



PHYS 561 01W – ASTRONOMY AND ASTROPHYSICS FOR EDUCATORS ONLINE COURSE SYLLABUS: SPRING 2017



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In emails, please put "PHYS 561 Online" in the subject header. I will reply to emails within 24 hours (48 at weekends and holidays). **Note:** *I will exclusively use your TAMUC university email addresses for email communication.*

Course Time Zone: Central Time USA

Online Office Hours will be held Tuesday and Thursday 6:00 – 7:00 pm. I will be active during those times on the discussion threads, and you can also enter a shared video chat on Adobe Connect (I will email a link to the Adobe Connect Session just before each office hour).

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

The required book can be ordered from online retailers.

Textbooks Required

Ryden, B. and Perterson, B.M. (2010), *Foundations of Astrophysics*, Addison-Wesley, ISBN-10: 0321595580, ISBN-13: 978-0321595584

Course Prerequisites

Math: Students are required to know mathematics through Calculus 3 or equivalent, or have taken or be currently taking *Mathematical Methods for Educators Course* (PHYS 530). We'll be making extensive use of algebra, trigonometry, basic differentiation and integration, plus some occasional (simple) ordinary differential equations.

Physics: A course in calculus-based physics (sometimes called University physics) is required. Some knowledge of basic thermodynamics and statistical mechanics will be an advantage, but I will explain concepts from those subjects when we need to use them.

Course Description

Topics in stellar structure and evolution, galactic evolution and dynamics and cosmology will be studied, making use of real data, simulations and projects based on citizen science initiatives such as the Zooniverse that open up

astronomical research participation to the public. Prerequisites: University physics and calculus up to partial differential equations. (2015 TAMUC Graduate Catalog)

How far away are the stars and galaxies we see in the night sky, what are they made of, and how do they shine? How did the cosmos and its constituents come into being, and what does their future hold in store? These are the concerns of Astronomy (the measurement of the properties of the universe and its constituents) and Astrophysics (the application of the laws of physics, as best we understand them, to explain those properties); these two terms are often used interchangeably.

Astronomy and Astrophysics captures the public imagination like no other area of science. The latest pictures from our most powerful telescopes fill us with awe, but how well do we understand what we are seeing? The latest discoveries and breakthroughs are routinely reported in the popular media, sometimes without a full appreciation of the implications, or limitations, of the discovery. As educators it is important that we are able to accurately address such astronomical topics as they arise, particularly when curious students ask about them. To do that, we need a good knowledge of the current state of astronomical knowledge, and the physics at play in stars, galaxies and the cosmos. We also need to know what the good astronomy resources are to aid learning.

Astrophysics is a unique branch of physics in which the objects of study are not accessible to controlled experimental investigation in the laboratory; it is an *observation* driven science. We know what stars are made of, despite the fact that they appear only as points of light unfathomable distances away. We know the universe is around 13.7 billion years old, and originated in an intense fireball called the Big Bang, despite the fact that we can't travel back in time to check this out. It is important we understand how we come by this knowledge, and some of the techniques used in figuring it out.

The purpose of this class:

- 1) To give you a working knowledge of stars, galaxies and the universe, and how the laws of physics are applied to them. We will learn about how stars are born, live and die, how they live on after death as white dwarfs, neutron stars and black holes, and how they are organized on a large scale as clusters and galaxies. We will understand how to use the mathematical laws of physics to predict their properties, on the way learning useful techniques that can be applied to many other subjects, and even in everyday situations. We'll also cover some of the latest hot topics in astronomy and astrophysics, such as exoplanets, dark matter and dark energy.

2) To discuss how to present the topics we will cover to a high school audience, design lesson plans and explore the many tools available on the web to aid us. In particular, we will look at a number of citizen science projects, which allow the general public to participate in genuine astronomical research by analyzing real data, and learn about astronomy in the process.

3) To examine the education literature to understand the common misconceptions and difficulties encountered teaching astronomy and astrophysics, and use that literature to inform our own learning.

Student Learning Outcomes

At the end of the course students will:

1. Demonstrate mathematical reasoning skills that are particularly important in astronomy and astrophysics, such as order of magnitude estimating and Fermi problems.
2. Be able to apply the laws of physics to describe the structure and evolution of stars, galaxies and the universe.
3. Demonstrate an accurate knowledge of stellar structure and evolution, galaxy structure and evolution, and cosmology, and the methods and reasoning that allow us to deduce this knowledge
4. Summarize the ongoing arguments and progress at the forefront of astrophysics on topics such as dark matter/energy, the big bang, and exoplanets, in a manner understandable to the general public and high school students. Be able to accurately assess where the balance of evidence lies regarding these topics, and critically analyze articles and portrayals of astronomy and astrophysics in the popular media.
5. Create lesson plans which accurately and engagingly introduce astronomy and astrophysics principles to high school students, making use of internet resources including citizen science projects relating to astronomy and astrophysics.
6. Gain knowledge of the scope of astronomy education literature and understand what it has to say on astronomy misconceptions and conceptual difficulties.

COURSE REQUIREMENTS

Instructional Methods / Activities / Assessments

The details of the course structure are given below. Any changes will be communicated via email and announcements on LearningStudio (eCollege). Your TAMUC email account will be used at all times, and it will be your responsibility to check it regularly (at least once every 24 hours).

The course is organized into units; we will usually spend a week on each unit. An extra week may be added to a unit when extra time is warranted.

Introductory tasks and due dates

The semester starts at **12.01 a.m.** Tuesday, January 17th, which is when the introductory material and unit 1 will become available. Unit 1 will end on Sunday, January 29th at **11.59 p.m. (midnight)**.

To gain access to Unit 1 and the rest of the course, you must complete the following introductory activities which you can find immediately underneath the "Course Home" section:

- (1) Read the **Start Here** section near the top of the left side of **LearningStudio (eCollege)** to learn how to access course material and familiarize yourself with the environment.
- (2) Complete the **pre-course assessment**, which will be given again at the end of the course to measure Student Learning Outcomes 1, 2 and 3. This quiz *can only be taken once* and once you begin the quiz you will have *40 minutes* to complete it. The **pre-course assessment** is not graded, but it must be taken before you can gain access to the rest of the course.
- (3) Read the **syllabus**
- (4) Take the **syllabus quiz** to make sure you understand the mechanics of the course. This can be taken *any number of times*. The **syllabus quiz** will not be graded, but it must be completed *with 100% correct answers* before unit 1's material becomes available.
- (5) **Introduce** yourself to the class on the "**Class Introductions**" discussion thread.

NOTE: You must complete the pre-course assessment to access the rest of the class, and complete the syllabus quiz with 100% correct answers to access the first, and subsequent, units.

Regular unit tasks, material and due dates

The course material will be organized by unit. The unit's material will be located under the unit's tab in the left hand menu in LearningStudio (eCollege).

Unit 1 is available from the first day of the semester, Jan 17th, and closes on **Sunday, Jan 29th at 11:59pm**. Every other unit begins on a **Friday at 12.01 a.m.** and ends on the **Sunday either 9 days or 16 days later at 11.59 p.m. (midnight)** depending on whether we need 1 or 2 weeks to cover the material. For example, unit 2 begins on **Friday, Jan 27th at 12:01am** and ends on **Sunday, Feb 5th at 11:59pm**. All of the unit's materials and assignments become available only when the unit starts. There will be 14 units in total.

During each unit, the following tasks must be completed.

- (1) Complete the **reading assignments**. These will come from the course textbook or online articles and material available in Document Sharing or the Webliography in LearningStudio (eCollege), located on the top menu bar. The reading material for each unit will be announced with the unit's material each **Friday at 12.01 a.m.**
- (2) Watch the unit's **1-5 Mini-lectures** which will cover one or two key concepts at a time, to reinforce reading material, or give examples of problem solving. Mini-lectures for each unit will be available with the unit's material each **Friday at 12.01 a.m.** Sometimes I will post mini-lectures covering concepts according to student demand.
- (3) Complete the **quizzes** designed to assess students' comprehension of the reading assignments, mini-lectures and basic knowledge of key principles. Quizzes for a unit's material will be available with the unit's material each **Friday at 12.01 a.m.** and must be completed by **11.59 p.m. the Sunday 9 days later**.
- (4) Participate in the **discussion threads**. Each unit you must make at least 3 substantial posts in each of the current unit's threads, and 2 responses to posts in the *previous* unit's threads. A unit's discussion thread opens at **12.01 a.m. Fridays** and remains open throughout the semester.
- (5) Complete the **homework**. New homework questions will become available with the unit's material at **12.01 a.m. Fridays**. **Important:** New homework questions are set each unit, but they will be due roughly every 3 weeks in **Dropbox**, although it is

encouraged that you submit the homeworks when you complete them. (See the course calendar at the end of this syllabus).

In addition, 2 projects will be assigned at various stages during the semester. You will have around 5 weeks to complete each one.

*A complete list of due dates **for discussion posts, quizzes and homeworks are given on pp. 23, 24 and 25 of this syllabus.***

Learning Activities and Assessments

The following describes the assignments you must complete which will contribute to your progress through the course and to your final grade, together with how they will be assessed.

- **Quizzes** are designed to assess students' comprehension of the reading assignments, mini-lectures and basic knowledge of key principles, often in response to the mini-lectures and reading assignments.

Quizzes are designed to provide you with initial assessment of your learning and *will not be graded based on whether you got the answer correct, but that you have attempted an answer thoughtfully.* A small amount of extra-credit will be available for correct responses, however.

You will only be able to take quizzes once. Once you begin taking the quiz, you will have a time limit of one hour to complete it. Once completed, you cannot return to it and revise your answers. You will see your score, however, and what answers you got wrong.

The quizzes will be found underneath each unit's tab on the left side of the LearningStudio window.

Quizzes address: Learning Outcomes 1-4

- **Ongoing Discussions** will be conducted each unit on the concepts introduced in the reading material and lectures. A number of threads will be opened, one per topic. Sometimes I will ask a question or pose a problem to get you started.

Learning and understanding is significantly enhanced by active engagement in the class through continual discussion of topics. All students are required to participate in the discussions with a number of substantive posts. **Students are required to make 3 substantive posts, in three separate threads, giving your thoughts about**

the reading or answering the opening questions. In addition, students are required to make two posts in the *previous* unit's threads, replying to posts of other students or of myself. That makes a total of 5 posts per unit that will be graded.

The rubric for grading the online discussions is found on pp.20-21 of the course syllabus.

Of course, continued discussion beyond the minimum posts required is strongly encouraged. I will pitch into the discussion at various times during the unit, answering queries and asking new questions to make sure we discuss all the unit's material adequately.

The discussion forums are where you should ask for *help as soon as you need it*. Be specific about the questions you ask. I will prepare supplementary lectures going over examples and explanations in response to certain questions that come up, but to do that you need ask questions as soon as they come up.

When appropriate, at least one thread will be devoted to discussing how one might teach the unit's concepts at the high school or undergraduate level, and for the sharing of your own experiences and resources for the benefit of the teaching community.

I hope to make the discussion threads a fun and lively forum throughout the semester!

The discussion threads will be found underneath each unit's tab on the left side of the LearningStudio window.

Discussions address: Learning Outcomes 1-6

Each unit, a **Homework** will be set. These will generally come in five forms: questions requiring a more substantive analysis of the unit's reading, problem solving questions, an online laboratory, a reflection on how the material would be presented in the high school classroom, or more discussion posts. Full instructions will be provided each unit, together with the method of assessment, in the unit's content area.

Homework questions will be collected in for grading at 4 different dates during the semester (roughly every 3 weeks). Homework can be delivered to to DropBox (under the DropBox tab on the top toolbar) at any time, up to the due date. Each unit's homework questions will have their own DropBox folder.

Virtual labs as part of some homeworks will often be conducted using the open educational resource PhET simulations.

Homework that involves problem solving, pictures, or other material that is difficult to submit as a Word format or similar, may be submitted as hand written work scanned in or photographed. If you use a camera phone to take pictures of your work, a useful app is CamScanner (<https://www.camscanner.com>), which compiles multiple pictures into one document for ease of uploading. There is a free version that I encourage you to check out. Make sure that your work is legible in scanned form.

Homeworks address: Learning Outcomes 1-6

- **2 Projects** will be assigned throughout the semester, one after about 5 weeks and one after about 10 weeks. Each one will be due by the date I set the next one (giving you about **5 weeks for each one.**) **They must be submitted to DropBox (under the DropBox tab on the top toolbar).** I will give more details and instructions closer to when they are assigned.

Projects address: Learning Outcomes 1-6

GRADING

Full completion of quizzes – roughly (2/3)% each unit	10%
Performance on Quizzes – roughly 1% each unit	14%
Discussion – roughly 2% each unit	28%
Homework – roughly 2% each unit	28%
Project 1	10%
Project 2	10%
Extra Credit (TBD)	3%

Current scores will be available for students to see in the Gradebook on LearningStudio (eCollege).

Grading Scale:

90-100%	A
80-89.99%	B
70-79.99%	C
60-69.99%	D
<59.99%	F

TECHNOLOGY REQUIREMENTS

- To fully participate in online courses, you will need to use a current, Flash enabled browser. For PC users, the suggested browser is Internet Explorer 9.0 or 10. For Mac users, the most current update of Firefox is suggested.
- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
 - 512 MB of RAM, 1 GB or more preferred
 - Broadband connection required courses are heavily video intensive
 - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution
- You must have a:
 - sound card, which is usually integrated into your desktop or laptop computer
 - speakers or headphones.
- Depending on your course, you might also need a:
 - webcam
 - microphone

For courses where interactive tools are used, like VoiceThread or Class Live Pro, headphones are suggested for use with recording and playback. We recommend a webcam with an integrated microphone, such as the Microsoft LifeCam Cinema. All devices should be installed and configured before class begins.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. Java can be downloaded at:
<http://www.java.com/en/download/manual.jsp>
- Current anti-virus software must be installed and kept up to date.
- You will need some additional free software for enhanced web browsing. Ensure that you download the free versions of the following software:
 - Adobe Reader

- Adobe Flash Player
- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.
- For additional information about system requirements, please see: <https://secure.ecollege.com/tamuc/index.learn?action=technical>
- If you use a camera phone to take pictures of your work, a useful app is CamScanner (<https://www.camscanner.com>), which compiles multiple pictures into one document for ease of uploading. There is a free version that I encourage you to check out.

ACCESS AND NAVIGATION

Pearson LearningStudio Access and Log in Information

Note: eCollege has recently changed its name to LearningStudio.

This course will be facilitated using Pearson LearningStudio, the learning management system used by Texas A&M University Commerce. To get started with the course, go to: <http://www.tamuc.edu/myleo.aspx>.

You will need your CWID and password to log in to the course. If you do not know your CWID or have forgotten your password, contact Technology Services at 903.468.6000 or helpdesk@tamuc.edu.

It is strongly recommended that you perform a "Browser Test" prior to the start of your course. To launch a browser test, login to Pearson LearningStudio, click on the 'myCourses' tab, and then select the "Browser Test" link under Support Services.

Pearson LearningStudio Student Technical Support

Texas A&M University Commerce provides students technical support in the use of Pearson LearningStudio.

Technical assistance is available 24 hours a day/ 7 days a week.

If at any time you experience technical problems (e.g., you can't log in to the course, you can't see certain material, etc.) please contact the Pearson LearningStudio Help Desk, available 24 hours a day, seven days a week.

The student help desk may be reached by the following means 24 hours a day, seven days a week.

- **Chat Support:** Click on *'Live Support'* on the tool bar within your course to chat with an Pearson LearningStudio Representative.
- **Phone:** 1-866-656-5511 (Toll Free) to speak with Pearson LearningStudio Technical Support Representative.
- **Email:** helpdesk@online.tamuc.org to initiate a support request with Pearson LearningStudio Technical Support Representative.

Accessing Help from within Your Course: Click on the *'Tech Support'* icon on the upper left side of the screen inside the course. You will then be able to get assistance via online chat, email or by phone by calling the Help Desk number noted below.

Note: Personal computer problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, an Internet cafe, or a bookstore, such as Barnes & Noble, etc.

Policy for Reporting Problems with Pearson LearningStudio

Should students encounter Pearson LearningStudio based problems while submitting assignments/discussions/comments/exams, the following procedure **MUST** be followed:

1. Students must report the problem to the help desk. You may reach the helpdesk at
2. helpdesk@online.tamuc.org or 1-866-656-5511

3. Students **MUST** file their problem with the helpdesk and obtain a helpdesk ticket number
4. Once a helpdesk ticket number is in your possession, students should email me to advise me of the problem and to provide me with the helpdesk ticket number
5. At that time, I will call the helpdesk to confirm your problem and follow up with you

PLEASE NOTE: Your personal computer/access problems are not a legitimate excuse for filing a ticket with the Pearson help desk. You are strongly encouraged to check for compatibility of your browser **BEFORE** the course begins and to take the Pearson LearningStudio tutorial offered for students who may require some extra assistance in navigating the Pearson LearningStudio platform. **ONLY** Pearson LearningStudio based problems are legitimate.

Internet Access

An Internet connection is necessary to participate in discussions and assignments, access readings, transfer course work, and receive feedback from your professor. View the requirements as outlined in Technology Requirements above for more information.

myLeo Support

Your myLeo email address is required to send and receive all student correspondence. Please email helpdesk@tamuc.edu or call us at 903-468-6000 with any questions about setting up your myLeo email account. You may also access information at <https://leo.tamuc.edu>.

Learner Support

Go to the following link [One Stop Shop](#)- created to serve you by attempting to provide as many resources as possible in one location.

Go to the following link [Academic Success Center](#)- focused on providing academic resources to help you achieve academic success.

COMMUNICATION AND SUPPORT

The following is the list of communication methods used in this class and their purposes. These include student-instructor, instructor-student and student-student communication.

You will be expected to check your university email account and log onto eCollege at least once every 24 hours Monday-Friday in order to keep abreast of the latest class announcements.

- **Email** will be used by me to communicate to the class as a whole general information about upcoming assignments, due dates, and any changes in the schedule or syllabus that might occur.

I will also email students individually with occasional feedback from assignments and on the class as a whole.

Students can use email to ask me any questions about (i) course logistics (upcoming assignments, due dates...) (ii) as any questions about the way their specific assignments were graded and feedback they have been given (iii) constructive feedback to me about how the course is going and any problems/concerns with the course structure (and even things that work particularly well!)

In emails, please put "PHYS561 Online" in the subject header. I will reply to emails within 24 hours (48 at weekends and holidays)

I will always send emails to your official University Email address as given through MyLeo. It will be your responsibility to check your university email regularly.

- **Announcements** on LearningStudio (eCollege) will be used to communicate to the class as a whole general information about upcoming assignments, due dates, and any changes in the schedule or syllabus that might occur. New announcements will appear to you the next time you log in to LearningStudio (eCollege).
- **Discussion threads** for each unit should be the main way in which you ask and debate the answer to questions you have about the course material itself. Here you can brainstorm problem solving techniques and analyses of reading material. These questions should be continually addressed by your fellow students, and by myself, although in the spirit of discussion concrete answers will only be given after an honest and sustained attempt to figure out the answers yourselves.
- **Virtual Office** is another place to discuss questions you have about the course individually with me. As well as questions about course logistics, **if anything about the material is unclear to you and preventing you tackling the concepts in the discussion**, this is the place to ask those questions. Any questions that could be answered in the discussion thread, I will only answer here after an honest and sustained discussion on them in the thread. Like emails, I

will reply to Virtual Office questions within 24 hours (48 at weekends) unless they are asked during virtual office hours, in which case I'll answer them during those hours.

- **Adobe Connect** will be available if you wish to ask questions face to face during office hours. It is essentially a more sophisticated version of Skype, and can support conversations between multiple people. It works through a web browser; I will email a link ahead of each office hours.

Online Office Hours will be held each Tuesday and Thursday from 6:00 p.m.-7:00 p.m. I will be active during those times on the discussion threads, **Adobe Connect** and **Virtual Office**.

- **Student Lounge** is located on the left hand menu under Course Home, and is a place to chat with fellow students about anything you like – as trivial or as deep as you like. This is a place I will NEVER visit, intended for yourselves only.

The following table summarizes where to find the communication tools used in this class:

Communication tool	Where to find
Email	Top toolbar or Leomail
Virtual Office	Left menu under "Course Home"
Discussion thread	Left menu under the relevant Unit tab.
Student Lounge	Left menu under "Course Home"
Announcements	New announcements appear when you log on to LearningStudio

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures

Academic Honesty

Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including (but not limited to) receiving a failing grade on the assignment, the possibility of failure in the course and dismissal from the University. Since dishonesty harms the individual, all students, and the

integrity of the University, policies on scholastic dishonesty will be strictly enforced. In **ALL** instances, incidents of academic dishonesty will be reported to the Department Head. Please be aware academic dishonesty includes (but is not limited to) cheating, plagiarism, and collusion.

Cheating is defined as:

- Copying another's test or assignment.
- Communication with another during an exam or assignment (i.e. written, oral or otherwise).
- Giving or seeking aid from another when not permitted by the instructor.
- Possessing or using unauthorized materials during the test.
- Buying, using, stealing, transporting, or soliciting a test, draft of a test, or answer key.

Plagiarism is defined as:

- Using someone else's work in your assignment without appropriate acknowledgement.
- Making slight variations in the language and then failing to give credit to the source.

Collusion is defined as:

- Collaborating with another, without authorization, when preparing an assignment.

If you have any questions regarding academic dishonesty, ask. Otherwise, I will assume that you have full knowledge of the academic dishonesty policy and agree to the conditions as set forth in this syllabus. **Homework and discussion posts will be randomly tested for plagiarism.**

Attendance Policy

In an online class, attendance means active participation; students are expected to spend at least 2 hours/week on the discussion threads and at least 10 hours/week is required to complete all the assignments, including reading. At least five substantive discussion posts are required by each student each unit to gain full points on the discussion part of the grade. If you are unable to log on for an extended period of time (greater than a week) then contact me *in advance* to discuss how to proceed. We recognize that many of you already have a busy work schedule, and that occasionally you might get behind in a unit. Spending even 15-30 minutes a day on class material and the discussion threads will help greatly, ***and if you find yourself struggling at any time, please do not hesitate emailing me; I can be flexible to accommodate your busy schedule.***

Assignment policy

Students will be responsible for knowing when due dates for homeworks, quizzes and projects are by reading the syllabus, looking at the schedules under "Course Home" and in this syllabus, and reading the relevant sections when posted on eCollege. If the schedule changes, you will receive an email and an announcement on eCollege about it.

Late work

Late homeworks will be penalized by 10% by each day they are late (i.e. a Homework submitted more than 10 days late gets no credit). Late projects (except the last one, which is due by the last day of classes) will be penalized by 10% by each day they are late. Quizzes and discussion posts will not be accepted past the due date.

Netiquette: Communication Courtesy Code

Students are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. The same rules apply online as they do in person. Be respectful of other students. Foul discourse will not be tolerated. Please take a moment and read the following links concerning "netiquette". <http://www.albion.com/netiquette/>
<http://www2.nau.edu/d-elearn/support/tutorials/discrubrics/netiquette.php>

UNIVERSITY SPECIFIC PROCEDURES

Discrimination statement

A&M-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

ADA Statement: Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 132

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

StudentDisabilityServices@tamuc.edu

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See *Code of Student Conduct from Student Guide Handbook*).

Harassment Policy

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources here:

University Title IX Contact: Michele Vieira, 903-886-5025,
<mailto:TitleIX@tamuc.edu>

University resource webpages:

<http://www.tamuc.edu/facultyStaffServices/humanResources/title-ix/resources.aspx>

<http://www.tamuc.edu/campuslife/campusServices/universityPoliceDepartment/crimePrevention/sexualAssault.aspx>

University Counseling Center: 903-886-5145,

<http://www.tamuc.edu/campusLife/campusServices/counselingCenter/default.aspx>

Campus police: <mailto:upd@tamuc.edu>, call 911 in emergency situations

External resources:

Crisis center of NorthEast Texas: <http://www.ccnetx.org>

Know you IX: <http://knowyourix.org>

End rape on campus: <http://endrapeoncampus.org>

Clery Center for Security on Campus: <http://clerycenter.org>

Not Alone: <https://www.notalone.gov>

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorize

the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

and/or consult your event organizer). Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

ONLINE DISCUSSION RUBRIC

Your discussion posts will be graded using the following rubric. Each unit's discussion posts contribute up to 2% to your final grade.

Note: One post counts as 100 words or more on topic. Posts with less words or posts not addressing the unit's class topic will not be considered for grading. Of course, the discussion should be allowed to flow naturally, and shorter posts will naturally occur, including one word posts of the type "I agree!" and "Yes!" or "No!". This is fine, and indeed necessary – it is just that the grading will be based upon posts of 100 words or more.

A reminder that netiquette should be observed at all times: please make sure you visit and understand the following resources:

<http://www.albion.com/netiquette/>

<http://www2.nau.edu/d-elearn/support/tutorials/discrubrics/netiquette.php>

Criteria	Unacceptable(0)	Poor (1)	Good (2)	Excellent (3)
Number of posts	No posts during the unit.	1-2 posts during the unit.	3-4 posts during the unit.	5 or more posts during the unit.
Spelling and Grammar	Posts are not in complete sentences, or more than half of the sentences have spelling or grammatical errors.	Between a quarter and half of sentences have spelling or grammatical errors.	Less than a quarter of sentences have spelling or grammatical errors.	No spelling or grammatical errors.
Knowledge	Posts demonstrate no evidence of knowledge of the unit's reading.	Posts demonstrate evidence of only a cursory reading of the unit's material, and little attempt to critically analyze it.	Posts demonstrate reasonable knowledge of the unit's reading, and an attempt to critically analyze it.	Posts demonstrate evidence of comprehensive knowledge of the unit's reading, and significant attempts to critically analyze it.

Appropriateness and awareness of other student contributions	Posts rude/disrespectful. No attempt to build upon other students' posts or support other people's arguments.	Minimal acknowledgment of other students' posts. Little attempt to build upon arguments.	Reasonable attempts to build upon other students' posts and contribute to their arguments.	Excellent awareness of other students' posts and substantial efforts to contribute to their arguments.
References and support	Arguments are unsupported, come across as unsubstantiated opinion.	Minimal support for students' arguments. Student's thinking unclear, hard to discern how student arrived at their conclusions.	Reasonable attempt to justify arguments made, with some references to the unit's reading and external sources where appropriate.	Arguments are fully backed up, with clear explanations of how the student arrived at their conclusions, with full references to the unit's reading or to external sources where appropriate.

Credit: The following online rubrics have been used to inform the development of the rubric above:

<http://www.udel.edu/janet/MARC2006/rubric.html>

<http://www2.nau.edu/d-elearn/support/tutorials/discrubrics/discrubric.php>

https://topr.online.ucf.edu/images/f/f0/IDL6543_Discussion_Rubric.pdf

COURSE OUTLINE / CALENDAR

This schedule is tentative.

Unit	Date unit opens	Topic	Chapter/Sections
1	Jan 17	Scales of the universe Orbits (Kepler's laws, mass), Parallax (distance), Magnitudes (brightness)	2.5, 3.1.3, 13.1, 13.2, 13.5
2	Jan 27	Color index, temperature of stars, blackbody radiation	5.7, 13.3
3	Feb 3	Emission/absorption spectra; detecting light in telescopes	5.1, 5.2, 5.3, 6
4	Feb 10	Spectral classes, luminosity classes, spectroscopic parallax, the HR diagram	14.2, 14.3, 14.4
5	Feb 17	Hydrostatic equilibrium, mass conservation, the equations of stellar structure	14.1, 15.1 (up to beg. of 15.1.1)
6	Feb 24	The Virial theorem, stellar timescales, the source of energy in stars; pp chains, equation of energy generation Energy transport (radiative, convective), timescales	15.1.1-15.4
7	Mar 3	Testing stellar models: measuring mass, radius, the main sequence, the distances to clusters, ages of clusters (MS turn-off)	13, 5.3, 14.1
8	Mar 10	Interstellar medium, stellar birth, evolution of Sun-like stars, Massive star evolution, stellar remnants	16.1, 16.2, 17.1, 17.2, 17.3, 18
9	Mar 24	Relativity	-
10	Mar 31	Neutron stars and Black Holes	18
11	Apr 7	Radiative processes	10.2.1
12	Apr 14	Galaxies, AGNs	20, 21
13	Apr 21	Clusters, Cosmology I	22
14	Apr 28	Cosmology II	23, 24

COURSE DUE DATES: DISCUSSION POSTS

In each unit you must post at least **one** post in each of **three different** discussion threads, giving your initial thoughts on the subject of the thread or any conceptual or mathematical difficulties you are having with the thread subject. You must also post at least **two** follow up posts in your choice of the **previous unit's** threads, responding to another person's comments, or one of my comments. That makes a total of **five** posts per unit that will be graded.

Discussion threads for a particular unit open at **12.01 a.m.** each **Friday** with the rest of the unit's material. To receive credit for your posts, they must be made within the time-frame outlined below. The threads remain open until the end of the semester.

UNIT	DISCUSSION THREADS OPEN	3 POSTS IN 3 DIFFERENT THREADS DUE	2 FOLLOW-UP POSTS DUE
1	Jan 17	Jan 29	Feb 5
2	Jan 27	Feb 5	Feb 12
3	Feb 3	Feb 12	Feb 19
4	Feb 10	Feb 19	Feb 26
5	Feb 17	Feb 26	Mar 5
6	Feb 24	Mar 5	Mar 12
7	Mar 3	Mar 12	Mar 26
8	Mar 10	Mar 26	Apr 2
9	Mar 24	Apr 2	Apr 9
10	Mar 31	Apr 9	Apr 16
11	Apr 7	Apr 16	Apr 23
12	Apr 14	Apr 23	Apr 30
13	Apr 21	Apr 30	May 7
14	Apr 28	May 7	May 14

COURSE DUE DATES: QUIZZES

The **pre-course assessment** and **syllabus quiz** becomes available on **Tuesday Jan 17th** at **12.01 a.m.** *For the syllabus quiz only, you may take the quiz as many times as you like. You will only gain access to unit one once you have made 100% on the syllabus quiz and have completed the pre-course assessment.*

Quizzes on each unit's reading material become available at **12.01 a.m.** each **Friday** along with the rest of the unit's material, and close at **11.59 p.m. (midnight)** the following **Sunday**, (usually) **9 days later**.

NOTE: *Apart from the syllabus quiz, quizzes can only be attempted once. Once you begin taking the quiz, you will have a time limit of one hour to complete it. Once completed, you cannot return to it and revise your answers.*

UNIT	QUIZ AVAILABLE	QUIZ DUE
1	Jan 17	Jan 29
2	Jan 27	Feb 5
3	Feb 3	Feb 12
4	Feb 10	Feb 19
5	Feb 17	Feb 26
6	Feb 24	Mar 5
7	Mar 3	Mar 12
8	Mar 10	Mar 26
9	Mar 24	Apr 2
10	Mar 31	Apr 9
11	Apr 7	Apr 16
12	Apr 14	Apr 23
13	Apr 21	Apr 30
14	Apr 28	May 7

COURSE DUE DATES: HOMEWORKS

Homework becomes available with each unit, on **Friday** at **12.01 a.m.** They are due at **11:59pm** on the due dates shown in the calendar below.

UNIT	HW AVAILABLE	HW DUE
1	Jan 17	Feb 12
2	Jan 27	
3	Feb 3	
4	Feb 10	Mar 5
5	Feb 17	
6	Feb 24	
7	Mar 3	Mar 26
8	Mar 10	
9	Mar 24	
10	Mar 31	Apr 16
11	Apr 7	
12	Apr 14	May 7
13	Apr 21	
14	Apr 28	