ASTRONOMY 306
Observational Astronomy
Fall 2023

Instructor: Dr. Sebastian Zamfir Office: B-205 SCI Bldg. Email: szamfir@uwsp.edu

Meeting Rooms/Times:

Lecture (A113 SCI) **–** Monday and Wednesday 12:00-12:50 PM

Lab (B204 SCI)**:** Thursday 8:00 – 10:30 PM

Catalog Description:

ASTR 306. Observational Astronomy. 3 cr. - Designed to provide direct experience in astronomical observations and their analysis. Involves nighttime observations with the 16-inch telescope in the campus observatory, the use of smaller portable telescopes, and computer-based exercises. Topics will range from CCD observations and processing, photometry, and astrophotography, to the interactive use of large online astronomical databases. 2 hrs lec, 2.5 hrs lab per wk.

Prerequisite(s): One of the following: ASTR 100, ASTR 205, or ASTR 206

Office Hours:

Monday: 1 – 2 PM Tuesday: 12 – 2 PM Wednesday: 1 – 2 PM Thursday: 1 – 2 PM

Textbook: *Observational Astronomy (2nd Ed.) by Birney, Gonzalez, Osper*

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

Course website: https://uwsa.instructure.com/courses/611589
Log in using your UWSP login and password. ***This website will be used for posting grades, lecture and lab notes, homework assignments, study-guides, and, very importantly, class announcements, etc.***

Learning Outcomes:

Upon successful completing this course, students will be able to:

-- Understand coordinate systems used in finding and recording celestial objects
-- Set up and use common types of telescopes
-- Locate celestial objects of interest using telescopes with and without automated pointing systems
-- Perform and interpret images/observations
-- Analyze datasets using simple mathematical models
-- Interact with large, online databases, extract and analyze relevant information from them
-- Carry out and report a complete research project, from concept and data collection to analysis and conclusions

Clear Sky Chart for UWSP Observatory:
http://www.cleardarksky.com/c/UWSPObWIkey.html?1 OR

https://astrospheric.com/?Latitude=44.55385971069336&Longitude=-89.56761169433594&Loc=Forecast

Grading Policies:
You will have the following contribution to your final grade:
Lab reports 35%
Final exam 15%
Homework 15%
In-class quizzes 5%
SLOOH Quests 15%
Final Project 15%

TOTAL: 100%

Your current grades are updated typically every week. If you have any questions on the grades listed, please contact me immediately so any errors can be corrected.

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%

Attendance:

Lecture attendance is **strongly recommended**. It is extremely important to an effective learning process. Although some lecture slides might be available on the course website, they are not necessarily complete. They are meant only as an outline of a subject. Not everything that we talk about in the classroom is on the slides and what is on the slides is not always self-explanatory. Frequently, I will give quizzes during the lecture time. They will have a 5% contribution toward the final grade.

The scheduled final exam will be "in-class" (no take-home exams).

Laboratory attendance is **mandatory**. The laboratory is an integral part of the course. A missed lab will automatically bring a zero contribution to the corresponding lab grade.

Laboratory work: The labs will account for 35% of the final grade. **The lowest lab grade will be dropped.**

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 period**. 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!**

Final exam: A **comprehensive/cumulative** final exam will be given during finals week, on Monday, December the 18th (10:15 AM – 12:15 PM). It is worth 15% 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 possible) so that we could make proper arrangements. It is your responsibility to provide me with a valid doctor's excuse for any illness that prevents you from fulfilling the requirements of this class.*

Homework: I will hand out a homework assignment almost every week. I will emphasize the due date. Homework assignments will typically be due a week later. **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 15% of your final grade.

Research final project: A research project will be assigned sometime in the second half of the semester; it is worth 15% of your final grade. You will be working as a group on putting together and presenting the project. We'll set aside the lecture and/or lab time during the last week of regular classes for group presentations.

SLOOH Quests: Each of you has a one-year license to utilize Slooh.com. Use this link **https://app.slooh.com/at/50240-D89D4** to create your account. Your name will be added to a workspace called **UWSP Astronomy Fall 2023.** Here you will be assigned **Quests**, which will be contributing to your final overall grade.

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/finaid/veteran-services/Pages/default.aspx

Equal Access for Students with Disabilities:
Students with special needs should contact the Disability Resource Center as soon as possible (http://www.uwsp.edu/disability/Pages/default.aspx) to request suitable accommodation. If special accommodation is needed, *please inform the instructor, and contact the Disability Resource Center, Phone: 346-3365, Room 108 in the Collins Classroom Center (CCC).*

Religious Beliefs Accommodations:
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.

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 https://www3.uwsp.edu/emergency/Pages/emergency-procedures.aspx for details on all emergency response at UW-Stevens Point.

Academic Honesty: Students are expected to maintain the highest standards of academic integrity. 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.

Lecture materials and recordings are protected intellectual property at UW-Stevens Point. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use. If a lecture is not already recorded, you are not authorized to record my lectures without my permission unless you are considered by the university to be a qualified student with a disability requiring accommodation. [Regent Policy Document 4-1] Students may not copy or share lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

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.

Other UWSP Student Resources:

Tutoring and Learning Center: https://www3.uwsp.edu/tlc/Pages/default.aspx

Dean of Students: https://www3.uwsp.edu/dos/Pages/default.aspx

Academic and Career Advising: https://www3.uwsp.edu/ACAC/Pages/default.aspx

Counseling Center: https://www3.uwsp.edu/counseling/Pages/default.aspx

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.

The following is a tentative list of potential topics and activities that will be covered in the lecture, labs, and homework. The selection is subject to change:

- Celestial sphere and systems of coordinates
- Patterns and motions in the sky; constellations
- Time, target names, charts, catalogs, databases
- Quantifying light; telescopes
- Optical telescopes and imaging cameras
- The Sun and solar observations
- Filters, image collection, image processing
- Stars – classification, luminosity classes, sizes, HR diagrams
- Magnitudes, image calibrations, effects of the atmosphere
- Star clusters, stellar photometry
- Kepler's laws
- Astrometry
- The Moon and lunar observations
- Extrasolar planets and methods of detecting extrasolar planets
- Galaxies, image processing and color imaging
- Radio Astronomy
- Astronomical Spectroscopy, spectra of stars, galaxies, and quasars