

INTRODUCTION TO ASTRONOMY

Tuesday & Thursday | WEL 3.502 | 12:30p-1:45p

Zoom Synchronous Meeting Room: <https://utexas.zoom.us/j/95314992454>

Instructor

Prof. Steven Finkelstein

My pronouns: he/him/his

stevenf@astro.as.utexas.edu

Help Sessions:

via Zoom (for now)

<https://utexas.zoom.us/j/93137148512>

TBD

Teaching Assistants

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Help Sessions:

TBD

Srivats Parimal

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Help Sessions:

What is intro to astronomy about?

This introductory course for non-science majors will survey all of astronomy, starting with the ancient Greeks and how their studies led to the correct model for the Solar System, moving on to studying other stars and planets. We will finish with learning about our own Milky Way galaxy, and peering back into the early phases of the Universe to see early galaxies and understand the Big Bang. By participating in this class, ***you will develop*** an appreciation for astronomy and the night sky around you. ***You will improve skills*** in critical thinking, communication and teamwork.

This course carries the ***Quantitative (QR) Reasoning flag***. QR courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

Course Learning Objectives: You will...

Develop a broad understanding of the nature, scope and evolution of the Universe, and where the Earth and Solar System fit in.

Improve your critical thinking and quantitative reasoning skills, and their importance in the context of the scientific process

Learn that science is a process, the world is knowable, and we come to know it through observations, experiments and theory.

Get acquainted with the history of astronomy and the evolution of scientific ideas (science as a cultural process).

Gain a familiarity with the night sky and how its appearance changes with time and position on Earth.

Each class period will have learning objectives linked to one or more of these course goals

Email Policy: I can be emailed any time for questions of a personal nature. For questions about class content or logistics, you ***must*** first post the question to the canvas discussion board. If no one answers after 6 hours, or five people chime in to say they have the same question, you may email me or a TA, including a link to the discussion.

Required Materials:

Good news, there is only one thing you need to buy for this course! It is **Lecture-Tutorials for Introductory Astronomy, 3rd Edition**, by Prather, Slater, Adams & Brissenden. Do not rent or buy used. Available at Coop or online. You also have the option to purchase an e-version. It is slightly cheaper, but you'll either have to print it, or make your notes on a separate sheet of paper.

<https://pearsoncollections-store.vitalsource.com/products/ast301-ut-austin-s-finkelstein-steven-finkelstein-v9780137101405>

Your *optional* reference text for this class is available for free online, in web view and PDF: **Astronomy from OpenStax**, ISBN 1938168283 **Link: www.openstax.org/details/astronomy** If you prefer a print version, you can purchase that from Open-Stax on amazon.com, but web view is recommended - the responsive design works seamlessly on any device. If you buy on Amazon, use the link on your book page on openstax.org so you get the official OpenStax print version.

A device for the InstaPoll *in-class response system* - we will be piloting a UT-developed **free** system through Canvas. Have ready a device which will allow you to respond to my questions.

Class recordings: These are reserved only for the use of members of this class (students, TAs, and the instructor) and only for educational purposes. Recordings should not be shared outside the class in any form.

What is expected of me in this class?

- Attend class and **participate!** Work collaboratively and be prepared to share your ideas. *If you're not comfortable working with others, this is not the 301 for you.*
- Complete all assigned online modules on time. Make sure to take time to think deeply about the videos, and spend time with the book or come get help if you have questions!
- Don't procrastinate on the projects! Everything you need to know is in this syllabus, so get them done early!
- Take advantage of us! We are here to help you!

What happens in lecture?

- Not much lecturing! I have designed this class from the ground up to be very interactive, focusing on your attainment of the course learning outcomes. You will be exposed to the content outside of class through Canvas homework modules, which replace the typical lecture component.
- While I ultimately hope we can all be in person, early in the semester we will operate the classroom at reduced density, and simultaneously broadcast the class on zoom.
- In class is time to work! We will review concepts you've learned prior to coming to class through Canvas homework modules, and you will work with your peers in class or in Zoom breakout rooms to practice these concepts with engaging activities.
- You will only learn if you participate, thus attendance and participation are **required!** Students distracting or not participating will be asked to leave.
- A typical class day will be composed of the following:
 - Astronomy in the news – submit at the start of class.
 - Review of homework questions
 - Several think-pair-share and discussion questions.
 - Answering questions from you about the topics which may still be unclear.
 - Activities in groups, followed by whole class discussion.

Classroom Safety and COVID-19

This is a science classroom and we are strongly recommending that we look to the science and follow the guidance of local public health officials and the CDC. Wearing a mask indoors is strongly encouraged, even if you are vaccinated, especially while Austin is in Stages 3 or higher, as masks efficiently reduce the spread of COVID 19. ***To help preserve our in person learning environment, the university recommends the following:***

- Adhere to [university mask guidance](#) and follow the recommendations of the CDC. ***Our class will be the most successful if we all protect and respect each other and wear a mask.***
- ***Vaccinations are widely available***, free and not billed to health insurance. The vaccine will help protect against the transmission of the virus to others and reduce serious symptoms in those who are vaccinated. The vaccines are safe, and effectively prevent against severe illness from COVID-19.
- If you are experiencing any symptoms of COVID-19, please follow university guidelines here: https://healthyhorns.utexas.edu/coronavirus_exposure_action_chart.html, including getting tested. If you test positive, you should isolate yourself at home. Contact the [Behavior Concerns and COVID-19 Advice Line \(BCCAL\)](#) to report your positive result. BCCAL can also assist you with isolation options, class absence notification or other support. and if you find out that you have a positive test for COVID-19.
- If you are experiencing any symptoms of COVID-19 ***do not come to class in person***. If you are well enough to attend via zoom, please do. If not, you can use one of your six drops.
- ***Proactive Community Testing*** remains an important part of the university's efforts to protect our community. Tests are fast and free, and I recommend testing at least once weekly.
- Visit protect.utexas.edu for more information.

Blended Modality

In an effort to maximize learning and safety for everyone, through September 20th, and likely beyond, I will teach this class simultaneously in person and online. The classroom will operate at a ***maximum of 50% density***. I am working on the specifics, but likely you will be assigned the opportunity to attend in person on Tuesday *or* Thursday.

In-person attendance: On your designated in-person day, you have the option to attend in person, though you may also choose to attend via zoom. The seating chart we will use is at the end of this syllabus, and I will share on Canvas. The first row will be closed except to TAs. In all subsequent rows, you may sit in every other seat, occupying the first seat on the left side when in the front of the room facing the rear. When it is time for group work, in the class I will ask you to work with one person near to you, still keeping one empty seat between you.

Zoom Attendance: On your designated virtual day, log in via zoom and ***do not attend in person***. I will run zoom from my laptop, sharing my screen so you can see my slides, and using a microphone so you can hear me both in the classroom and online. One TA will be tasked to monitor the zoom, and let me know when you have questions (which you can ask in the chat, or using the "raise hand" feature). When it is time for group work, this TA will open breakout rooms. Please find a room with 2-3 other people.

Contact Tracing: To assist with contact tracing efforts, we are asked to keep a daily seating chart. To allow you freedom to sit where you like (within the bounds above), I will facilitate this via instapoll. Each class day, I will have a short-answer instapoll question where you will identify your row letter and seat number, and answer the question. If you are on zoom, please answer "zoom". ***This question will count***

towards your participation, so make sure to answer it. I will only share this data with University Health Services if they request it.

Expectations regarding mutual respect: Astronomy belongs to all people, independent of race, religion, gender, gender identity, gender expression, or sexual orientation. Incidents of discrimination, assault, harassment, threats, intimidation, profiling, or coercion based on membership or perceived membership will not be tolerated. Show each other respect no matter perceived knowledge or performance in this class, or any other.

Zoom Etiquette: All classroom norms apply when in a Zoom session. If you wouldn't do something in a physical class, don't do it in a digital classroom. Please dress similar to how you would in a university classroom. Please ensure that your microphone is working before class. You will be working with other students in breakout rooms during lecture periods and conversing with your classmates will be an important part of the experience. **Mute your audio whenever you are not speaking.**

Video: I encourage you to keep your video on when in the main classroom to help us maintain a personal connection (this is especially true when in small breakout rooms). When in breakout rooms, you are required to have your video on, unless you email me ahead of time letting me know of your reason for why you cannot use video. You may use video and Zoom backgrounds if your device allows, but they must be appropriate. If I ask you to change your background, you must do so immediately.

Breakout Rooms: Breakout Room discussions should be structured and on topic. Take turns sharing ideas without a single person dominating the discourse. The teaching assistant will be dropping in at random to listen in, promote the discussion, and answer questions.

How is my performance in this class assessed?

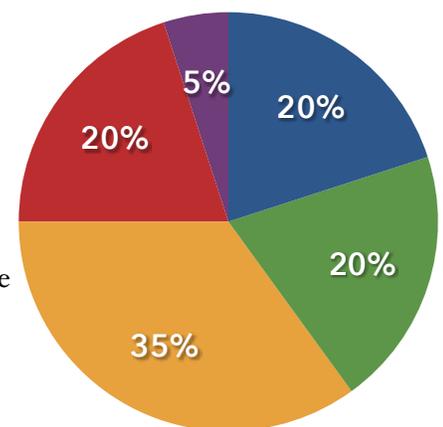
What is the grading scale?*

93.0 - 100 A
 90.0 - 92.99 A-
 87.0 - 89.99 B+
 83.0 - 86.99 B
 80.0 - 82.99 B-
 77.0 - 79.99 C+
 73.0 - 76.99 C
 70.0 - 72.99 C-
 67.0 - 69.99 D+
 63.0 - 66.99 D
 60.0 - 62.99 D-
 < 59.9 F
 *no rounding

Your final course grade will be determined as follows:

20% - In-class participation: You will receive credit for this component by answering in-class think-pair-share questions through InstaPoll on your device. As this component is giving you credit for participating in *all* in-class activities, it is not permissible to respond to instapoll when not logged in and engaged via Zoom. We will randomly check the zoom logs each class to ensure that you do not respond to Instapoll when you are not connected to zoom and participating in the class. This grade will be calculated as an average of the grade for each class, where each class grade is equal to the percentage of questions you submit an answer to. Although ***makeup participation points will not allowed***, I realize that you may need to occasionally miss class, or have a technical problem submitting a question.

- Participation (6 drops)
- Online Homework (2 drops)
- Quizzes (1 drop)
- Projects
- In-Class News Items



For this reason, Canvas will automatically **drop your six lowest participation class grades**. This large number of drops is to account for unexpected covid-related absences. **Should you miss a few classes due to COVID (or any other reason), there is no need to contact me.** Your zero grade in instapoll on those days will be dropped, and you can catch up on what you missed with the recordings on Canvas. Should illness or other circumstances cause you to miss three or more class periods in a row, please contact Student Emergency Services, and they will contact me for accommodations.

20% - Online homework modules: Online modules will be assigned to be completed before most classes, and will be due before the start of that class. These include one or more short lecture videos, followed by a multiple choice quiz. The point values vary with the length of the module. **Your two lowest homework grades will be dropped.** Any missed homeworks beyond those two will count as a zero. There is no late work accepted.

35% - Quizzes: Rather than a few big exams, we will have six quizzes. These will be held outside of class time, within a designated 24 hour period, administered via Canvas. These will contain ~10 multiple choice questions. These quizzes are non-cumulative, and will cover the contents of 3-5 class periods. Your lowest score will be dropped. If you miss two quizzes, then one will count as a zero. **In general there will be no makeup quizzes,** though if you are unable to take the quiz during the designated time due to a covid-related illness, please contact me to arrange an accommodation. The quizzes are open book - you can use your course notes and course book, but **you may not consult the internet or any other person** (e.g., do the quiz alone).

5% - Astronomy in the News: You will submit two astronomy news items that you have read throughout the semester. You will do this by creating a Canvas discussion post, providing the link to the article, and 4-5 sentences of description. I'll pick a few per class, bring up the website, and if chosen you will unmute (and share your video if you're comfortable) and explain your article to everyone, and moderate a short discussion. You must submit at least one news item by **October 14th**. The second one of each must be completed by **Dec 2nd**. See Canvas for details on where to look, and how to turn one in.

20% - Projects: There are four projects, each worth 5% of your total grade. Details will be listed on Canvas, but a listing of the projects is provided here with a due date (any can be turned in early!):

- Project #1 (due **Sep 23 @ 2pm**): Paper about a recent astronomy news item (not to be confused with the in-class news discussions, though you may use the same article for both). Due on Canvas.
- Project #2 (**due Oct 7 @ 2pm**): Moon Journal — Observe the Moon over the course of one phase cycle, and keep track of the phases in a journal. This can be turned in in-person, or scanned and submitted on Canvas.
- Project #3 (**due Oct 28 @ 2pm**): The Anti-Science Movement — You will investigate an anti-science movement (e.g., climate change deniers), explain the reasoning behind the believers, and show how the scientific method refutes their arguments. Due on Canvas.
- Project #4 (**due Nov 23 @ 2pm**): Diversity and Inclusion in Astronomy — You will learn about multiple women astronomers and astronomers of Color, and submit a creative report on their accomplishments. This can be turned in in-person, or scanned and submitted on Canvas.

Optional Astronomy Project - You may choose to complete this optional fifth project to add points to your lowest non-zero exam grade (your lowest grade is always dropped, so this can replace your second-lowest non-zero grade). You will pick a specific astronomical object or topic and find a creative way to present about it. This could be making an electronic poster; an infographic; a video or podcast, or something else even more creative. This is a chance for you to be creative, and spend time researching and thinking about astronomy from a perspective that interests you. We want you to learn and enjoy the experience, mindful also that the optional project can count as much as one quiz, so the work you put into it will be reflected in the grade you get out of it. More details can be found on the Canvas assignment. This is due no later than **May 4th**.

What are other policies on exams, assignments, and other course structure?

Course Website:

Canvas page for this course:

<https://utexas.instructure.com/courses/1313087>

Course Webpage: The course webpage on the Canvas system will be updated with course announcements, homework and reading assignments, and deadlines. It is your responsibility to check these on a regular basis. Please come to class prepared, having done the assigned module. Also please be prepared to participate in in-class discussions and activities, this is for your benefit.

Late work: Late work is not accepted. Makeup (or early) quizzes or exams are not offered. *However*, I understand that life events happen, so if you are unable to turn an item in on time or attend a quiz or exam, contact me ***in advance of the due date***. Note that being busy with other classes will not be considered a valid excuse. If you miss class for a sponsored University event, and you contact me ***in advance of the due date***, we can discuss accommodations.

Where can I find.. ?

Canvas will have:

1. Important announcements
2. Lecture slides
3. Weekly assignments and modules
4. Syllabus
5. List of Learning Objectives
6. Gradebook

Canvas will be our main form of communication, so check it regularly and stay up to date on assignments and communications.

Course Conduct: Please silence cell phones before you enter the classroom. ***No texting or using your cell phone*** during class except for use in specified classroom activities. Please do not pack up or leave class early unless you have talked to me in advance, as a consideration to us and your fellow students. Students may use laptops to take notes. Students found to be using their computers for non-class activities will be a distraction to those around them, and will be asked to leave, and will not earn participation for that day. If laptop distraction becomes a problem, I reserve the right to reverse this policy. ***Be respectful of others***, especially during in-class peer discussion times, and even if you disagree with them.

Be respectful of others, especially during in-class peer discussion times, and even if you disagree with them.

Extra credit: Other than the optional project (which can replace one non-zero exam grade), there are no opportunities for extra credit. Please don't email me at the end of the semester asking for additional points (this includes grade rounding!).

Students with Children: I recognize the difficulty of being a full time student with children. If you have children, or other family commitments, please come see me to discuss any modifications of the course policies which will maximize your success in this course.

Email: Email is recognized as an official mode of university correspondence; therefore you are responsible for reading your email for university and course-related information and announcements. Please check your email regularly and frequently.

Frequently Asked Questions:

What about technical difficulties?

If you have a technical problem that causes you to miss a class while on zoom, this is one of the reasons you get several drop participation grades. If you have a recurring computer or internet problem, please email me to help find a solutions. If **my** internet goes out during class, don't leave! I will log back in via my phone and continue the class (I will also strive to upload in-class lecture PDFs before class so you can follow along). If you have an technical glitch which causes you to miss an instapoll question, please send a zoom chat message to the lead TA **during** the class, and they will fix it.

Do you record the in-class lectures?

Yes! Although there is not much in-class lecturing, it may still be useful to review the video of our think-pair-share discussions, or the debrief after the lecture tutorials. This class is using the Lectures Online recording system. This system records the audio and video material presented in class for you to review after class. Links for the recordings will appear in the Lectures Online tab on the Canvas page for this class. You will find this tab along the left side navigation in Canvas. To review a recording, simply click on the Lectures Online navigation tab and follow the instructions presented to you on the page. You can learn more about how to use the Lectures Online system at <http://sites.la.utexas.edu/lecturesonline/>. I will also have the zoom recordings on hand when simultaneously doing zoom, though I expect the Lectures Online version will be preferable. I will also post a PDF of the lecture slides.

How do I succeed in this class?

The best way to succeed is to prepare and participate. Do the modules ahead of time, and take the time to watch them in full (and multiple times if needed). When in class, buy in and **participate!** The green book is *your* textbook and you are the author. If you don't work hard on it, you won't have it to study from!

How do I study for the quizzes?

- 1) Study the lecture tutorials. Don't just read them, re-do them! Cover your old answers, then check your new answers against them. Work in a group if you can!
- 2) Go over the in-class PDFs, and practice the think-pair-share questions.
- 3) Re-watch the relevant module videos, find concepts which you feel less secure on, find those concepts in the book, and read up.
- 4) Come to help sessions!!!

I missed a quiz, when can I make it up?

There are no makeup quizzes. The only exception to this will be:

- 1) If you have a major life event, **and you notify me ahead of time**. Depending on the situation, I may ask you to contact Student Emergency Services for assistance.
- 2) I am contacted by Student Emergency Services, and they request a makeup.
- 3) You are absent for a university-sponsored event, **and** you notify me ahead of time.

I'm sick, and can't come to class today, what do I do?

You don't need to email me! Stay home and get better (you can miss 2-3 classes, and still receive a full participation grade). Still do the module before class (late submissions are not allowed), and after class, download the PDF to see what you missed. Do the missed lecture tutorials, in a group if you can find some classmates, or on your own. If you have to miss multiple consecutive classes, please contact Student Emergency Services, and they will let me know if they feel you should be allowed to make up for missed participation.

I need to leave class early? How do I make sure I don't lose participation?

Participation is counted through InstaPoll. You will not receive credit for questions when you are not in class.

I forgot to do my homework before class, can I turn it in this afternoon?

No, late homework is not accepted. You get to drop your two lowest homework grades, so make sure it doesn't happen again!

I forgot to turn in my project! Can I turn it in this afternoon?

No, late projects are not accepted. Don't let this be you, turn it in early!

Its two days before the moon journal is due, and I haven't started!

There's nothing I can do to help you. Don't let this be you - do this early in the semester!

I got a zero in the gradebook for something I did or turned in!

We can make mistakes when inputting 200 grades! If you believe there is a mistake in the gradebook, stay calm, just send myself or one of the TA's an email, and we'll investigate.

University Resources:

Student Support: COVID-19 Updates and Information: This course may have changes, we all will need to be flexible with the learning environment depending on changing situations. But I will do my best to build in flexibility and options for you to be successful in this course. To help yourself, please explore the resources available here: <https://protect.utexas.edu/students-families/>

Academic accommodations (SSD): This class respects and welcomes students of all backgrounds, identities, and abilities. If there are circumstances that make our learning environment and activities difficult, or if you have medical information that you need to share with me, please let

me know. I am committed to creating an effective learning environment for all students, but I can only do so if you discuss your needs with me as early as possible. I promise to maintain the confidentiality of these discussions. Any student with a documented disability who requires academic accommodations should contact Services for Students with Disabilities at 471-6259 (voice) or 512-410-6644 (Video Phone) as soon as possible to request an official letter outlining authorized accommodations. For more information, visit <http://ddce.utexas.edu/disability/about/>. *I am also happy to meet in person virtually over Zoom to discuss more.*

Counseling and Mental Health Center: Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful. If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. <http://www.cmhc.utexas.edu/individualcounseling.html>

The Sanger Learning Center: Did you know that more than one-third of UT undergraduate students use the Sanger Learning Center each year to improve their academic performance? All students are welcome to take advantage of Sanger Center's classes and workshops, private learning specialist appointments, peer academic coaching, and tutoring for more than 70 courses in 15 different subject areas (including Astronomy). For more information, please visit <http://www.utexas.edu/ugs/slc> or call 512-471-3614 (JES A332).

University and Course Policies:

Academic integrity: The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties. Ethical conduct is expected at all times. For example, answering Voting Questions to receive credit when you are not in class is unethical. Incidences of academic dishonesty will be reported to Student Judicial Services. For more specific information go to: <http://deanofstudents.utexas.edu/conduct/academicintegrity.php>.

You are responsible for understanding UT's Academic Honesty and the University Honor Code which can be found at the following web address: <https://deanofstudents.utexas.edu/conduct/standardsofconduct.php>

- **Sharing of Course Materials is Prohibited:** No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, exams, papers, projects, homework assignments), in-class materials, review sheets, and additional problem sets, may be shared online or with anyone outside of the class unless you have my explicit, written permission. Unauthorized sharing of materials promotes cheating. It is a violation of the University's Student Honor Code and an act of academic dishonesty. I am well aware of the sites used for sharing materials, and any materials found online that are associated with you, or any suspected unauthorized sharing of materials, will be reported to Student Conduct and Academic Integrity in the Office of the Dean of Students. These reports can result in sanctions, including failure in the course.

- **Class Video Recordings:** Class recordings are reserved only for the use of members of this class (students, TAs, and the instructor) and only for educational purposes and are protected under FERPA. Recordings should not be shared outside the class in any form. Violation of this restriction could lead to Student Misconduct proceedings.

Plagiarism: As a research university, the University of Texas at Austin takes plagiarism very seriously. Do not risk getting involved in a plagiarism infraction - the consequences simply aren't worth it. Always cite your sources, and when in doubt consult a professor or librarian. You may also read more about plagiarism at the Student Judicial Services website: <http://deanofstudents.utexas.edu/conduct/academicintegrity.php>

Personal or Family Emergencies: If you experience a personal or family emergency (death in the family, protracted sickness, serious mental health issues) that prevents you from attending an exam or forces you to miss multiple days of class, you should contact Student Emergency Services in the Office of the Dean of Students <http://deanofstudents.utexas.edu/emergency/>. They will work with you to communicate with your professors and let them know of your situation.

Religious Days: A student who is absent from a class or examination for the observance of a religious holy day will be permitted to make up the missed work, if notice is given at least fourteen days prior to such an absence.

Core curriculum: This course may be used to fulfill three hours of the natural science and technology component of the university core curriculum and your successful participation addresses the following four core objectives established by the Texas Higher Education Coordinating Board: communication skills, critical thinking skills, teamwork, and empirical and quantitative skills.

Title IX: Beginning January 1, 2020, Texas [Senate Bill 212](#) requires all employees of Texas universities, including faculty, report any information to the [Title IX Office](#) regarding sexual harassment, sexual assault, dating violence and stalking that is disclosed to them. Texas law requires that all employees who witness or receive any information of this type (including, but not limited to, writing assignments, class discussions, or one-on-one conversations) must be reported. If you would like to speak with someone who can provide support or remedies without making an official report to the university, please email advocate@austin.utexas.edu. For more information about reporting options and resources, visit <http://www.titleix.utexas.edu/>, contact the Title IX Office via email at titleix@austin.utexas.edu, or call 512-471-0419.

Course Calendar:

#	Dates	Topics	Modules and Assignments Due Before Class	Quiz - Online after class	Optional Reading	In-Class Lecture Tutorials or Activities
1	Aug 26 (Th)	Introduction to Class	---		---	Scales (PDF)
2	Aug 31 (T)	Tour of the Universe	Module #0,1		Chapter 1	Ranking Tasks (PDF)
3	Sept 2 (Th)	The Celestial Sphere	Module #2		2.1, 4.1	Position, Motion
4	Sept 7 (T)	Motion of the Stars and	Module #3		2.1, 4.1	Path of the Sun

#	Dates	Topics	Modules and Assignments Due Before Class	Quiz - Online after class	Optional Reading	In-Class Lecture Tutorials or Activities
5	Sept 9 (Th)	Motion of the Sun				Path of the Sun
6	Sept 14 (T)	Seasons, <i>Practice Quiz</i>	Module #4	Quiz #1	4.2	Seasons
7	Sep 16 (Th)	Cause of the Moon	Module #5		4.5	Cause of Moon Phases
8	Sep 21 (T)	Predicting Moon Phases	Module #6		4.7	Predicting Moon
9	Sep 23 (Th)	Ancient Observables	Project #1			Observing Retrograde Motion, The Parsec
10	Sep 28 (T)	<i>Practice Quiz</i> , Copernicus and Kepler	Module #7	Quiz #2	2.2, 2.4, 3.1	Kepler's 2nd Law
11	Sep 30 (Th)	Kepler & Galileo	Module #8		---	Kepler's 3rd Law
12	Oct 5 (T)	Newton & Nature of Light	Module #9		2.3, 8.3, 8.4	Newton's Laws, EM
13	Oct 7 (Th)	Thermal Radiation, Atoms/Spectra	Module #10, Project #2		3.2, 3.3	Blackbody Radiation, Analyzing Spectra
14	Oct 12 (T)	<i>Practice Quiz</i> , Climate Change 1	Module #11,12,	Quiz #3	5.1-5.5	Greenhouse Effect
15	Oct 14 (T)	Climate Change Part 2	Module #13, 1st news item		7.1, 7.2	---
16	Oct 19 (T)	Stars	Module #14		16.1-16.3, 15.1-15.3	Apparent and Absolute Magnitudes, The HR
17	Oct 21 (Th)	Evolution of Stars	Module #15		17.1	Star Formation and Lifetime, Stellar
18	Oct 26 (T)	<i>Practice Quiz</i> & Doppler Effect	Module #16	Quiz #4	17.2, 17.3, 18.4	Doppler Shift
19	Oct 28 (Th)	Exoplanets #1	Project #3			Motions of Extrasolar
20	Nov 2 (T)	Exoplanets #2	Module #17		22.1, 22.4-.5, 23.1-.2	Detecting Exoplanets with the Transmit
21	Nov 4 (Th)	Exoplanets & Milky Way	Module #18		5.6, 21.3-21.5	Milky Way Scales
22	Nov 9 (T)	Milky Way, Galaxies	Module #19			Galaxy Classification
23	Nov 11 (Th)	Galaxies			25.1,25.2,25.4,25.6	Looking at Distant Objects
24	Nov 16 (T)	<i>Practice Quiz</i> & The	Module #20	Quiz #5	26.1-26.3	Hubble's Law
25	Nov 18 (Th)	Galaxy Evolution	Module #21		Chapter 28	Expansion, Lookback Time and Distance
26	Nov 23 (T)	Mysteries of the Universe	Project #4		---	---
	Nov 25 (Th)	Thanksgiving				
27	Nov 30 (T)	Beginning/End Universe	Module #22		Chapter 29	Making Sense of Universe, Big Bang
28	Dec 2 (Th)	End of Universe & Quiz 6 Practice	2nd news item, Extra project	Quiz #6	---	

50% Density Seating Chart:

