Introduction/ Planetarium (Lab 0) | HW 1 begins Thursday, January 27 |
| Jan 31 - Feb 4 (Week 2) | Celestial sphere, patterns, and motions in the sky. Seasons, early observations of planetary motions, Moon's phases, eclipses. | 2 | Planetarium visit/ Motions in the Sky (Lab 1) | HW 1 due/HW 2 begins Thursday, February 3 |
| Feb 7-11 (Week 3) | Ancient roots of science, ancient Greek science, Copernican revolution, Brahe and Kepler, Galileo. Astronomy as a science. | 3 | Celestial Globe (Lab 2) | HW 2 due/HW 3 begins Thursday, February 10 |
| Feb 14-18 (Week 4) | Describing motion with simple examples, mass and weight, conservation laws, tides. | 4 | Phases of the Moon (Lab 3) | HW 3 due/ HW 4 begins Thursday, February 17 |
| Feb 21-25 (Week 5) | MIDTERM 1 (Monday, Feb 21) | | Mass of Jupiter (Lab 4) | HW 4 due/ HW 5 begins Thursday, February 24 |
| | Basic properties of light. | 5 | | |
| Feb 28 - Mar 4 (Week 6) | Clues to how and when our solar system formed. Formation of our solar system | 7, 8 | Planetary cratering (Lab 5) | HW 5 due/ HW 6 begins Thursday, March 3 |
| Mar 7-11 (Week 7) | Other planetary systems Features and geology of the terrestrial planets. | 6, 9, 13 | Telescopes (Lab 6) | HW 6 due/ HW 7 begins Thursday, March 10 |
| Mar 14-18 (Week 8) | Features and geology of the terrestrial planets. (cont.) | 9, 10 | Planet Video (Lab 7) | HW 7 due/ HW 8 begins Thursday, March 17 |

| Mar 19-27 | Spring Break | | NO LABS this week | NO HW this week |
|------------------------------|--|----------------------------------|---------------------------------|--|
| Mar 28- Apr 1 (Week 9) | Jovian planets: structures, moons, and rings. MIDTERM 2 (Wednesday, Mar 30) | 11 | Observing spectra (Lab 8) | HW 8 due/ HW 9 begins Thursday, March 31 |
| Apr 4-8 (Week 10) | Asteroids, comets, and dwarf planets. Spectroscopy | 5, 12 | Stars video (Lab 9) | HW 9 due/ HW 10 begins Thursday, April 7 |
| Apr 11-15 (Week 11) | Properties of our Sun Solar cycle, Sun-Earth connection. | 14 | Stars and nebulae (Lab 10) | HW 10 due/ HW 11 begins Thursday, April 14 |
| Apr 18-22 (Week 12) | Measuring the properties of stars. Patterns among stars Star clusters | 15 | Photometry of Pleiades (Lab 11) | HW 11 due/ HW 12 begins Thursday, April 21 |
| Apr 25-29 (Week 13) | MIDTERM 3 (Monday, Apr 25) Evolution and death of low/high mass stars Stellar Remnants | 17, 18 | Morphology of galaxies (Lab 12) | HW 12 due/ HW 13 begins Thursday, April 28 |
| May 2-6 (Week 14) | Milky Way Galaxy A universe of galaxies | 19, 20 | Hubble's Law (Lab 13) | HW 13 due/ HW 14 begins Thursday, May 5 |
| May 9-13 (Week 15) | Measuring distances in the Universe Introduction to cosmology; the Big Bang Model Review Session Observing Project due Wednesday, May 11 | 20 | NO LABS this week | HW 14 due Thursday, May 12 |
| May 18 | FINAL EXAM – Sections L1-L4 Wednesday, May 18th 2:45-4:45 p.m. (D101 SCI) | <u>Comprehensive/ Cumulative</u> | | |

OBSERVING PROJECT

You will be required to visit the observatory on campus at least once during the semester. The observatory opens for the spring semester on Monday, January 31. When you go there, the student in charge will have you view at least two astronomical objects through the telescope. **There will be an observing report form available at the observatory. After viewing the objects, the student on duty will put two stickers on your observing report form (one for each object viewed). Fill out the form and return to me by the last day we have a scheduled lecture (see the tentative schedule above).**

The observatory is normally open Monday, Tuesday, and Wednesday evenings from 8:30-10 pm if the skies are clear (please check the website http://www.uwsp.edu/physastr/plan_obs/Pages/observatory.aspx). If the skies are cloudy, the observatory will be closed, and you need to go another time.

I would advise you to go as early as possible since the weather is very unpredictable, and I cannot guarantee that you'll have clear weather in the last few weeks of the semester.

Location: The observatory is located on the roof of the Science building. You need to use the southwest stairwell in the Science building and go to the fourth floor, room D402. It is usually very cold in the observatory at night since the dome is open, so please dress appropriately.

You can also benefit from the Planetarium shows (the schedule is available at http://www.uwsp.edu/physastr/plan_obs/Pages/Public-Programs.aspx).