

Introductory Astronomy – Physics 150/155
Fall 2021
SUNY College at Cortland
Physics Department

Catalog Descriptions

Both Introductory Astronomy (PHY150, 3 cr. hr.) and Introductory Astronomy with Laboratory (PHY155, 4 cr. hr) are: A survey of modern astronomy. Topics include the planets and their moons, the sun and other stars, stellar structure and evolution, galaxies and cosmology. Some elementary algebra is used. Both fulfill LASR and if you have taken one, you cannot take the other.

Both have the following Student Learning Outcomes Upon successful completion of this course, students will be able to:

- Describe the scientific method and identify the interactions between scientists, theory, and observation.
- Differentiate the scientific endeavor from pseudoscience.
- Apply physical laws to a variety of astrophysical scenarios.
- Construct and defend an original logical argument in the context of astronomy or the history of astronomy.
- Solve scientific problems by expressing them in analytical terms and applying creative quantitative reasoning.

Additional description for Introductory Astronomy with Laboratory (PHY155): Laboratory consists of experiments pertinent to the field, planetarium observations, and outdoor (naked eye/telescope) observations when weather permits. Having a lab with means PHY155 fulfills GE 2

Additional Student Learning Outcome for PHY155:

- Record and analyze astronomical data.

Basic Information

Instructor: Doug Armstead
Office: 127 Bowers (607) 753-29179

Office Hours: MT 10-11am, W 12:30-1:30pm R 10am-noon. I am also available by appointment.

Email: douglas.armstead@cortland.edu

Course website: <https://facultyweb.cortland.edu/douglas.armstead/F21/Astronomy.html>.

Lecture meets: T R 1:15-2:30pm in Sperry 204.

Laboratory meets: W R. 7-8:50pm in Bowers 1112.

Text: *Astronomy* by Frankoi, Morrison and Wolff published by OpenStax.

Laboratory Manual: contact Beth Pennell, lab instructor.

Prerequisites: none.

Expectations

What you should expect from me:

- Explanations of physical concepts that include concrete examples and, where reasonable, demonstrations.
- In-class examples that help you to understand the kind of reasoning that is necessary to do the problems you will encounter in the homework and on exams.
- Careful and respectful consideration of your questions.
- An open door policy—if my office door is open you should feel free to come in and talk about physics. This is in addition to my regularly scheduled office hours listed above.

What I expect of you:

- Your presence in class, both physical and mental, for the entire class period.
- For you to be prepared when you arrive at class. This includes completing the assigned readings before you arrive. A careful reading means keeping track of questions the reading inspires and bringing them to class with you. It also includes working through the Examples and then comparing your result with the one provided in the text.
- When you have a question, ask it. I strongly encourage you to do this during class since one topic builds on the last. Your fellow classmates will thank you—if you are unclear on something, chances are the person next to you is, too.
- Be considerate of your fellow classmates by turning off your cell phones during class and not eating in class.
- Submit work for grading that is your own. If you copy from another student or source and submit it for a grade, then you risk receiving an F in the course.

Grades

You start this class out with an A. Over the course of this semester your grade will be adjusted based on the degree of mastery of the material you show through your homework, in your labs, on the midterm exams and on the final exam. The final score for the class has the following weighting:

Element	PHY150	PHY155
Problem sets	25%	20%
Labs	-	20%
Midterm Exams #1 & 2	50%	40%
Report	5%	5%
Final Exam	20%	15%
Total	100%	100%

Note: the lab is a required part of PHY155.

Graded Elements

Problem sets: Problem sets (typically 3-5 problems) will be assigned frequently and due most lecture days at 5pm. You are welcome to work in groups to understand the problem but you must independently write your solution.

Solution Format:

- All pages must be stapled together.
- Use a dark pencil or pen.
- The logic of your solution should begin with a clear statement of the basic principle(s) and flow from complete sentences and clear diagrams. Each step should follow clearly from the one before.

Seldom will your first attempt at a solution be of the quality you should hand in. I expect you to proofread, correct, edit, and generally clean up your solutions.

Labs: Your lab grade will be determined by your lab reports both formal and informal as well as your performance in the lab.

Exams: The exam format will include problems that probe both your conceptual and qualitative understanding of the material. Exams will be taken in class and you will be allowed one 3x5 index card with your own notes on it for each exam. The final exam will be cumulative. **If there is a conflict with a test because of a college-sponsored function, I must be notified in advance and arrangements made prior to the exam. Failure to do so will result in a zero for that exam. In case of emergency I must be notified immediately.** A make-up exam will only be administered for illness that requires confinement to bed on physician's orders, death/serious illness in the immediate family, or appearance in court. Supporting documentation will be required.

Report: There are so many interesting things to explore that it is impossible to include all of them in this course. To bridge this gap you will be expected to write a short paper about one of the things we don't make it to in the lecture for this course (e.g. a type of solar system debris) and how we know what we know about it.

The raw score above is turned into a grade as follows:

Final %	Grade
90-100	A- to A
80-89	B- to B+
70-79	C- to C+ etc.

Academic Integrity¹

Honesty is an essential part of academic integrity and at the heart of scientific research. Scientists and other scholars take pride in ownership of their own work. They do not take credit for the effort or ideas of others and do not tolerate those who do. This includes cheating, plagiarism and not contributing to group projects. This concept is based on mutual trust. If you cheat you are chipping away at your own moral character and undermining the overall integrity of our college society. Violations of this trust are acts of academic dishonesty; offenses will not be tolerated and may result in a zero on that assignment or in failure for the course.

Obviously, cheating on tests or quizzes involves using information to which you are not entitled such as copying or receiving information from a classmate or using notes other than those permitted by the instructor.

Plagiarism, according to *Webster's New Collegiate Dictionary* is to steal or pass off the ideas and words of another person as new and original an idea or product derived from an existing source. Obviously using work from another student who has previously taken this course is plagiarism.

Group work and group projects are valuable learning experiences, and will be the basis of most lab work. However, it is a form of dishonesty to claim credit for work to which you have not contributed.

I encourage students to work together in discussing methods of solutions to problems in homework assignments. Seek help from the instructor, but only after you have reached an impasse in your own concentrated effort. Much valuable learning can occur in the *active participation* in such discussions. However, because you are placing your name alone on an assignment, you should then write up your own original solutions. You are not being honest if you just copy another's solution without any thought of your own.

READ (and understand) the College's statements and procedures on Academic Integrity in the Undergraduate Catalog. Ask the instructor if you have any uncertainty about what is proper and what is not.

¹Adapted from Dr. William L. Johnson's statement of academic integrity.

Disability Statement

As part of SUNY Cortland's commitment to a diverse, equitable, and inclusive environment, we strive to provide students with equal access to all courses. If you believe you will require accommodations in this course, please place a request with the Disability Resources Office at disability.resources@cortland.edu or call 607-753-2967. Please note that accommodations are generally not provided retroactively so timely contact with the Disability Resources Office is important. All students should consider meeting with their course instructor who may be helpful in other ways.

Diversity Statement

SUNY Cortland is dedicated to the premise that every individual is important in a unique way and contributes to the overall quality of the institution. We de

ne diversity broadly to include all aspects of human difference. The College is committed to inclusion, equity, and access and thus committed to creating and sustaining a climate that is equitable, respectful and free from prejudice for students, faculty and staff. We value diversity in the learning environment and know that it enhances our ability to inspire students to learn, lead and serve in a changing world. We are committed to promoting a diverse and inclusive campus through the recruitment and retention of faculty, staff and students. As a community, we hold important the democracy of ideas, tempered by a commitment to free speech and the standards of inquiry and debate. To this end, we are dedicated to developing and sustaining a learning environment where it is safe to explore our differences and celebrate the richness inherent in our pluralistic society.

Inclusive Learning Environment Statement

SUNY Cortland is committed to a diverse, equitable and inclusive environment. The course instructor honors this commitment and respects and values differences. All students enrolled in this course are expected to be considerate of others, promote a collaborative and supportive educational environment, and demonstrate respect for individuals with regard to ability or disability, age, ethnicity, gender, gender identity/expression, race, religion, sex, sexual orientation, socio-economic status or other aspects of identity. In an environment that fosters inclusion, students have the opportunity to bring their various identities into conversation as they

nd helpful, but are not expected to represent or speak for an entire group of people who share aspects of an identity. If you have any questions or concerns about this statement, contact the Institutional Equity and Inclusion Office at 607-753-2263.

Title IX Statement

Title IX, when combined with New York Human Rights Law and the New York Education Law 129-B, prohibits discrimination, harassment and violence based on sex, gender, gender identity/expression, and/or sexual orientation in the education setting. The federal Clery Act and NY Education Law 129-B provide certain rights and responsibilities after an incident of sexual or interpersonal violence. When a violation occurs, victims and survivors are eligible

for campus and community resources. Where the College has jurisdiction, it may investigate and take action in accordance with College policy. If you or someone you know wishes to report discrimination based in sex, gender, gender identity/expression, and/or sexual orientation, or wishes to report sexual harassment, sexual violence, stalking or relationship violence, please contact the Title IX Coordinator at 607-753-4550, or visit cortland.edu/titleix to learn about all reporting options and resources. (Updated by SUNY Legal Feb. 1, 2018).

Class Schedule

All dates are tentative.

Week	week starting	Chapter(s)	Topics
1	Aug. 31	1 & 2	Tour, naked eye observation, and evolution of Astronomy as a Science
2	Sept. 7	3 & 4	Gravity, motion, and time
3	Sept. 14	5 & 6	Light, atoms, motion, and telescopes
4	Sept. 21	7 & 8	Intro to Solar System, Earth - a case study of a planet
5	Sept. 28	9	Moon and Mercury Test: Chapters 1-6 on Thur. Sept. 30.
6	Oct. 5	10 & 11	Venus, Mars and Gas Giants
7	Oct. 12	Misc & 15	Solar system debris and the Sun - a case study of a star
8	Oct. 19	16	Powering the Sun Fall Break on Tuesday
9	Oct. 26	17	Learning from starlight Test: Chapters 7-14 on Thursday. Oct. 28.
10	Nov. 2	18 & 19	Stellar properties from starlight
11	Nov. 9	21-23	lifecycle of a star
12	Nov. 16	20 & 24	Other distant objects Report Due Thursday Nov. 18.
13	Nov. 23	25	Milkyway galaxy-our galaxy (Thanksgiving Break R)
14	Nov. 30	26 & 27	Other galaxies
15	Dec. 7	28 & 29	Large scale structure in the universe and the Big Bang
Final Exam from 11am-1pm on Wednesday, December 15, 2021			