Astronomy
The Solar System

PHYS104 - Fall 2022

Overview and basic info

Course info

Classroom: Hugel 142
Time: 1:10-2:00pm MWF, 7:00-10:00pm Tuesday
Textbook: 21st Century Astronomy, 6th Edition (Kay, Palen, & Blumenthal) with online access

Office Hours (*TENTATIVE*):
MWF 11:00-11:30am (Hugel 022)
MWF 2:00-2:30pm (Hugel 142)
T 1:30-3:00pm (Hugel 142) - subject to change!

Homework due Wednesdays at 5:00pm
Short essays due every other Friday at 5:00pm
Midterm project due Monday, October 18, 2021 at 5:00pm
Final project due Friday, December 17, 2021 at 5:00pm

Instructor

Dr. Stephanie Douglas
Please call me “Professor Douglas” or “Doctor Douglas” or “Professor”
My pronouns are she/her/hers
Email: douglste@lafayette.edu
Office: Hugel 022 (but most office hours will be in Hugel 142)

Course Policies

Attendance required, let me know ASAP if you will be absent

This class will be taught in person. All class and lab sessions will proceed assuming everyone is participating synchronously, and you will be graded on your participation in class activities. If you must miss class or lab sessions, please let me know as soon as possible. You are responsible for completing the day’s work to receive participation credit for that day.

Your health is always paramount, but even more so this semester. For minor illnesses, just let me know and I will waive participation for that day. **Please do not attend class if you are experiencing COVID-19 symptoms.**

If you will miss multiple classes due to COVID-19 or another serious illness, let me know ASAP and work with your local health provider (if applicable) and Bailey Health Center to obtain a Dean’s Excuse. Dean’s Excuses are also available for other disruptive life events. If you have a Dean’s Excuse, you will not be required to use the time bank, and participation grades will be waived for the time you were out.

If you will miss class, lab, or an assignment deadline due to a religious holiday, please contact me by **the add-drop deadline** so that we can make plans for you to complete the relevant work.

Masks required

Wearing a mask is known to reduce the transmission of SARS-CoV-2, the virus responsible for COVID-19. Regardless of your vaccination status, to protect the health of our class, masks must be worn during classes and labs. Masks should be made of a tightly woven cloth or non-woven synthetic filtering material, and should be worn properly over the nose and mouth and secured on the chin. Food and drink must also be consumed outside of the classroom (*brief* mask removal to drink water will be permitted as long as nobody abuses this). Students who show up to class without a mask will be asked to return to class wearing one in order to protect the health of our classroom community. In the event that you do not have access to a mask to wear during the class session, please let me know and I will help you obtain one

Contact and office hours

Open drop-in “contact” or “office” hours are listed above. If you would prefer to meet virtually for office hours, I will also keep a Zoom link open - see Moodle for the link.

If the above times will never work for you, please let me know ASAP so I can adjust.

I will also set up blocks of available time each week for one-on-one meetings; if these blocks don’t work for you, please email me and we can schedule a meeting at another time. One-on-one meetings will be virtual unless we both agree otherwise.

I will generally check email between 10-6 on weekdays, and will reply by the end of the next weekday. I will sometimes check email at other times, but this is not guaranteed.

I expect you to check email (and read any announcements) at least once between each class.

Labs: bring warm clothes; bus for off-campus labs leaves at 7 sharp

We will go outside for at least part of the lab whenever possible. Bring more warm layers than you think you will need - you’ll feel colder standing outside to work than you will while walking across campus.

Labs will take place rain or shine. In bad weather, we will do indoor activities in Hugel 142. If the weather is good, we will take a bus to a dark sky site near Merrill Creek Reservoir in NJ, and use the telescopes there. The lab location will be announced by 3pm each Tuesday, via email.

For off-campus observing labs, we will take a chartered bus. **The bus will leave promptly at 7pm.** If you are late, you will miss the bus and receive a 0 for the lab.

Contingency plan for virtual meetings

Ideally we will be able to maintain in-person classes this semester. However, COVID-19 or weather may temporarily require us to switch to Zoom meetings. I will let you know as far in advance as possible if this is necessary. The Zoom link will be posted to Moodle.

Hopefully we're all familiar with virtual class etiquette by now. Mute your mic when you're not speaking, raise your hand physically or virtually to speak, be polite in the chat, etc. I would appreciate it if you keep your cameras on - if this isn't possible, please set up an appropriate profile picture so that I'm at least not talking to blank squares.

Accomodations: flexible, let me know as early as possible

My policy: Your success in this class is important to me. If you need accommodations for any reason, please speak with me privately ASAP to discuss reasonable accommodations. I am happy to consider creative solutions as long as they do not compromise the learning goals of the activity.

Mandatory statement for any Lafayette course with a disability policy: Lafayette College is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning in this course, you are welcome to discuss your concerns with me. If you have a disability, or think you may have a disability, please meet with the Office of Accessibility Services, to begin this conversation or request an official accommodation. If you have already been approved for accommodations through the Office of Accessibility Services, please meet with me so we can develop an implementation plan together.

Collaboration and Plagiarism

You are expected to abide by the principles of intellectual honesty outlined in the Lafayette College Student Handbook. All answers must be given in your own words, not copied from the textbook or any other resources. Copying solutions from another source is a violation of the Academic Integrity Policy. This includes Chegg, Bartleby, CourseHero, or similar websites; instructor/publisher solutions; the work of past students; or anything else you can find on Google.

Science is a social enterprise, and I encourage you to collaborate with your peers on homework, in-class activities, labs, studying, etc. "Collaboration" does not mean "copying." You must understand and individually write out your own answers, and you must turn in your own copy of each assignment.

You may not work collaboratively on projects, unless otherwise noted.

Evidence of plagiarism will yield a reduced or zero grade for the assignment at the discretion of the instructor, and may be reported to the College.

Commitment to Inclusion and Equity

Lafayette College is committed to creating a diverse community: one that is inclusive and responsive, and is supportive of each and all of its faculty, students, and staff. The College seeks to promote diversity in its many manifestations. These include but are not limited to race, ethnicity, socioeconomic status, gender, gender identity, sexual orientation, religion, disability, and place of origin. The College recognizes that we live in an increasingly interconnected, globalized world, and that students benefit from learning in educational and social contexts in which there are participants from all manner of backgrounds. The goal is to encourage students to consider diverse experiences and perspectives throughout their lives. All members of the College community share a responsibility for creating, maintaining, and developing a learning environment in which difference is valued, equity is sought, and inclusiveness is practiced.

If you are experiencing discrimination or harrassment in this class, please do not hesitate to reach out to me so that I can help resolve the issue.

Do not repost learning materials, do not create your own class recordings

All course materials are proprietary and for class purposes only. This includes posted recordings of lectures, worksheets, discussion prompts, and other course items. Such materials should not be reposted, and should be deleted at the end of the semester. Online discussions should also remain private and not be shared outside of the course. If you have any questions about proper usage of course materials feel free to ask me. You may not record classes yourself.

Moodle privacy statement

Moodle contains student information that is protected by the Family Educational Right to Privacy Act (FERPA). Disclosure to unauthorized parties violates federal privacy laws. Courses using Moodle will make student information visible to other students in this class. Please remember that this information is protected by these federal privacy laws and must not be shared with anyone outside the class. Questions can be referred to the Registrar's Office.

Assignments and grading

Unless otherwise noted, all assignments must either be completed entirely within Moodle or Norton Smartwork. Submissions to Moodle must be uploaded as PDF files or Kaltura video submissions. Work that is uploaded as an image straight from your camera will not be graded.

Course Grade Components

Attendance and class participation: 10%
Labs: 20%
Homework: 20%

Short essays: 15%
Midterm project: 15%
Final project: 20%

Three 48-hour free passes to extend deadlines

Over the course of the semester, you will have three 48-hour passes that you can use to extend deadlines for homework, labs, or essays, no questions asked. You may combine 2 or 3 of these passes on a single assignment, but you may not subdivide the 48-hour increments. The only exception is the final project - you may only use 1 pass on the final. When you turn the assignment in, email me or write a note across the top of your assignment submission, indicating the number of passes you would like to use.

Late work policy: 3.33% off per 24 hours late

I will accept late homeworks until the solutions and grades for that assignment are posted (typically one week after they're turned in). Once solutions and grades are posted, no late assignments will be accepted without prior approval. If you do not use the time bank, late assignments will be penalized by 3.33 percentage points per 24 hours after the assigned deadline (10% per 3 days late), up to 25% of the total points for that assignment.

Attendance and class participation (10%)

Showing up to class is your primary source of participation points, and will be calculated as the fraction of classes you attend. If you have unexcused absences, you can also increase your participation score by participating in discussions, group work, and other in-class activities, and by attending office hours.

Labs (20%)

Lab periods will generally involve extended activities intended to help you uncover challenging concepts and to meet the Natural Science requirements of the Common Course of Study.

Lab grades will be based on the following

- A completed worksheet or brief report turned in at the end of the lab period (one per group)
- Accuracy of responses on the group worksheet
- Accuracy of responses to individual check-out questions before leaving lab

Homework (20%)

Each week you will be assigned 1.5-2 hours of homework consisting of conceptual questions, sketches, diagrams, math problems, and other tasks that suit the content from the previous week. I encourage you to work together on homework, though you must turn in your own copies of each assignment. It must be clear that short answer/essay questions were written in your own words.

You will generally submit homeworks via Norton Smartwork. Some questions won't be automatically graded - for those questions, I will generally grade them and post solutions within one week. I will drop your lowest homework grade.

Short essays (15%)

Every other week, you will also receive a more challenging assignment requiring you to apply concepts again. These will serve as drafts for various sections of the midterm and final projects. You will be able to present your results as either a written essay/solution, or as a video. You must work independently on these assignments.

70% of your Short essay grades will be based on completion according to a basic set of standards.

You will combine these assignments into larger essays or video presentations for the midterm and final projects. I strongly suggest that you choose a single planet or moon to focus on throughout the semester. You can change your mind about your topic at any time, you'll just have to re-do some work when you get to the midterm or final projects.

Midterm Project (15%) and Final Project (20%)

In lieu of exams, you will produce two projects that build on your Short essays and labs. These projects WILL be graded based on content and accuracy. You must work independently on these projects.

You may consult your book, other class material, and me for your projects. You may consult some outside sources as long as you cite them and paraphrase all material in your own words - as a reminder, using solutions from Chegg, CourseHero, Bartleby, etc, is a violation of the Academic Integrity Policy.

Course Outcomes

After completing this course, you will be able to…

- Use simple optical telescopes
- Explain what causes the phases of the Moon and Seasons on Earth, and apply this knowledge to other planets
- Explain how the Solar System is studied using telescopes and space probes
- Describe the basic characteristics of the bodies in the Solar System, and how they are classified
- Explain how the bodies in the Solar System formed and obtained their present-day characteristics
- Make simple geometric calculations for purposes such as measuring distances and angular sizes
- Carry out algebraic problem-solving using Kepler's Laws and other physical laws
- Calculate planet surface temperatures, and explain the greenhouse effect

- Explain how planets are discovered around other stars, and compare exoplanetary systems with our Solar System

In addition to the outcomes listed above, this course will promote the outcomes from the Natural Sciences section of the Common Course of Study. You will be able to…

- NS 1: Employ the fundamental elements of the scientific method in the physical and natural world by identifying and evaluating a testable scientific hypothesis.
- NS 2: Create and evaluate descriptions and representations of scientific data via equations, graphs, tables, and/or models.

Specific learning goals for each unit will be distributed weekly.

Mandatory credit hour statement

The student work in this course is in full compliance with the federal definition of a four credit hour course.

Planned course schedule (subject to change)

Specific learning goals for each unit will be distributed weekly. All assignments due 5pm.

Textbook: 21st Century Astronomy, 6th Edition (Kay, Palen, & Blumenthal) with online access

Week	Monday	Ch.	Topic	Other notes
1	Aug 29	1	Our place in space, scientific method	
2	Sep 5	2	The sky, moon phases, seasons	1st Short essay due Friday Add/drop deadline Friday
3	Sep 12	3	Planetary motion, Kepler's laws, Newton's laws	
4	Sep 19	4	Gravity, orbits, tides	2nd Short essay due Friday
5	Sep 26	5	Light, doppler shift, temperature	
6	Oct 3	6	Telescopes and spacecraft	Earliest possible date for off-campus (Merrill Creek) labs 3rd Short essay due Friday
7	Oct 10	7	Star and planet formation	Fall break: no class Monday, no lab
8	Oct 17	7-8	Searching for exoplanets, planetary geology	Midterm project due Monday
9	Oct 24	8-9	Planetary geology, planetary atmospheres	
10	Oct 31	9	Planetary atmospheres, climate change	4th Short essay due Friday
11	Nov 7	10	Jovian planets	Daylight Saving Time starts
12	Nov 14	11-12	Moons, rings, and dwarf planets	5th Short essay due Friday
13	Nov 21	12	Meteorites and collisions	Thanksgiving break, no class Wednesday or Friday. No lab.
14	Nov 28	14, 24	The Sun, life on Earth	6th Short essay due Friday
15	Dec 5	24	Exoplanets, life in the universe	
	Finals week			Last homework assignment due Final project due Saturday, December 17