ASTRONOMY 100
Unveiling the Universe

Spring 2018
Section 1 - Honors

Instructor: Dr. Adriana Durbala
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Meeting rooms/times:
Lecture (A109 SCI) **–** Tuesday and Thursday 12:00-12:50 p.m.
Lab (B204 SCI)**:** Section 1 – Wednesday 3:00 – 4:50 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

Office Hours:
I have scheduled five office hours weekly:

Monday 9:00 – 10:00 a.m.
Tuesday 10:00 – 11:00 a.m.
Thursday 10:00 – 11:00 a.m.
Friday 9:00 – 10:00 a.m. & 1:00 – 2:00 p.m.
(or anytime my office door is open)

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.

Tutoring: Tutoring-Learning Center (TLC) is offering **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.***

Learning Outcomes:

Upon completing this course, students will be able to:

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

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.

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.

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. **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. **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.

Disability Services:

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.

Academic misconduct: Students are expected to maintain the highest standards of academic integrity. Common examples of misconduct: copying the homework from others, looking at notes while taking an exam, talking to others while taking an exam. To avoid the embarrassment and severe consequences of misconduct I would strongly advice 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: https://www.uwsp.edu/dos/Pages/Publications.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
Jan 22-26	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 Intro to Units & Scientific Notation	
Jan 29-Feb 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	HW 1 begins Thursday February 1
Feb 5-9	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 February 8
Feb 12-16	Describing motion with simple examples, mass and weight, conservation laws, tides. Basic properties of light.	4, 5	Phases of the Moon	HW 2 due/ HW 3 begins Thursday February 15
Feb 19-23	**MIDTERM 1 (Tuesday, Feb 20)** Clues to how and when our solar system formed. Formation of our solar system	 6	Mass of Jupiter	HW 3 due/ HW 4 begins Thursday February 22
Feb 26-Mar 2	Other planetary systems Features and geology of the terrestrial planets.	7, 10	Planetary surfaces	HW 4 due/ HW 5 begins Thursday March 1
Mar 5-9	Jovian planets: structures, moons, and rings.	8	Telescopes	HW 5 due/ HW 6 begins Thursday March 8
Mar 12-16	Asteroids, comets and dwarf planets.	9	Planet Video **In-class discussion**	HW 6 due/ HW 7 begins Thursday March 15
Mar 19-23	**MIDTERM 2 (Tuesday, Mar 20)** Spectroscopy	 5	Observing spectra	HW 7 due/ HW 8 begins Thursday March 22
Mar 24-Apr 1	**Spring Break**		**No labs this week**	**No HW due this week**
Apr 2-6	Properties of our Sun Solar cycle, Sun-Earth connection.	11	HR diagram	HW 8 due/ HW 9 begins Thursday April 5
Apr 9-13	Measuring the properties of stars. Patterns among stars	12	Stars and nebulae	HW 9 due/ HW 10 begins Thursday April 12

Apr 16-20	Star clusters Evolution and death of low mass stars	12, 13	Stars video **In-class presentations**	HW 10 due/ HW 11 begins Thursday April 19
Apr 23-27	Evolution and death of high mass stars Stellar remnants **MIDTERM 3 (Thursday, Apr 26)**	13, 14	Morphology of galaxies	HW 11 due/ HW 12 begins Thursday April 26
Apr 30 - May 4	Milky Way Galaxy A universe of galaxies	15,16	Hubble's Law	HW 12 due/ HW 13 begins Thursday May 3
May 7-11	Measuring distances in the Universe Introduction to cosmology; the Big Bang Model Review Session **Observing Project due May 10** **Written Project due May 10**	16, 17	Planetarium	HW 13 due Thursday May 10
May 15	**FINAL EXAM – Sections 1** **Wednesday, May 15th** **8:00 – 10:00 a.m. A109 SCI**	**Comprehensive/ Cumulative**		

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 spring semester at the beginning of February. 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).