



Syllabus

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Introduction to PHSCS 127

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Welcome to BYU Online!

This course is part of a small pilot program of online courses at BYU. This course is a highly structured learning experience that meets the university's general education requirements and will mirror the intensity of the on-campus course.

This course differs from regular on-campus courses in the following ways:

- **Course Content** – Aside from your textbook, all of the course content is contained online.
- **Course Completion** – You are allowed to complete this course at your own pace. There are only two restrictions: you cannot complete the course before October 15 and you must complete the course by the end of the Fall 2015 semester.
- **Orientation Meeting** – You are expected to attend an initial class orientation meeting. At this meeting, you will meet your instructor, course

TA and other members of the class. You will also have the opportunity to ask any questions you have about the class and how it operates.

- Course TA – This course has a specific TA that you can contact with questions about the course or course content. The TA will also assist you in creating a course completion schedule and meet with you for the course checkpoints.
- Checkpoints – Throughout the course you will be required to meet with the course TA at least five times for Checkpoint conferences. These meetings will take place in Adobe Connect. These checkpoints will allow you to discuss your progress in the course and help you follow your course completion plan.
- Discussion Board – This course contains a monitored course discussion board. This discussion board will allow you to post, respond to and evaluate various topics related to the course material.

As part of the pilot program, we will be asking you to help assess the success and effectiveness of this course, the faculty member, the course delivery and the course support. Your participation in this assessment effort will be critical to future opportunities for online learning at BYU. Please be prepared to provide meaningful feedback about your experience.

Course Schedule

These deadlines ensure that you continue to make adequate progress in the class and finish on schedule by the end of the regular semester:

- 1st Checkpoint: **10 September, 2015.**
 - Schedule all of your checkpoint appointments at least 48 hours (two days) beforehand. For example, if you want to do the checkpoint on Wednesday at 4:00 pm, be sure you schedule it by Monday at 3:00.
 - Be prepared to discuss the syllabus, and establish contact with your TA, Pam.
- Constellation Quiz: **September 8 - December 3, 2015**
 - Due to schedule constraints at the end of the regular semester, the constellation labs are not offered in the planetarium after **Thursday, December 3, 2015.**
- Mini-exams: **September 11 - December 10, 2015**
 - There are 15 Mini-Exams due throughout the semester. Due to the placement of the add/drop deadline, the first Mini-Exam is due **Friday, 11 September, 2015.** This is the first instance of a deadline

where you should **NOT** be waiting for the deadline in order to complete your assignment. Remember, that most of you will have been participating in the class activities for a full two weeks by the time this deadline arrives. Also, do not forget that only the top 10 scores for the 15 Mini-Exams will count toward your final grade in the course. The first 11 of the Mini-Exams will be due on the 10 consecutive Fridays starting with Mini-Exams two and three on **18 September 2015**. Things get a little bit tight near the end of the semester with the Thanksgiving holiday and so I have the Mini-Exam 12 deadline set for **Wednesday, 11 November 2015**. The deadline for Mini-Exam 13 is on **Tuesday 23 November 2015**, which is just before the Thanksgiving break. The deadline for Mini-Exam 14 will be on **Thursday, 3 December 2015** and the last day for Mini-Exam 15 will be on **Thursday, 10 December 2015**.

- Review Assignment 1: **28 September, 2015**.
 - Turn in Review Assignment 1 at least a few hours before the 2nd Checkpoint.
- 2nd Checkpoint: **2 October, 2015**.
 - Remember to schedule your checkpoint appointment in advance!
 - Be prepared to discuss your Review Assignment 1 with the TA.
- Review Assignment 2: **14 October, 2015**.
 - Turn in Review Assignment 2 at least a few hours before the 3rd checkpoint.
- 3rd Checkpoint: **16 October, 2015**.
 - Remember to schedule your checkpoint appointment in advance!
 - Be prepared to discuss Review Assignment 2 with the TA.
- Review Assignment 3: **16 November, 2015**
 - Turn in Review Assignment 3 at least a few hours before the 4th checkpoint.
- 4th Checkpoint: **18 November, 2015**.
 - Remember to schedule your checkpoint appointment in advance!
 - Be prepared to discuss Review Assignment 3 with the TA.
- Portfolio Assignment: **3 December, 2015**
 - The Portfolio assignment includes your Observing Projects, Sharing Your Knowledge Reports, and Self-Evaluation.

- Review Assignment 4: **10 December, 2015**
- Final Exam: **18 December, 2015.**

WARNINGS:

- You need to keep deadline dates in mind as you go through the course but also remember that all of the class deadlines are noted several times in the course materials that you will be using. Also, since five of the Mini-Exam scores are dropped during the semester, the class policy has been set and there are absolutely no opportunities for makeup versions of Mini-Exams. A review version of each of the Mini-Exams will be posted at the expiration of the exam period as a study aid.
- This class has an open schedule and any items can be completed earlier than the given deadlines. Since all assignments can be turned in early and review assignments can be worked on for several weeks before submission, there will be absolutely no exceptions given, for any reason, to the listed deadlines. The university discontinuance policy is in place to handle the occurrence of serious or even catastrophic events.
- It is not possible to receive credit for the constellation quiz if you miss the deadline. Decades of experience have demonstrated that the average score on the constellation quiz is greater than 90% after attending just two of the labs to learn and practice. I encourage you to get this easy credit early in the semester before you get too busy.
- Enrollment in online sections allows you all of the benefits of taking classes during the regular semester, and due to this fact, all course work must be submitted by the last day of classes (10 December, 2015) and the last day to take the final will be on the last day for final exams (18 December, 2015). Once again, these are absolutely final deadlines.

Course TA Information

Your TA for this course is **Pam Lara**. Please contact your TA if you have any questions, run into difficulties with the course, and to schedule checkpoints.

- Again, her name is Pam Lara.
- ta_phscs127@byu.edu
- 801-422-4043

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Remember, your TA is your first line of contact, and will be able to help you with any issues that come up. She is looking forward to getting to know you!

Department of Physics and Astronomy Learning Outcomes for Physics 127

1. Students will be able to answer conceptual questions using correct astrophysical terminology about the following core astronomy concepts:
 - the motion of the Earth and the objects seen in the visible sky
 - how and into what the Universe is organized by gravity at all scales from the solar system to the superclusters of galaxies.
 - the significant and unique characteristics of each planet and other components of the solar system.
 - the essential physical concepts that govern the life cycle of stars from creation to death, how the Sun compares to other stars, and the changes the Sun and stars will go through during their life cycles.
 - the structure and classification of galaxies and clusters of galaxies.
 - the central ideas of and evidences for current big bang cosmologies.
2. Students will be able to identify common naked eye constellations, bright stars and deep sky objects in the sky.
3. Students will gain practical experience by performing their own Astronomical observations, interpreting their observations and communicating their results.
4. Students will appreciate the grandeur of our Savior's universe.

Your Goals for Physics 127

1. *Learn about the nature of the Universe:* Remember, the Universe comprises all that we can currently observe and many other things that we have not yet managed to see even with our most powerful instruments and tools. You will also find that the Universe contains many objects we are now able to observe for the first time in history. Thus, this first objective should not be taken lightly. Even though this is a descriptive level class, when the subject matter is the entire Universe it means that you should expect to experience plenty of new ideas.
2. *Be an observer:* Most people are unaware of how much you can observe about the Universe without the aid of modern technology. These observations can be made easily by knowing where to look and investing a little time. Many of the observing projects in this class are designed to help you learn more about the night sky and how to recognize what you see.
3. *Understand how the principles of physics apply to astronomy:* You will learn how astronomers are detectives. They discover the nature of stars and galaxies by applying the laws of physics to faint glimmers of light seen from Earth. They use scientific reasoning to deduce the conditions that exist in places we will likely never be able to visit. It amazes me that during the few decades I've been involved with astronomy and astrophysics, technology has made many advances that allow us to actually witness events and conditions that were previously regarded as only theory. The Great Observatories Program from NASA has allowed scientists and astronomers to observe many celestial objects that had been proposed just a few years before. Today, it is not uncommon to observe events that were considered beyond the reach of technology just a decade ago. It is gratifying to know that as scientists propose many complex new theories, technology enables us to confirm that we understood many of them correctly!
4. *Gain an accurate understanding of how astronomers gain knowledge:* I want to be clear right from the start: I do not accept everything I read in various astronomy books and journals. Just like any other science, the material on the frontier is not considered to be absolute truth. It is the best idea that we have at the present time. It may change tomorrow or the next day. In fact, over the past couple of decades I've seen these changes occur many times. Please remember that the current changes usually concern small points of detail or minor modifications. At the present it seems unlikely that there will be a major scientific revolution concerning the fundamental nature of the Universe. I truly believe we are living in a "golden age" for astrophysics and cosmology. What was considered wild speculation just a decade or two in the past is now part of a rigorous

science that is continually being confirmed with amazing regularity by new experiments. What a wonderful time to be a scientist or a student! It is truly amazing that we are able to determine so many things just by being clever. What I want you to take from this course is the realization that, through the use of natural laws and the ability to think and reason, we can learn a great deal of information about places and objects that are so remote we will never have an opportunity to actually visit them. This information is not imaginary, but rather represents a great achievement for all of mankind.

How to Succeed in This Course

Since this is an online class, I would like to remind you that most successful distance learning students find that they must study carefully and learn to wisely budget their time. This is a new experience for many students. Even advanced students who have taken many classes at the university level are often surprised by the amount of effort and discipline required to complete an online course. You will not get a less rigorous version of this class by taking it online. I have carefully made sure that the material presented in this class is as close as possible to what is discussed in regular sections presented on campus.

I have made certain that all the answers to questions in the submitted lessons are not given word for word in the text. There will be a few questions per submission that you will have to figure out yourself by extending some fact that was explained in the lesson. Actually, you need to remember my comment about how astronomers rely on logic to deduce the nature of things unseen. I want the course to reflect this fact, so I have left a few puzzles for you to solve. You will find that most of the more challenging questions will be in the submitted lessons. These, along with the mini-exams, will provide material for the final exam. If you are stumped by a question, remember that it is just one question out of several hundred. It will not be the end of the world if you miss a point here and there. The Speedback format adopted in this class for the submitted homework lessons allows me to provide you with brief feedback on each question that gave you trouble, and makes it so your lessons assignments are processed in the shortest time possible.

Please don't be afraid to think for yourself. Remember that is one of the major goals for this course. Also, remember to use your resources. I do get just a little irritated when I provide extra material in a discussion section and a student writes me a message about how unfair a question is because it is not in the book.

I feel that the time I took to provide extra materials gained from my experience through decades of work as a research astronomer is wasted if students will not read my comments.

The textbook for this course is a superb reference. A word of advice to students that I often repeat is: do not hesitate to use the glossary, the index, and the appendices as you search for an answer. Further, my campus lecture notes are also provided in this course. These are the PowerPoint notes that I use in class. They have been converted to short video clips that usually run less than five minutes. There is no audio component to these clips but they do contain most of the visuals that I use in class presentations. I believe the best way to use these is to use the pause button and go through each sequence slide by slide and make sure that you understand why that particular graphic was used to illustrate a point in a specific section of material. The ideas that I emphasized in class are going to be the same ones that you will be questioned on at various points in the course. With all this different material, you literally have the entire class available just as it would look on campus. The only major difference is that you can't see what kind of goofy astronomy shirt I might be wearing to class each day!

Course Requirements

Again, remember not to make the mistake of thinking that you will get a watered-down version of this course since it is done through distance learning. The truth is that you must complete exactly the same material that the BYU Physics Department offers in the regular on-campus version of the course. The difference is that you must read the text carefully and repeatedly in order to make up for the lack of classroom lectures. It is really convenient to be able to go through the material on your own schedule. However, you need to be careful and not fall behind in your schedule to the point where you no longer have enough time to work through the material so that you understand the underlying physical concepts. You're fortunate to have access to student tutorial labs on campus, but you must also study the text and do your best to complete the assignments. Personally, I have three expectations for you in this course:

First, I expect you to put forth your best effort. This includes scheduling enough time to master the material in each lesson.

Second, I want you to remember to use all of the course resources at your disposal. These include items such as the posted lecture notes, the textbook (including the glossary and appendices), and links to various online resources such as the NASA Astronomy Picture of the Day.

Finally, since this is an online course, I expect you to experiment with some original or novel ways of looking at the coursework. I also expect you to budget your time so that you reach the goals you have set for this course and your program of study. Remember that this method of taking classes is convenient, but that does not make it easy.

Prerequisites

Since this is a descriptive level course, you are not expected to bring with you any prerequisite skills or special talents in order to achieve success by the end of this class. I want to make it clear that this is **not** a class that requires use of higher math skills. This does not mean that you will not be asked to add, subtract, multiply, and yes, maybe even divide a few rather large numbers as you move through the lessons. You will find it easier if you can use scientific notation and if you understand what is meant by the logarithm of a number. Some things are just easier if you have these skills. However, you will still be able to do just fine even if these ideas are not part of your skills. I will make a real effort to explain things that are a little more confusing. You will not be expected to utilize any mathematical techniques aside from basic arithmetic in order to answer any of the questions that you will encounter on the final exam. For 95% of the questions, you will not even need arithmetic.

In general, astronomy is not studied in great depth until students have completed an undergraduate degree in physics and enrolled in graduate school. Once again, remember this is a descriptive level course and I will not require you to master the many mathematical intricacies of astrophysics. I'm aware that some students have very high levels of anxiety. Even being asked to plug a couple of numbers into a formula can seem traumatic. Please bear with me. I do this for a reason and I hope you will see that the reason lies just below the surface. If you miss the deeper meaning of some concept, remember, it is okay. However, the argument that the course's description is contradicted by having to measure an angle or perform simple arithmetic is not acceptable.

Time Requirements

I feel that it is not possible to do well in this course without working hard for at least two months. I will allow you to move as fast as you like; however, please be aware that you do so at your own risk! You may move through this course as rapidly as you wish, you cannot complete the course before 15 October, 2015.

Additionally, please do not try to alter the organization of the course. You should submit your exams and assignments in the proper numerical order. Your work is tracked and recorded by the program used to administer online classes. It is really important that you follow the instructions provided in the class. If you submit lessons any other way, they can be lost. *Under no circumstances should you try to send assignments and exams directly to me.* If you do this, there is no record or copy of your submission and I am unable to enter a grade for any lesson that has not been marked as officially received.

Course Materials

The textbook for this course is:

Freedman, Roger A., Robert M. Geller, and William J. Kaufman. 2011. *Universe*. 9th edition. W. H. Freeman and Company.

Read the Text!

I have been working with on-campus and distance learning students at BYU for more than thirty years and in that time I have come to realize that a great textbook is likely the most valuable resource that I can provide to help a typical student succeed in the a course. Also, due to the format of most distance learning or online classes, it is important to use a book that is packed with the most current information available.

The official textbook that I use for this class is *Universe*, 9th edition, by Roger A. Freedman, Robert M. Geller, and William J. Kaufmann, III. This textbook is absolutely ideal for both the on-campus and Independent Study versions of the course. The astronomy professors at BYU have tried using several of the smaller textbooks for the descriptive astronomy course. For the most part, these have been a disappointment because they often leave most students with too many unanswered questions. The textbook we have ultimately chosen for this course is revised every few years, but it ages well.

Please be aware that the textbook goes into far more detail than you will need to get an "A" in this class. This textbook is a wonderful reference. If you enjoy this material, you may want to keep this book in your library as a reference for many years in the future. I took special care to select a textbook that would be able to provide almost any answer a student might want answered. I realize that many of you live in relatively isolated areas and you can get discouraged very quickly if

there is no place to find answers to questions. I know that the Internet brings many references into our homes, but the book is still nice to keep handy. I hope you will find the textbook and the supplemental material to be user friendly.

You will do much better in this class if you take the time to read the material in this course and in the textbook. Do not try to skip the reading in the course. If you skip that material, you are going to miss important ideas and much of the supplemental material that I have included to make the class a little less difficult. I have selected the assignment questions to be similar and sometimes even identical to what you will find on the final exam in this course. I have included optional reading comprehension quizzes that cover each chapter in the textbook. I find it unfortunate that the majority of students interpret “optional” as meaning “this is material that I can skip.”

I cannot emphasize enough how much I feel that reading the text is the real key to success. I know that most students do not make a habit of actually reading textbooks. Students generally get through a course by listening and taking notes during classroom lectures. There is nothing especially bad about this habit; however, it does take away some of your potential as a student. I found this to be true many years ago when I took a course in calculus through what was then called BYU Home Study. For the first time in my academic career, I found I had to read a textbook—there was no getting around that fact. I had always been a very good student, but I found that I had no idea what was going on in the course unless I read the book and worked the problems. During this time, I made another discovery: many of the textbooks I had were pretty well written and contained many helpful hints.

There are always some typos in the various editions of the text, but there is no need to report those to BYU, as there really isn't anything we can do to correct those. If you find a typos or mistakes in the online materials, please let us know so that it can be corrected. This is especially helpful in the current electronic version of the class because it is possible to make quick and easy modifications.

Other Resources

You will find that I often reference articles and pictures that have been archived on the [Astronomy Picture of the Day](http://antwrp.gsfc.nasa.gov/apod/astropix.html) (<http://antwrp.gsfc.nasa.gov/apod/astropix.html>) website. This is a fantastic reference to a wide variety of topics related to astronomy, many of which we will cover during this course.

Another valuable resource at your disposal is in the course itself. These materials have been prepared through Independent Study to provide a collection of visual aids in one place. These are intended to help clarify some of the more difficult concepts in the course. Of particular note, you will find an [electronic star chart \(../Media/Flash/final2.swf\)](#) that will be especially helpful in learning the constellations.

Additionally, this course contains the lecture outlines and notes derived from the campus lectures. I realize that I can't force you to use any of the material for the class, but I strongly suggest once again that you make an effort to stay current with new discoveries. Finally, using these materials will certainly help you understand some of the more complex ideas covered in this course.

Course Organization

I have divided this course into 25 lessons. The course is designed using a model known as the assessment track. That is because I know exactly which concepts I want to deliver in this course, and I have more than thirty years of experience testing students on these concepts. Each of the lessons is organized into several sections, including the following:

Discussion Material: The discussion material in the course will be helpful as you study the science of astronomy. This is where I have a chance to add some of my experience and insight into the subject. I am not able to compensate for the lack of classroom lectures; you will still need to get through most of this on your own. However, in the discussions I will do my best to supplement some of the areas where I find the text a bit hard to follow, and I will discuss some of the general ideas that have always interested me as I have studied physics at various levels. Also, I will use much of the discussion material to give you hints and ideas about how to keep the concepts straight in your mind.

You will quickly find that my discussion material will illustrate a concept that you will see on one of the mini-exams or the final exam. I apologize in advance that the discussion material is often quite brief. I have taught these classes on-campus and online for more than thirty years, and I have found that, aside from writing a textbook in my own style, there is really nothing I can tell you in a lengthy discussion that will make the concepts any less gruesome. Unfortunately, this is just the nature of most courses in the physical sciences. It is a conscious decision on my part to use the discussion material in order to leave you lots of hints about the concepts that I consider to be important for anyone completing a college level astronomy course.

Reading Comprehension Quiz: There is a reading comprehension quiz for each lesson. You will be able to evaluate your knowledge of each lesson by grading these exercises and looking up the answer to each question you missed. Because we cover such a great amount of material in this course, I feel strongly that it will better help you study for the exams if the reading comprehension quizzes are grouped together at the end of each lesson. At times, you will find that the questions are **not** in the same order as they are presented in a chapter or group of chapters from the textbook. This is also to help get you accustomed to the wide variety of questions that you will be asked on the exams.

These quizzes are included to test your understanding of what you read. They do **not** count towards your grade and in some cases include a little more material than what you will be tested on. But if you can do well on these quizzes, odds are you understood what you read well enough to do well on the exams. It is important to learn the new vocabulary of astrophysics so that you are not intimidated by the words alone.

Observation Projects: This portion allows you to do some "hands-on" astronomy. There are several suggestions for clear-sky observing projects as well as instructions provided for you in the Sky Observing Projects page. You must complete 4 of them and submit them as a portfolio before you take the final exam.

Sharing Your Knowledge Options: This portion of the lesson includes ideas for how you can share what you have learned in that lesson with those around you. As an assignment for the course, you must complete a minimum of six of these Sharing Your Knowledge activities and submit a paper describing what you did. It is important to note that these assignments are **not** book reports. You are asked to report on how you have shared your knowledge of a subject. This will be discussed further in the Assignments and Submissions section.

Study Guide: The purpose of this section of the lessons is to provide you with a basic summary of the key words and ideas from that section of the course. If you can look at those terms and feel comfortable with the ideas behind them, that will be a good indication that you have successfully understood the material covered in that lesson. I recommend using this section to help review and study for the final exam.

Assignments

I cannot stress enough the scope of the material for this course. I suspect that you will find it fascinating, exasperating, and enjoyable; though I realize that this is a pretty strange combination. Since your topic for this course is the Universe, you will find that you must acquire a basic understanding of several hundred terms and processes that are probably now unfamiliar.

Constellation Quiz

For this section of BYU semester online, you will take this quiz in the Royden G. Derrick Planetarium (C465 ESC) , and your TA will receive your answer sheet and enter your grade in the online Gradebook.

Note: You can take this quiz beginning the second week of the semester. Due to schedule constraints at the end of the regular semester, the constellation labs are not offered in the planetarium after **Thursday, 3 December, 2015.**

Online Assessments

You will complete and submit these assignments online.

Review Assignments

Four times during the course you will submit review assignments. As I've mentioned, you will likely see these questions again. All of the questions in the course will be of the multiple-choice or matching variety. My goal is to make sure that by the time you take the final exam, you will have seen all of the concepts before and there will be no surprises. In fact, many of the questions on the exam will only be changed superficially from what you have seen in previous lessons, and many other questions will be exactly as you have seen in previous lessons and submissions.

Mini-Exams

As you complete this course, you will have the opportunity to complete fifteen un-proctored, computer-graded mini-exams that will provide you with a series of questions that are similar to what you will find on the final exam.

The mini-exams have a 30-minute time limit, so be sure that you have thoroughly studied the material before you begin. The vast majority of students complete the Mini Exams in less than 15 minutes.

Your **ten highest scores** on the fifteen mini-exams will count for a total of 20 percent of your final grade.

The questions on the mini-exams, along with your four review assignments, will provide an excellent resource for you to use as you complete this course and prepare for the final exam. I have written these questions to teach you the new concepts and vocabulary that you should master as you complete this descriptive astronomy course.

Portfolio

These written assignments will all be part of a portfolio that you build as you work through the course.

To make sure that I can open and read your portfolio, please save all of your documents in a .DOC or .DOCX format.

Use the course number, your first and last name, and the assignment name for the filename. For example, "PHSCS127_MikeJoner_Portfolio.docx."

Observation Project Reports

You will need to complete **four** observation projects to receive full credit for your portfolio. I have given you plenty of choices in the Sky Observing Projects page that follows the syllabus. **At least two of the projects must be from the "clear-sky" selections.**

You will need to decide on your observing projects early in the course. I think the best time to start these projects is in lesson 2. I think it is easy to complete some basic observing projects but I always have some students decide they are not going to do projects. You need to realize that not completing the projects means giving up an easy 8 percent of the total points for the course. It is not possible to get an A in this class if you do not do the observing projects.

Sharing Your Knowledge Reports

I have included a "Sharing Your Knowledge" assignment in each of the 23 regular lessons. These are designed to get you thinking like an astronomer and teaching others about these ideas. It is also a good way to solidify these relevant, often new concepts in your mind. As part of your final portfolio, you will be expected to write about what you have learned from **six** of these experiences. When saying this is a writing assignment, I want it to be clear that I am not expecting a formal, book report-type of paper from you. Rather, I want you to explain what you have learned and what your teaching experience was in completing the Sharing Your Knowledge assignment with another person.

Self-Evaluation

You will also be required to submit a self-evaluation with your final portfolio. In this self-evaluation you should give yourself a score out of fifty points based on how you feel you did throughout this course. Let me emphasize that you are expected to provide a **score out of 50 points**—not a percentage, and not a letter grade. Along with this score, your self-evaluation should also include a short, one-page report that describes your effort in this course, why you feel you deserve the score you gave yourself, what you learned, what you enjoyed, what went well, what went bad, and so forth.

Note: This portfolio must be submitted in lesson 25, **before** you request the final exam. I think my system is really fair because only 30 percent of your grade is based directly on a formal exam. Note that the projects and papers are **required** to complete this course. You will be allowed to turn in blank assignments. However, giving up 20 percent of the total possible points for the course will absolutely lower your final course grade to a level that will not be pleasing. Finally, if I find projects or reports that are just copies of materials from some Internet site, I will issue a failing grade for the course.

Final Exam

At the end of the course, you will be tested on all of the material you have covered in a comprehensive final examination. This exam includes 150 matching and multiple-choice questions.

The final consists of multiple-choice and matching questions selected from the Review Assignments and Mini-Exams. The final exam questions will be mixed up a bit, but will essentially be the same as questions you have already experienced. There will be no new material introduced on the final exam.

Grading Procedures

Two lessons in the syllabus are roughly equivalent to one week of work in the regular on-campus sections of this class. Here are the grading percentages for each assignment and exam:

Assignment/Exam	Value
Review Assignment 1	3%
Review Assignment 2	3%
Review Assignment 3	3%
Review Assignment 4	6%

Constellation Identification Quiz	10%
10 highest scores out of 15 mini-exams	20%
Portfolio:	
4 Observing Projects	8%
6 Sharing Your Knowledge	12%
1 Self Evaluation	5%
Final Exam	30%

The grades you receive on the four review assignments count as 15 percent of your grade. Each of the assignments is labeled with a value. The last assignment you submit is worth more than the others because it is a longer, comprehensive review for the final exam.

Your best ten scores from the fifteen mini-exams you will take throughout the course will be worth a total of 20 percent of the course grade.

The constellation-identification quiz that you take in the planetarium (C 460 ESC) will be worth 10 percent of the overall course grade.

The final exam will be worth 30 percent of the course grade.

The remaining 25 percent of your grade is based on your portfolio that includes the observing projects, the papers you will submit about the “Sharing Your Knowledge” assignments, and the self-evaluation. That 25 percent is divided as follows:

- the four observing projects you will submit are worth 8 percent of your grade
- the six “Sharing Your Knowledge” papers will count for 12 percent of your grade
- the Self-evaluation is the final 5 percent of your grade

Grade Scale

The grading scale is as follows:

A	(100-93)
A-	(92-90)
B+	(89-87)
B	(86-83)

B-	(82-80)
C+	(79-77)
C	(76-63)
C-	(62-60)
D+	(59-57)
D	(56-53)
D-	(52-50)
E (fail)	(49 and below)

Getting Help

If you need assistance as you're working through the course, there is help available: your TA is ready to answer any questions you have.

Please contact your TA at ta_phscs105127@byu.edu. (You can also make an appointment to come in person if you live conveniently close to BYU campus.)

For the online course sections, it is not a good idea to contact your instructor directly; I won't be able to give you immediate attention. On the other hand, your TA, Pam, has many hours scheduled each week where she will be able to devote time to answering your questions.

Additionally, the BYU semester online astronomy students can use the services of the astronomy lab. There are TAs available to answer your questions in the on-campus tutorial lab located in the astronomy library, N485 ESC, during scheduled hours. They should be able to provide assistance with any of the astronomy concepts that you encounter in this class. A schedule of times and days for astronomy TA help, constellation labs, and observation deck TA help will be posted in the class materials immediately following this syllabus during the first week of the semester.