Evaluation of the California Institute of Technology (Caltech) Global Relay of Observatories Watching Transients Happen (GROWTH) Partnership for International Research and Education (PIRE) Fall 2019 Courses

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THE MARK

Fall 2019 ASTR 310 Observational Astronomy Course

Response Statistics

25 out of 27 participants responded to the survey for a 93% response rate.

Please rate your level of agreement with the following aspects of the course.

	Strongly disagree		Disagree		Neither disagree nor agree		Agree		Strongly agree		Responses
	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count
Lecture information was presented in a logical, step-by-step order.	0	%	3	12%	2	8%	8	32%	12	48%	25
The use of telescopes and CCDs first-hand during observing enhanced my learning experience.	3	12%	1	4%	6	24%	4	16%	11	44%	25
The use of real world data was valuable to my learning.	0	%	0	%	0	%	6	24%	19	76%	25
The opportunity to collect my own data was useful to my learning.	0	%	0	%	2	8%	10	40%	13	52%	25
Instructor handled student questions well.	0	%	0	%	0	%	4	16%	21	84%	25
Instructor could identify and address student concerns about the material.	0	%	1	4%	0	%	8	32%	16	64%	25
Instructor was available to provide assistance during office hours.	0	%	0	%	2	8%	4	16%	19	76%	25
Instructor demonstrated enthusiasm for the subject matter.	0	%	0	%	0	%	4	16%	21	84%	25
Instructor had a strong command of the subject matter.	0	%	0	%	0	%	1	4%	24	96%	25

*Darker shades of teal indicate higher counts of that option being selected.

Please rate your level of agreement with the following statements: This course…

	Strongly disagree		Disagree		Neither disagree nor agree		Agree		Strongly agree		Responses
	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count
Increased my understanding of the research process in astronomy/astrophysics.	0	%	0	%	1	4%	8	32%	16	64%	25
Increased my interest in becoming an astronomer.	1	4%	4	16%	2	8%	7	28%	11	44%	25
Increased my overall knowledge of astronomy/astrophysics.	0	%	0	%	2	8%	11	44%	12	48%	25
Increased my knowledge of the fundamentals of modern observational photometry, astronomy, and spectroscopy.	0	%	0	%	0	%	8	32%	17	68%	25
Increased my knowledge of limitations of observational data and the data reduction process.	0	%	0	%	1	4%	8	32%	16	64%	25
Increased my ability to explain how typical optical telescopes and CCDs work.	0	%	1	4%	1	4%	7	28%	16	64%	25
Increased my ability to compare capabilities of different optical systems of telescopes and CCDs.	0	%	1	4%	0	%	13	52%	11	44%	25
Increased my ability to keep a detailed log of data gathering and data analysis.	1	4%	1	4%	3	12%	10	40%	10	40%	25
Increased my ability to utilize large data sets to formulate a question that can be answered using the data set.	1	4%	0	%	2	8%	8	32%	14	56%	25
Increased my ability to manipulate and search large data sets to answer the generated question.	1	4%	0	%	1	4%	7	28%	16	64%	25
Increased my ability to create and adapt MATLAB code.	0	%	1	4%	4	16%	9	36%	11	44%	25
Increased my ability to communicate research results effectively, in scientific papers and talks.	0	%	1	4%	0	%	10	40%	14	56%	25
Increased my ability to collaborate with other researchers productively.	0	%	0	%	2	8.0%	9	36%	14	56%	25
Increased my ability to contribute to different parts of the research project process.	0	%	1	4%	0	%	10	40%	14	56%	25
Increased my interest in astronomy/astrophysics research.	1	4%	2	8%	4	16%	4	16%	14	56%	25

*Darker shades of teal indicate higher counts of that option being selected.

Has your participation in this course impacted your decision to remain in your major or change your major?

Value	Percent	Count
Yes	52%	13
No	48%	12
Totals		25

In what ways?

Response
Being able to pick and work with a topic of my choice for so long really boosted my appreciation of the topics covered
It showed me what research is like and made me feel like that might be something I would want to do for my career.
I found myself more interested in creating MATLAB code to do research on images.
It was really fun to observe and get a final result from my data.
Having had the opportunity to do what is closest to real astronomical research, I want to stay in the major
I am now more certain that I want to become an astrophysics researcher.
It cemented my interest in astronomy.
I will definitely remain an astronomy major
One of my concerns with being an astronomer was having to observe at remote locations all night. I really appreciated not having to observe at night for this course - writing proposals for Lowell Observatory was much better and more in line with what I want to do.
Well, I won't know, for sure, if this path is the one I want to follow until I actually do research projects, and this class gave me a little taste of research experience. I enjoyed doing the research, and I want to stay in this major :)
Being in this course has greatly increased my passion for this major :)
I liked making the observations at the observatory it was really interesting
I learned a lot about what type of science astronomers actually do and the type of work that goes into it. It cleared up any miss conceptions that go into it.

*Those who answered Yes to “Has your participation in this course impacted your decision to remain in your major or change your major?” were shown this question.

Please explain.

Response
Although this class dissuaded me to going into astronomy research, I still wish to complete the major as I am still interested in the challenges
I was gonna continue in the major anyway
I wanted to remain in Astronomy, and this course has not changed my mind.
I'm still interested in Astronomy and Physics
I enjoyed this course but I was committed to my major and it has simply confirmed my already held beliefs.
I would continue in this major with or without the course.
I did change my major this semester, but this course did not play a role in that decision
I still want to do astronomy.
This course hasn't affected my decision to stay in my major, although it made me realize that I don't particularly enjoy this kind of research.
I am a physics/astro major near graduation, and this course has done nothing to change that.
I came in to school wanting to be an astronomy major, and still do. kind of more interested in the story of how we know what we know instead of finding new stuff
This class had no effect on me considering to change my major. I have always intended to keep my major.

*Those who answered No to “Has your participation in this course impacted your decision to remain in your major or change your major?” were shown this question.

Are you interested in pursuing graduate school?

Value	Percent	Count
Yes	88%	22
No	12%	3
Totals		25

What degree and field?

Response
Astronomy or Physics
well, initially astronomy/physics/geology, but now I am thinking science and technology studies with a focus on space history
Physics/Astrophysics, hopefully PhD
Physics or solar physics.
Doctorate in Astrophysics
Astrophysics
PhD in astrophysics and possibly JD in some form of law school.
I would eventually like to go to grad school for astrophysics
Astronomy, but I'm not sure if I want to go directly after getting my undergrad degree
Astronomy, PhD (unsure for now).
I don't know yet, but I am interested in physics, astronomy, and engineering.
PhD in Planetary Science, Atmospheric Science, or Geological Science (focused on surfaces)
Astronomy and physics
astrophysics, possibly relating to exoplanet detection
Astrophysics, possibly exoplanets
Atmospheric Sciences specifically Lightning Physics
Astronomy degree, sometime in the future. Not quite right away.
The most specificity I can give is Astronomy
Astronomy, astrobiology/exoplanetary subjects (most likely)
Astronomy, but not sure about grad school
Astronomy PhD (maybe)
Potentially public policy, engineering, law, or receiving a PhD In astrophysics

*Those who answered Yes to “Are you interested in pursuing graduate school?” were shown this question.

Has participating in this course affected your interest in pursuing graduate school?

Value	Percent	Count
Yes	52%	13
No	48%	12
Totals		25

In what ways?

Response
Possible research areas and methods to look into as a graduate.
My interest has increased. However, It also made me understand how hard it will be.
It made me more likely to pursue graduate school by making me feel like I can do research.
I have a better understanding of what research entails, and I am more interested in pursuing grad school
Motivated me in pursuing research
The prospect of doing research in graduate school was made a lot less daunting because of the experience I gained during this class
It made me want to go to grad school even more.
I am now more certain that I want to become an astrophysics researcher, a career that I could pursue only after going to graduate school.
I do NOT want to be a research scientist.
It has helped me see what grad school and research looks like.
This course introduced me to observational research, which is something I could possibly be involved in during graduate school. I would be more open to that now that I know I may not have to actually have to participate in remote night observations.
I do not know if I want to be an observational astronomer after this.
It's made me less likely to pursue a PhD that involves years of research

*Those who answered Yes to “Has participating in this course affected your interest in pursuing graduate school?” were shown this question.

Please explain.

Response
I've planned on going to graduate school, this didn't change that
I would still consider graduate school with or without this course.
The idea of grad school is something I am still mulling over. There are a few careers I might want to pursue and research in astronomy is one of them, but I don't think I will make a decision until later in my college career when I will have had more internship experience.
My want to go to graduate school existed before this course and has not changed
I felt certain I wanted to go to grad school before this class, and it has not changed that.
I wanted to go regardless
I am still unsure.
I still want to go to graduate school.
I wanted to go to grad school and this course has not changed my mind
I already wanted to attend graduate school.
I don't really associate this course with grad school
I am still not interested in going to grad school.

*Those who answered No to “Has participating in this course affected your interest in pursuing graduate school?” were shown this question.

How has this course impacted your interest in becoming an astronomer?

Response
Yes, it made me want to become an astronomer even more.
I know I still want to do astronomy as a career.
Overall, my interest has remained the same. I'm still interested in becoming an astronomer.
It made me want to be an observational astronomer.
Showed me how real observational astronomers work
i really, really did not like writing research papers...and if that's all a phd is, then nope.
Increased interest
I don't know how close the class work and challenges were to work in the astronomy field, but I did enjoy the projects. This was one of the harder classes I've taken and that might have dissuaded me
It's about the same
It confirmed my interest in doing research.
It has increased my desire to become an astronomer
I do not want to become an astronomer, and this class did not change that. I do have more interest in doing amateur astronomy, and I feel more confident that I could take my own images and process them now.
I find observing interesting but I don't believe that I will decide to be an astronomer
Having had the opportunity to do what is closest to real astronomical research, I found that this is fun
No, I do not want to do stellar astronomy but am really interested in solar and plasma physics. I want to be an astronomer but not in this field.
This course made observations more interesting.
Positively, want to continue the major
I think doing your own observing is something that is really interesting, and learning a lot about some techniques for it has made me even more interested. However, I did not actually get to do my observing in this course, unfortunately.
I realized I don't care too much for observational processes
I've been interested in becoming an astronomer, and this course has reinforced my interests.

How has this course impacted your interest in becoming an astronomer? Cont.

Response
It has given me hands on research and important knowledge of how data is collected and the process of observations.
It's made me realIze that I may be better suited to other careers
I still want to be an astronomer, especially since there's less of a chance that I'll have to physically partake in remote night observations.
I haven't decided if I do or don't want to do research or academia. This gave me more insight into research fields.
It gave me a positive experience with research which makes me more confident in my own ability to become an astronomer.

How has this course impacted your understanding of the research process?

Response
Yes, this course has impacted my understanding of the research process. I enjoyed how my professor layed out the project for me in a straightforward way and I had many deadlines to insure I made the paper in time.
The constant editing and revising of papers
Greatly. I used to say I wanted to do research and not really know what that meant, but now I have a much better understanding of the process.
improved greatly
I already had an understanding of research.
I had a solid understanding in the research process before this class, I might have learned more.
It made my understanding much better
It has furthered my understanding of what is required in a research project.
Yes, I understand more how observations and raw data are collected
Gathering lots of data and doing statistical analysis
It made the specifics of working on an astronomy group research project more clear.
it's just as boring as biomedical research...
Yes, I learned how to use and collect data from a telescope for the first time.
I have a better understanding of the process and the amount of editing.
It has not really impacted my understanding. I have been working on research for a couple years now on actual projects that have done so instead.
I know better how much goes into a research paper, including how many revisions it takes to make something readable
It has deepened my understanding of the research process.
I'm learning that it's sloppier than one might think about, as are most things, and I'm learning that for a lot of research there is already data out there. Knowing a lot of current research is very helpful, as well, to begin to form your scientific question.
I better understand how to work with other and the importance of setting deadlines.
This course gave me an in depth understanding of what goes into the research process.

How has this course impacted your understanding of the research process? Cont.

Response
I better understand the process of group research now and have strategies for effectively working in research groups for the future. I also understand what observational research entails, such as the most important aspects of observing proposals.
It's helped me understand the research process and get first hand experience with it
I learned a lot more about how research is done in astronomy.
I feel like I have a good understanding if the research process and feel more comfortable about it going forward.
I now have more experience writing papers and proposals.

Are you interested in participating in astronomy/astrophysics research projects? Please explain how this course impacted your interest.

Response
Yes I am. I would like to keep doing projects similar to what we did in this course
yes, but this class didn't really effect this?
I would be interested in doing this type of thing for a living.
I am already part of a research group and It is great
Yes, I would like to do research. I enjoyed the process and exploring the hypothesis.
yes, i am. the self-guided research inspired me
yes, I enjoyed the real-world work and working at the observatory
Yes, and I specifically want to do some projects where I need to do observing myself. I am excited to find knowledge about the Universe by doing various projects.
Yes! Learning about the process and then actually completing a project has been a very rewarding process, especially because we took own images at the UMD Observatory. Very valuable experience.
not really. i also didn't find the topics we had to research very interesting, which might have impacted how much i enjoyed working on the semester long projects
Yes I am, but I am not interested in observational projects. This course did not change that
I would be willing to give observational astronomy a chance. I think the main reason I disliked this course was the manner information was presented to us and not the research itself.
Yes
I am not interested in research projects in this field, but doing projects in my major seems more interesting because of this course.
Yes, I am interested in participating in astronomy/astrophysics research projects. I am specifically interested in looking at exoplanets. This class showed that even though the research project is challenging it is doable.
Yes, I am currently involved in research with [redacted research program].
I am really interested in pursuing astronomy research projects. This course just confirmed that more.
yes, I now have a better idea of how research is conducted
Yes. Getting a taste for research projects confirmed this.
Yes, but I am more interested in computation and theory instead of observational astronomy, so this course just confirmed that.

Are you interested in participating in astronomy/astrophysics research projects? Please explain how this course impacted your interest. Cont.

Response
This course made me seriously consider looking into these opportunities in the near future.
Maybe, to see if it's something I enjoy, but I didn't really enjoy the experience that I had with it in this class
I am currently researching interacting galaxies at [redacted research lab]. I would be interested in doing research within University of Maryland's astronomy department.
Yes, but I'm not sure which kind (theoretical, experimental, etc.)
Yes! I'm interested in continuing with the astronomy research I began over the summer. This course did not impact my interest much, although I am happy that I can contribute to observational projects via coding.

Please provide any suggestions you have to improve the course.

Response
More information on lecture slides, I like to take notes and be able to look back on them.
No suggestions. It was great
If it is possible to get more students to observe themselves, I think that would be good for more hands-on learning. While there were benefits to submitting a Proposal to Lowell Observatory to get images, I think the best way to learn for many is through using taught skills in a practical context. Otherwise, I think this course was done very well!
The lectures can be redundant at times.
please have fewer writing samples, or at least make them digital. writing physically hurts for me, so typing is so much better....
Make the challenges homework, give more traditional lectures, include homework to supplement learning. Rely less on complicated readings
the pre-lecture quizzes only confused me. It was only until after the lectures i understood. Maybe if the quizzes were post lecture to solidify that students understood things
I know it's hard to get everyone telescope time, but I feel like just a field trip to the observatory to get used to the equipment would be useful to those of us who didn't get to use the telescopes.
Sometimes the lectures were very slow and a waste of time. We talked to our groups too much and I feel the content could have been taught more directly and efficiently.
Only thing I can think of is having students find scholarly papers that they can use in their final papers earlier in the course, rather than later.
None
N/A
great as is!
na
None.
none
Maybe have more choices of data within the iPTF database?
N/A
I enjoyed the course and think that it was effective the way it was.
Not much. The split focus on our projects for the entire semester was fantastic. This is by far the best structured group project class I have taken, good stuff

Please provide any suggestions you have to improve the course. Cont.

Response
Well some of the projects seemed too similar so maybe a wider range of options?
More conversation about the details of the information. Maybe include discussion answers on slides.
I really like that we didn't have to go to the UMD Observatory! I definitely suggest continuing to work with Lowell for practice on writing observational proposals. Changing to a more updated version of the iPTF database might be helpful for more accurate stellar classifications.
Make everything more structured and Actually have instructional lectures and labs rather than only truly discussion based ones. I felt that I had to learn all of the course content and skills on my own.
Connecting the class lectures a bit more to the work (projects and such). It felt a bit disconnected at times.

With which gender do you most closely identify?

Value	Percent	Count
Male	32%	8
Female	64%	16
Prefer not to answer	4%	1
Totals		25

Other, please specify:	Count
Totals	0

*Options included Male, Female, Other: please specify, and Prefer not to answer.

With which ethnic and racial background(s) do you most identify? (Select all that apply)

Value	Percent	Count
Asian	4%	1
Black or African American	4%	1
Native Hawaiian or Pacific Islander	4%	1
Hispanic or Latino	4%	1
White or Caucasian	96%	24

Other, please specify:	Count
Totals	0

*Options included Asian, American Indian or Alaskan Native, Black or African American, Native Hawaiian or Pacific Islander, Hispanic or Latino, White or Caucasian, Other: please specify, and Prefer not to answer.

Are you a first-generation college student (a first-generation college student is an individual whose parents never enrolled in post secondary education)?

Value	Percent	Count
Yes	8%	2
No	92%	23
Totals		25

*Options included Yes, No, I don't know, and Prefer not to answer.

Fall 2019 ASTRO 680 Astronomical Techniques Course

Response Statistics

Nine out of nine participants completed the survey for a 100% response rate.

Please rate your level of agreement with the following aspects of the course.

	Strongly disagree		Disagree		Neither disagree/ agree		Agree		Strongly agree		Responses
	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count
Lecture information was presented in a logical, step-by-step order	0	%	0	%	0	%	0	%	9	100%	9
Having special events, such as field trips, enhanced my learning experience	0	%	0	%	0	%	1	11%	8	89%	9
The use of real world data was valuable to my learning	0	%	0	%	0	%	0	%	9	100%	9
The opportunity to collect my own data was useful to my learning	0	%	0	%	0	%	0	%	9	100%	9
The tutorial videos and notebooks helped me learn new concepts	0	%	0	%	0	%	1	11%	8	89%	9
The instructor handled student questions well	0	%	1	11%	0	%	4	44%	4	44%	9
Instructor could identify and address student concerns about the material	0	%	0	%	1	11%	2	22%	6	67%	9
Instructor was available to provide assistance during office hours	0	%	0	%	1	11%	1	11%	7	78%	9
Instructor demonstrated enthusiasm for the subject matter	0	%	0	%	0	%	1	11%	8	89%	9
Instructor had a strong command of the subject matter	0	%	0	%	0	%	0	%	9	100%	9

*Darker shades of teal indicate higher counts of that option being selected.

Please rate your agreement with the following statements: This course…

	Strongly disagree		Disagree		Nether disagree/ agree		Agree		Strongly agree		Responses
	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count
Increased my understanding of the research process in astronomy/astrophysics	0	%	0	%	0	%	0	%	9	100%	9
Increased my knowledge of UNIX	0	%	0	%	2	22%	3	33%	4	44%	9
Increased my knowledge of programming with Python	0	%	0	%	0	%	3	33%	6	67%	9
Increased my knowledge of basic statistics, including probability distributions and error analysis	0	%	0	%	1	11%	2	22%	6	67%	9
Increased my knowledge of astronomical software	0	%	0	%	0	%	3	33%	6	67%	9
Increased my knowledge of image processing and photometry	0	%	0	%	0	%	0	%	9	100%	9
Increased my knowledge of spectroscopy and extracting spectra	0	%	1	11%	0	%	0	%	8	89%	9
Increased my ability to reduce and analyze data to produce new astrophysical measurements	0	%	0	%	0	%	2	22%	7	78%	9
Increased my ability to process data with my own code	0	%	0	%	0	%	2	22%	7	78%	9
Increased my ability to produce written and oral reports on my work	0	%	0	%	0	%	3	33%	6	67%	9
Increased my ability to operate the research telescopes as the Mount Laguna Observatory	0	%	0	%	0	%	1	11%	8	89%	9
Increased my interest in becoming an astronomer	0	%	0	%	0	%	3	33%	6	67%	9
Increased my excitement and passion for astronomy/astrophysics	0	%	0	%	0	%	1	11%	8	89%	9

*Darker shades of teal indicate higher counts of that option being selected.

Do you believe that participating in this course has affected your interest in pursuing further studies, and/or a career in a STEM-related field?

Value	Percent	Count
Yes	100%	9
Totals		9

*Options included Yes and No.

In what ways?

Response
It has encouraged me to pursue a degree further than a master's.
It has shown me the ways in which actual research can be performed and what opportunities are available.
I plan to continue a career STEM after finishing my masters. The statistics and coding combination helped me find my new passion and I plan to pursue this type of career in the near future. Thank you.
It provided a practical look at how the the field works.
When discussing and thinking about what fields of research I want to pursue, I can now make educated statements about how much I enjoy certain techniques in astronomy, (photometry, spectroscopy, etc.)
Before I knew that I wanted to pursue a PhD and get into observation instead of theory. This class sort of proved my point, this material is amazing and now I can use these skills toward observing in the future.
After this course, I find it difficult to see myself doing something outside of the field of astronomy. The material covered in this course was very comprehensive, and while challenging, it was fun and gratifying.
I learn lots of knowledge, it is interesting.
I was already very interested but this course did help inspire me

*Those who answered Yes to “Do you believe that participating in this course has affected your interest in pursuing further studies, and/or a career in a STEM-related field?” were shown this question.

Please explain.

*Those who answered No to “Do you believe that participating in this course has affected your interest in pursuing further studies, and/or a career in a STEM-related field?” were shown this question. No respondents chose this response.

Do you plan to enroll in a PhD program in astronomy/astrophysics?

Value	Percent	Count
Yes	89%	8
No	11%	1
Totals		9

How has this course has impacted your interest in becoming an astronomer?

Response
No
I like coding
I can utilize a lot of the information I used in the course in a career in the field.
This course taught me everything I feel I couldn't learn at a research university without its own telescope. I feel like I've learned more from this class than any other in a long time
I enjoy astronomy very much but I don't see myself pursuing a PhD immediately after my masters.
Yes - I knew I wanted to be an astronomer for a long time, but now after this course I am certain the field of astronomy is for me.
I feel that I'm performing actual astronomy which makes that work more meaningful and encouraging.
I already wanted to become an astronomer but this course helped reinforce that
It has, it has definitely made me more certain that I want to be one. I feel more confidently that I know the actual processes involved in research.

How has this course impacted your understanding of the research process?

Response
Se the above statements. My better understanding of the research process is one of my favorite things I have gathered from this course.
Yes, it made me realize that it is more difficult than I previously thought.
This was the biggest part of the class. Definitely provided an in-depth view of how research is performed.
The course has provided me a better understanding of the astronomical research process than other courses I have taken because we collected our own data, where in other courses students are typically provided data to work with.
Uncertainty in particular is a lot more important than I initially thought. Also, through bootstrapping, it's also much easier than I expected to calculate uncertainties
The projects (especially the final one). And writing up the project in an APJ style certainly was good practice
I learn a lot about writing an article, that is really helpful.
It showed me that coding takes so much more time than I thought, but writing reports take less time than I thought
The course helped me realize how important writing is to communicate my finding as a researcher. After taking this class I want to improve my writing.

Please provide any suggestions you may have to improve the course.

Response
The spectra project was fun but it got complicated when finding a wavelength solution, more help here would have been useful.
Perhaps have mini-deadlines for Projects in order to space out the workload. Pass out stress-relieving gadgets (i.e. fidget spinners or rubber ducks).
I would love a project where we need to come up with an observing project, and apply for time at MLO, take our data, and come up with a result. I feel like I know how to do certain tasks, but I would really like to know the process of how research studies are begun.
N/A
The fourth lab was a little frustrating but we discussed this in class. The quizzes could also be very stressful when there was a strict time limit
In my opinion this class was well put together. There were some hiccups in the timing of assignments which can be traced back to the students misunderstanding of some directions, so my only comment is to be sure the instructions are well understood by the class.
There may be a little too much template code to play around with. This causes us as students to follow what the professor wants us to do as opposed to find different creative approaches to the same problem.
It would be helpful if I could learn how to make a 3-D plot and animate plot. I want to learn more about MCMC.
Free MLO t-shirts, for one. I understand leaving the students on their own during finals week, but some students are closer knit than others and I feel like not everyone can answer questions on their own. This was only during finals week, the instructor was available frequently for questions throughout the rest of the course. I do feel like every lecture was rushed because of the abundance of material. If at all possible, I loosely propose splitting the class into two semesters, with the 680 course still being required and all about photometry and learning the tools necessary to begin observing anytime. The second course could be specifically about advanced topics like spectroscopy and have this class be an elective. I feel like more astronomers use photometry more frequently than spectroscopy, but I could be wrong.

With which gender do you most closely identify?

Value	Percent	Count
Male	89%	8
Female	11%	1
Totals		9

Other, please specify:	Count
Totals	0

*Options included Male, Female, Other: please specify, and Prefer not to answer.

With which ethnic and racial background(s) do you most identify? (Select all that apply)

Value	Percent	Count
Asian	44%	4
Black or African American	11%	1
Hispanic or Latino	11%	1
White or Caucasian	44%	4

Other, please specify:	Count
Totals	0

*Options included Asian, American Indian or Alaskan Native, Black or African American, Native Hawaiian or Pacific Islander, Hispanic or Latino, White or Caucasian, Other: please specify, and Prefer not to answer.

What is your current area of study (degree and field)?

Response
Astronomy M.S.
Astronomy Masters
Astronomy
Master
Master, Astronomy
Astronomy
Master's in Astronomy
Astronomy
1st year Astrophysics Masters

Are you a first-generation college student (a first-generation college student is an individual whose parents never enrolled in post secondary education)?

Value	Percent	Count
Yes	22%	2
No	78%	7
Totals		9

*Options included Yes, No, and Prefer not to answer.