

ASTRONOMY 100– 02H

Unveiling the Universe

Fall 2018

Section L4 - Honors

Instructor:

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Office Hours:

Monday 2:00 – 3:00 p.m.
Tuesday 1:00 – 2:00 p.m.
Wednesday 2:00 – 4:00 p.m.
Friday 1:00 – 2:00 p.m.

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

Meeting rooms/times:

Lecture (D101 SCI) – Monday and Wednesday 11:00-11:50 a.m.
Lab (B204 SCI): Section 4H – Thursday 2:00 – 3:50 p.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

Tutoring: Tutoring-Learning Center (TLC) might offer free group tutoring for ASTR100. The schedule can be found at <http://www.uwsp.edu/tlc/Pages/schedules.aspx>. Times and locations will be listed by Week 2 of the semester. Group Tutoring begins Week 3. TLC also offers one-on-one tutoring (available by appointment only). Go to room ALB 018 (library basement) if you would like to request one-on-one tutoring.

The Department of Physics and Astronomy has also a tutoring room. It is located at A105 SCI. About the second week of class a schedule will be posted on the door (see also <http://www.uwsp.edu/physastr/Pages/Tutoring.aspx>). This service is free of charge and by walk-in (Only some tutors may be qualified to provide tutoring for ASTR 100).

Textbook: *The Essential Cosmic Perspective (7th Ed.)* by Bennet, Donahue, Schneider & Voit

Supplemental readings: *provided by the instructor during the semester.*

Other required materials: *a portable scientific calculator (graphing capabilities not needed) and a **clicker** for in-class exercises (leasing and code-purchasing instructions below).*

Course website: <http://www.uwsp.edu/d2l/Pages/default.aspx>

Log on using your UWSP login and password. ***This website will be used for posting grades, lecture and lab notes, 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.***

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.

General Education Program Learning Outcomes – Natural Sciences:

Upon completing this course, students will be able to:

- Explain major concepts, methods, or theories in the natural sciences to investigate the physical world.
- Interpret information, solve problems, and make decisions by applying natural science concepts, methods, and quantitative techniques.
- Describe the relevance of aspects of the natural sciences to their lives and society.

Note: Because this is an *Honors* section, this class will also:

- emphasize written and oral communication skills, information literacy, and discussion
- foster collaboration
- utilize sources beyond the textbook
- include assignments that require students to synthesize materials of varying perspectives.

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. **I am not able to re-teach the material to you in the event that you are absent, but you can ask a classmate to share notes.**

I will submit an attendance report to the registrar at the end of the second week of classes and constantly update the “attending” status of each student as we advance through the semester.

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 myPoint 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 23%
In-class discussion 2%
In-class presentations 3%
Three midterm exams each 13%
Final exam 14%
Homework 13%
Observing project 2%
Written project 4%

TOTAL: 100%

Your current grades will be updated typically every week on the class website (D2L). If you have any questions about the listed grades or if you see any errors, please contact me 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: Every week the instructor will provide you with a hardcopy of the lab exercise. Lab reports consist of two parts. There is a pre-lab assignment for each lab exercise. The pre-lab assignment will be handed out in class one week before the assignment is due. This 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

23% of the final grade. **The lowest lab grade will be dropped.** Some pre-lab assignments will require supplemental readings (provided by the instructor) beyond the textbook.

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!**

In-class discussion: In-class 50 minute discussion on an article from the *Astronomy, Sky & Telescope magazines, or Journal for the History of Astronomy* (see tentative schedule). It is worth 2% of your final grade.

In-class presentations: Each student will give a 5-minute presentation on a recent discovery in the field of Astronomy (see tentative schedule). That will be followed by a 5-minute Q & A discussion. Details will be provided later in class during the semester. It is worth 3% of your final grade.

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 13% of your final grade and is based on the material covered in lecture, labs, and homework over the past weeks.

Final exam: A **comprehensive/cumulative** final exam will be given during finals week as noted in the course attached schedule. It is worth 14% 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 me 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 13%). 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 exam, 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 be a combination of multiple-choice and questions that require a written answer.**

Homework: I will hand out a homework assignment on paper, in class, every week. I will announce in classroom the homework due date/time. Homework assignments will be **turned in in class the following week. 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 13% of your final grade. Some homework assignments will require supplemental readings (provided by the instructor) beyond the textbook.

Observing project: An observing project is assigned at the beginning of the semester; it is worth 2% of your final grade. It will require a visit at the observatory atop the science building. Details are provided on the last page of the syllabus.

Written project: The project will be worth 4% of your final grade. The guidelines for its completion will be handed out later in the semester after we will have introduced and explained several fundamental topics. The project will consist of a two-page report/essay that will require

students to synthesize materials of varying perspectives. It will be due the last day we have lecture this semester (see schedule).

Bonus questions using clickers: Questions will be asked frequently and you will answer using clickers (see below). All bonus questions will account for a maximum of 3%. All answers will be rewarded, the incorrect ones getting partial credit.

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

This class uses “Turning Point Cloud” to do interactive polling. You will need to purchase a *Turning Technologies* code from the bookstore to participate in the class interactive process. You will be required to check out a clicker from the **UWSP IT Service Desk** to respond to polling.

Check out of the clicker is at the **UWSP IT Service Desk in room 027 ALB, basement of the UWSP Library.** Device checkout is **free of charge.**

Returning clickers: Clickers must be returned to IT Service Desk before the end of finals. Students with unreturned clickers will be billed a late fee and/or may be billed the replacement cost of the clicker.

For Service Desk hours: <http://www.uwsp.edu/infotech/Pages/HelpDesk/default.aspx>

You will need your UWSP Student ID to get your clicker.

Turning Point Account

You will need to create a Turning Technologies account in order to register your device to the class. Please use your UWSP email address to create an account here:

<https://account.turningtechnologies.com/account/>

You can find help with Turning Point Cloud here:

<https://www.turningtechnologies.com/support/turningpoint-cloud>

Suggestions for Studying:

1. Attend lecture and lab regularly.

The tests are predominantly based on lecture, lab, and homework material. If I have not lectured about a particular subject, it will not be on the test. I 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.

Do not hesitate to ask me 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 (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 I would strongly advise 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, head phones, etc. and should also refrain from gossiping/chatting while the professor is lecturing and other students are listening and taking notes.

Tentative Schedule

Week	Lecture topics	Textbook Chs.	Lab Ex.	Homework
Sep 4-7	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	Planetarium visit	
Sep 10-14	Celestial sphere, patterns and motions in the sky. Seasons, early observations of planetary motions, Moon's phases, eclipses.	2	Motions in the Sky	HW 1 begins Thursday September 13
Sep 17-21	Ancient roots of science, ancient Greek science, Copernican revolution, Brahe and Kepler, Galileo. Astronomy as a science.	3	Planetarium/ Celestial Globe	HW 1 due/ HW 2 begins Thursday September 20
Sep 24-28	Describing motion with simple examples, mass and weight, conservation laws, tides.	4	Phases of the Moon	HW 2 due/ HW 3 begins Thursday September 27
Oct 1-5	MIDTERM 1 (Monday, Oct 1)		Mass of Jupiter	HW 3 due/ HW 4 begins Thursday October 4
	Basic properties of light. Clues to how and when our solar system formed.	5, 6		
Oct 8-12	Formation of our solar system Other planetary systems	6, 10	Planetary cratering	HW 4 due/ HW 5 begins Thursday October 11
Oct 15-19	Features and geology of the terrestrial planets.	7	Telescopes	HW 5 due/ HW 6 begins Thursday October 18
Oct 22-26	Jovian planets: structures, moons, and rings.	8	Planet Video In-class discussion	HW 6 due/ HW 7 begins Thursday October 25
Oct 29- Nov 2	Asteroids, comets and dwarf planets.	9	Observing spectra	HW 7 due/ HW 8 begins Thursday November 1
	MIDTERM 2 (Wednesday, Oct 31)			
Nov 5-9	Spectroscopy Properties of our Sun	5, 11	HR Diagram	HW 8 due/ HW 9 begins Thursday November 8
Nov 12-16	Solar cycle, Sun-Earth connection. Measuring the properties of stars.	11, 12	Stars video In-class presentations	HW 9 due/ HW 10 begins Thursday November 15
Nov 19-21	Patterns among stars Star clusters	12	No labs this week	No HW due this week
Nov 22-25	Student Vacation			

Nov 26-30	Evolution and death of low mass stars Evolution and death of high mass stars Stellar remnants MIDTERM 3 (Wednesday, Nov 28)	13, 14	Stars and nebulae	HW 10 due/ HW 11 begins Thursday November 29
Dec 3-7	Milky Way Galaxy A universe of galaxies	15,16	Morphology of galaxies	HW 11 due/ HW 12 begins Thursday December 6
Dec 10-14	Measuring distances in the Universe Introduction to cosmology; the Big Bang Model Review Session Observing Project due Dec 12 Written Project due Dec 12	16, 17	Hubble's Law	HW 12 due Thursday December 13
Dec 18	FINAL EXAM – Section L4H Tuesday, December 18th 10:15 a.m. -12:15 p.m. (D101 SCI)	<u>Comprehensive/</u> <u>Cumulative</u>		

ASTR 100 ONLINE PRACTICE QUIZZES INSTRUCTIONS

Here are a few general instructions about the practice quizzes. Please review these, but also read the instructions for the individual quizzes on-line (whenever the case).

1. Practice quizzes can be found at the course website <http://www.uwsp.edu/d2l/Pages/default.aspx> and going to the QUIZZES section. **Practice quizzes will be available one week before an exam.** The ***Practice Problems not graded*** are just that, problems posted for you to practice for the exams, but are not graded and although recommended, are not due at all.

2. ***Practice Problems*** are generated randomly from a large set of problems. Every time you access a practice test you may see new questions. Sometimes the homework lags behind the last chapter included in an exam, so these practice problems are a valuable resource for testing and reviewing your knowledge. Moreover, the exam could contain a good fraction of questions very similar to those available for practice.

OBSERVING PROJECT

You will be required to visit the observatory on campus at least once during the semester. The observatory opens for the fall semester sometime in mid-September. 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, fill out the form and have it signed by the student on duty, 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 (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. The observatory can be contacted to determine if it will be open and has clear skies from any touch-tone phone by calling 346-2208 and selecting the observatory option (number 6) from the automated attendant. The announcement for the evening is usually not recorded until sometime after 8:00 pm since the staff do not want to close unless absolutely necessary.

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).