

ASTR 108 – Introduction to Astronomy

Session 09/52

Online Course Syllabus

(R0 - August 28, 2009)

IMPORTANT: This document contains information that is critical to success in this course. Since this course may have different rules than courses you have taken in the past, it is extremely important to your success in the course that you read it in its entirety before you begin the class.

Course Description

A survey of the evolution of Astronomy, the solar system, the structure and properties of different planets and galaxies, and the instruments used for astronomical observation.

Prerequisites

Math 106 or above (Intermediate Algebra)

I. Overview and Course Goals

Welcome to *Introduction to Astronomy* online. This course is designed to provide the student with a broad overview of the science of astronomy. This is a conceptual course which means it will focus on the important top level concepts of astronomy and not delve into the deeper physics and mathematics behind the broader concepts.

The course will cover our present understanding of the solar system and its formation, stars and their formation, our galaxy, and the known universe. Also covered will be the methods, tools, and instruments by which scientists have expanded our knowledge from the early beginnings up to present day. Each week the student will be given a reading assignment, two discussion topics, and a homework assignment related to the readings. There will be five short quizzes, a mid-term exam, and a final exam. Topics covered during each week are as indicated below.

Week 1: We will begin with some basics, such as the motions of the Moon, Sun and stars in the sky, why the Earth experiences seasonal changes and the cause of the Moon's phases and eclipses. We will also study the historical basis of modern astronomy and those who laid the foundation.

Week 2: The nature of light, other forms of electromagnetic radiation, and how they are used in astronomy will be discussed. Instruments used by astronomers, such as visual telescopes, radio telescopes, and spectrometers, will be examined. We then look at the processes involved in the formation of our solar system.

Week 3: An examination of Earth, the Moon, and the other terrestrial planets in our solar system will be made.

Week 4: The giant Jovian planets and other objects, such as asteroids and comets, which reside in the outer solar system, will be discussed.

Week 5: We examine our Sun in more depth. We look at the forces that led to the Sun's creation and compare them to other stars that exist elsewhere in the universe. We will also examine the birth up through mid-life of stars and the methods used to bring some organization and structure to the massive numbers of stars.

Week 6: All stars eventually die, but when, and how, and what is the impact on the universe? We will search for answers to these questions this week along with a look at one of the more bizarre space objects, the black hole.

Week 7: The galaxies are our next destination. We will look at our galaxy, the Milky Way, as well as many others. Here we will come to appreciate the enormous scale of the universe.

Week 8: Finally, we will look at the most profound topics of all, the birth of the universe, its ultimate fate, and the possibilities of intelligent life beyond our small blue planet.

II. Course Objectives

Upon completion of this course the student should be able to:

- Demonstrate a knowledge of objects in the universe and their properties
- Demonstrate knowledge of instrumentation and methods used by astronomers.
- Demonstrate knowledge of scientific theories on the origin of the universe.

Topics covered by the course include those listed below.

- Time and space.
- General discussion about the composition of the universe.
- Discussion about different branches of astronomy.
- Solar system— overview.
- Different planets and their satellites.
- Asteroids, comets and meteors.
- The Sun.
- The stars— detailed discussions.
- Galaxies.
- Origin and structure of the universe.

Measurable Outcomes are as follows:

- Describe the celestial sphere and the coordinate system used to specify locations on it.
- Outline how the geocentric model of the Universe was supplanted by the heliocentric model.
- Differentiate between sidereal and solar time.
- Describe parallax and how they are used to determine distances to celestial objects.
- State and apply Kepler's laws of planetary motion.
- Interrelate the frequency, wavelength, and energy of light.
- Describe the electromagnetic spectrum
- Define temperature and interconvert between temperature scales.
- Explain Wein's law and emission and absorption spectra.
- Use the Doppler Effect to calculate the speed of celestial objects, relative to Earth.
- Explain the functioning of optical and radio telescopes, and compare their capabilities.
- Outline current theories of solar system formation; describe terrestrial and Jovian planets, asteroids, and comets.
- Describe current methods for detecting extra solar planets.
- Describe the properties of the Moon, its phases, and its tidal effects on the Earth.
- Explain the structure and functioning of the Sun.
- Outline the lifecycles of stars.
- Locate various types of stars on the Hertzsprung-Russell diagram.
- Describe the different classes of galaxies.
- Explain Hubble's law and how it relates to the Big Bang theory of the formation of the Universe.

III. Course Policies

The policies governing the conduct of this course are covered below. It is essential that students be familiar with these policies since *the course will be conducted in accordance with these rules.*

Online Course Methodology

Students new to online education or unfamiliar with the course delivery environment, Desire2Learn (D2L), are strongly urged to review the information contained in the basic student manual for Desire2Learn, available online at <http://www.ccis.edu/online/studentmanual/> . Knowledge of the Desire2Learn features is critical to students' success in online coursework with Columbia College. The features in Desire2Learn implemented by this course include the Content, Classlist, Discussions, Dropbox, Grades, Quizzes, Checklist, and FAQ. Go to <http://www.ccis.edu/online/demo.asp> for a demonstration on taking on-line courses. Help for questions in general may be obtained at: <http://www.cchelpdesk@ccis.edu> .

Discrimination and Disabilities

There will be no discrimination on the basis of sex, race, color, national origin, sexual orientation, religion, ideology, political affiliation, veteran status, age, physical handicap, or marital status. Students with documented disabilities who may need academic services for this course are required to register with the Coordinator for Disability Services. Until the student has been cleared through the disability services office, accommodations do not have to be granted. It is vital if you are a student who has a documented disability to read the entire syllabus before signing up for the course. The structure or the content of the course can make an accommodation not feasible. The policies and related syllabus matters remain subject to change in the event of extenuating circumstances. Students with documented disabilities who may need academic services for this course are required to register with the ADA coordinator of Columbia College at (573) 875-7626.

Student Conduct

The instructor reserves the right to manage a positive learning environment and thus will not tolerate inappropriate conduct in the course. All Columbia College students, whether enrolled in a land-based or online course, are responsible for behaving in a manner consistent with Columbia College's Code of Student Conduct and Ethics Code for Computer Users. Students violating these codes will be referred to the Campus Life Office for possible disciplinary action. The Code for Student Conduct and the Ethics Code for Computer Users can be found in the Columbia College Student Handbook, a copy of which can be obtained by calling the Campus Life office at (573) 875-7425.

Online Participation

This course is offered online using course management technology provided by *Columbia College*. Participation online is expected to be continuous throughout the course. Failure to complete quizzes or exams by scheduled deadlines, or failure to participate in online discussions in a timely manner may result in the student being withdrawn from the course. Emergencies should be communicated and documented to the instructor as soon as possible. Students are expected to read the assigned text each week, log-in to the class discussion, and post at least one message per week to each of the threads provided in the Discussion area. Understand that this is only a minimum requirement for participation in online discussions. For full credit, students must follow the guidelines for online discussions. Active participation in the course will aid students in completing practice assignments and other preparations for quizzes and exams. The instructor will facilitate online discussions in the discussion area by responding to posted messages. See "**Ground Rules for Online Participation**" for additional information.

Daily Internet access is a prerequisite for online coursework. Equipment or software failures are not acceptable reasons for late assignments or discussions. Students should have a backup plan, such as use of a friend's computer, work computer, or public computer access at a local public library, to ensure daily course access. A class week is defined as the period of time between 12:01 AM on a Monday and 11:59 PM the following Sunday, with the exception of Week 8, which ends at 11:59 PM on Sunday. Week 1 of this session begins on **October 19, 2009** and ends at midnight on **Saturday December 12, 2009**. The last day to drop this class without academic or financial liability is October 26, 2009. Discussion postings, homework assignments, quizzes and exams scheduled for completion during a class week should be submitted by the weekly due dates specified in the course assignment and testing schedule included in Section VI of this document. All dates and

times are based upon the Central Time Zone in the United States.

Ground Rules for Online Participation

The following rules will apply at all times during this course.

- Students should use e-mail for private messages to the instructor and other students. Students should use the Dropbox feature of Desire2Learn for turning in quizzes, proctor information, and other graded papers. The Discussions area of the online course is only for public messages. Grades, course content, or personal items must be handled through e-mail.
- Students are expected to participate in online discussions as well as with other appropriate online activities including sending/receiving e-mail and navigating and conducting research over the World Wide Web as required to complete assignments for the course.
- Students should use their Columbia College e-mail address for all class communications outside of D2L. Any important messages to the student regarding course progress or issues will be sent only to this e-mail address. Student is expected to check this e-mail at least twice a week to assure timely communications regarding course issues.
- All students will observe conventions of "online etiquette," when communicating online which includes courtesy and respect to all users at all times. Use of vulgarities or swearing is strictly prohibited both in e-mail communications and in discussion postings. Students should maintain the same standards of civil, respectful speech and behavior towards one another that are expected in the traditional academic environment of the classroom.
- Students may seek assistance with computer related problems through the instructor or through help numbers included in this syllabus. It is the responsibility of the student to have access to a computer system that is compatible with the requirements of this course.
- Homework assignments must be submitted through the course Dropbox feature. Documents submitted must be uploads of the original assignment document and must be in Microsoft WORD format and include both the question and the student's answers. No other form of submittal, such as e-mail, is allowed without prior instructor approval.
- Minor changes to the course content, such as discussion topics, may be required to keep the course current. The syllabus within D2L will reflect the latest revisions.

Academic Honesty

All Columbia College policies are in effect as described in the Academic Dishonesty/Misconduct section of the current college Catalog. All your work must be your own unless collaboration has been authorized. If collaboration is authorized you must acknowledge the collaboration in writing. Your grade will be based in large part on the originality of your ideas and your written presentation of these ideas. Presenting as one's own the words, ideas, or expression of another in any form is cheating through plagiarism. If you are unsure what constitutes plagiarism, review the rules of original writing at the following web site:

<http://owl.english.purdue.edu/> . This link provides valuable information, including examples about plagiarism.

Here are two other sites that may be of interest: <http://www.indiana.edu/~istd> and <http://www.plagiarism.com> .

Plagiarism will not be tolerated and the claim of ignorance is no excuse. ***Those who plagiarize may receive a zero for the assignment and be reported to the proper College administration.*** Collaboration with other students is not permitted without explicit permission from the instructor. This is a form of plagiarism. Roommates or spouses taking the same course should be particularly careful to avoid unauthorized collaboration. Other forms of academic dishonesty, for the purpose of this course, include any joint effort in homework, examinations, quizzes, or reproducing text from any written sources without proper references, and willfully aiding another in any act of academic dishonesty.

In a case of plagiarism or other academic dishonesty, a report of the matter will be filed with the Dean of Student Affairs, and the Dean for Academic Affairs, in fulfillment of college policy with regard to these academic offenses. Information regarding avoidance of plagiarism is available in the Course Policies module in the Content Area.

Levels of Communication

Both formal and informal levels of communication apply to this course. All assignments submitted to a dropbox are to be formal and as such the formal rules of proper English and grammar apply and appropriate references are required. Discussion postings may be less formal. There will be no penalties for spelling, grammatical, and syntactical errors; however, discussions postings must effectively communicate your ideas, must be original, and demonstrate your understanding of the discussion topic. Quotes used in support of your argument are allowed, but your views and opinions are required. Submitting mostly quotes is unacceptable and may result in a reduced grade. When e-mailing the instructor, please begin all communications with the student's full name followed by the course and section number so that the instructor may easily identify the source of the message. E-mail messages not so identified may result in slow or no response at all.

Grading Policy

Assessment standards for each assignment will be given in advance. It is a goal of the instructor to give prompt, clear, and useful feedback to help students. Students will be able to track grade averages exactly throughout the course. The grading scale is based on total points as follows:

A = 895-1,000 B = 795-894 C = 695-794 D = 595-694 F = 0-594

Each student will be accountable for:

- Completion of weekly reading assignments and research on websites topically related to the course.
- Completion of weekly discussion questions in the appropriate discussion thread. There will be fifteen discussion topics in all, two per week for the first seven weeks and one in the eighth week of the course.
- Completion of eight homework assignments as assigned each week.
- Completion of six quizzes, one per week in weeks 1, 2, 3, 5, 6, and 7.
- Completion of a midterm and proctored comprehensive final exam.

The weighted grade value of these various assignments is available in section IV below.

Proctor Policy

Since the final exam is a proctored exam, students must arrange a proctor acceptable to the instructor for this exam and inform the instructor of the choice in accordance with instructions provided within the course (D2L) before the end of the fifth week of the course. ***If a student fails to supply proctoring information before the end of the fifth week of class, that student may be denied the opportunity to take the final exam. If you do not understand the role of a proctor, contact your instructor at once!***

All students must submit a "Proctor Information Form" available in the Content area of D2L. Students living within a one-hour drive of one of the Columbia College Extended Studies campuses are required to use a Columbia College proctor from the local campus. Students utilizing a Columbia College proctor must also schedule a test time with the chosen proctor. Exams are administered on a space available basis, so failure to schedule early may result in students being unable to take the exam. Columbia College proctoring sites are listed at: <http://www.ccis.edu/online/academics/proctor.asp>. If not in close proximity to a Columbia College campus, the student must submit an alternative proctor request to the instructor (see list of acceptable choices below). Proctor approval is at the sole discretion of the instructor. The request for an alternative proctor must include a ***detailed explanation*** for the need to seek an alternative proctor, and include the information required by the "Proctor Information Form". All students must post this form to the appropriate course dropbox by the end of the fifth week of the course. E-Mail submission of proctor information will not be accepted.

Acceptable alternative proctors include Columbia College faculty members, Columbia College Extended Campus directors or their staff members, education officers, chaplains, or commanding officers of military personnel (but not direct superiors), public librarians, faculty of another college or university, staff at a testing center affiliated with another college/university, or an ordained minister of any faith. (If you intend to rely on a testing center staffer employed at another college or university, make sure to check that the staff of that facility is able to proctor for students not enrolled with their school!) . Proctor candidates cannot be friends, employers, supervisors, co-workers, or any other individual that does not fit one of the acceptable proctor categories previously stated.

Late Assignment Policy

The following late assignment policy will be applied without exception.

- **Discussion** postings, both responses and interactions, submitted after the due date will be graded as a zero.
- **Homework** assignments submitted after the due date will have their graded value reduced by 20% for each day or partial day that they are submitted after the due date. As a result, homework assignments submitted more than four days after the due date will receive a grade of zero.
- **Quizzes and exams** must be taken on or before the assigned due date. Barring extraordinary and unavoidable circumstances, makeup quizzes and exams will not be given; allowing makeup exams or quizzes is at the sole discretion of the instructor. Thorough documentation will be required before a makeup quiz or exam will be allowed. As a general rule, arrangements must be made with the instructor prior to the due date of the exam or quiz.
- Due dates may be extended only by the instructor. This will only be done for unavoidable circumstances, such as the D2L webpage being unavailable for an extended period of time, that affect the entire class. Pay close attention to the course homepage for announcements.

IV. Grades

The grade earned in this course will be based upon points earned in five distinct areas. These areas are Discussions, Quizzes, Homework, a Mid-Term Exam, and a comprehensive Final Exam. To earn all possible points, each assignment must be completed by the assignment’s due date. Grades will be posted for each assignment, generally within 24 hours after the due date. Each type of assignment, how many points they are worth, and the total impact to the course grade is presented in the table below.

Assignment Type	Points Each	Number of Assignments	Points	Pct. Final Grade
Discussion Postings	12	15	180	18%
Quizzes	45	6	270	27%
Homework Assignments	25	8	200	20%
Mid-Term Exam	150	1	150	15%
Final Exam	200	1	200	20%
Total			1,000	100%

Discussion Postings

Weekly discussion postings will become available on Monday of each week and must be completed by midnight Wednesday and midnight Sunday respectively of the assigned week (all time are CST). Each discussion is worth a total of twelve points. Eight of these points are earned based on the quality of the scientific argument presented in response to the discussion topic. The remaining 4 points are earned based on the quality of interaction with classmates. These points will be awarded based on the tables below.

Scientific Argument

Grade	Criteria Applied
8	Discussion posting answers questions accurately and completely; argument is well developed and supported by evidence; sources appropriately referenced.
7	All major arguments are presented. Structure of arguments are unsupported or less than desirable resulting in potential misunderstanding of conclusions.
6	Some major arguments are missing or the structure of the argument is inaccurate or incomplete. Grade can be raised by posting a correction of cited deficiencies.
4	Some arguments are presented, but most not presented or inaccurately presented. Grade may be raised by posting a correction to major deficiencies.
2	Argument is wholly inaccurate or doesn't address the topic of the assignment. Grade may be raised by posting a correction to major deficiencies.
0	Failure to post a discussion to the topic by the due date.

Interaction with Classmates

Grade	Criteria Applied
4	Responded to two or more classmates' postings. Interaction was of scientific significance and relative to the topic of discussion.
2	Responded to one classmate posting. Interaction was of scientific significance and relative to the topic of discussion.
1	Responded to classmate postings, but interaction was of little scientific interest relative to discussion topic.
0	Failure to interact with any other student postings by the due date.

The above criterion applies to all discussion topics for the course. If you score less than 8 points on your scientific argument and correct the deficiency noted by responding to your instructor, your scientific argument grade may be raised by one or two points. Only your original scientific argument posting will be used in evaluating your response. When commenting on another student's posting you must include the response of the other student with you posting to receive credit. Topics may be modified during the conduct of the course to keep the class current so respond to the topics as they are stated in D2L.

Quizzes

With the exception of Quiz 1, Quizzes will be made available to students by 12:01 A.M. CDT/CST on Thursday of the week in which they are to be completed. Quizzes are accessed by clicking "Quizzes" on the D2L course home page. They must be completed/submitted by midnight CDT/CST on the following Sunday. Online quizzes are intended to be closed book/closed notes. To enforce this intention, a strict time limit of 15 minutes will be enforced. It is recommended that you do your reading assignment and your homework prior to starting the quiz. Once you begin the quiz you must finish it. Should you lose your communication link you must log back on immediately and still finish the quiz within the allotted 15 minutes. If you have done your readings and homework you should have no trouble completing 9 multiple choice questions within the time limit even if you must log back on. The intent is that you will not have time to look up answers.

Quiz 1, over the course rules presented in the syllabus and "Welcome Letter", has a much longer time period and allows one re-try. This is done so the student will better understand the course rules and policies.

It is important to note that late quiz submissions receive no credit so students must be sure to submit quizzes by the time limit set in D2L.

Homework Assignments

Homework assignments are based on topics discussed in the textbook assigned readings and may require some additional research. One assignment of 5 or 6 short answer questions will be made each week. Assignments will be available on Mondays and are due on Saturday of the same week.

Assignments are Microsoft WORD documents that are to be downloaded to the student's computer, the answers entered into the document by the student, and the resulting completed documented posted to the D2L Dropbox for that week. **E-mailed homework will not be accepted.** More information regarding homework assignments is available in the FAQ document found in the Content area of the course.

Mid-Term and Final Exams

A mid-term exam is given in week 4 of the course. A comprehensive final exam must be taken during the last week of the course. The exams will become available at 12:01 AM on Wednesday of the associated week and must be completed by midnight Saturday of that same week. Both the midterm and final exams are administered online in D2L. An approved proctor's presence and supervision is required for the final exam. The final exam is password protected and is available only to your approved proctor. Exams are closed book/closed notes. Students will be given one hour to complete the mid-term exam and one and one-half hours to complete the final exam. Each exam is predominately multiple choice or true/false with a few short answer questions. More information regarding exams is available in the above mentioned FAQ document. Section III of this document describes your obligation concerning proctor selection, notification, and scheduling.

V. Required Textbook

This course will assign readings each week from the textbook listed below. Both a hardcopy and an online textbook (e-Book) are available. Whichever you are more comfortable with using is acceptable; however, the e-Book provides direct access to animations and links that may greatly facilitate your understanding of the concepts discussed. In addition, they are embedded directly in the text for convenience. A glossary is also provided in the e-Book with hot spot links to further aid in your understanding. The textbook is required beginning with the first day of class. You will have an assignment due on Saturday of the first week that will require the textbook to complete so make sure you have access to the textbook prior to the start of the course. The textbook for the course is:

Book:	“Discovering the Universe”, 8th ed., by Comins and Kaufmann		
Publisher:	W.H. Freeman		
Hardcopy & eBook:	ISBN-13:	978-1-4292-2033-0	
	ISBN-10:	1-4292-2033-3	
E-Book only:	ISBN-13:	978-1-4292-1244-1	(generally less expensive)
	ISBN-10:	1-4292-1244-6	

Textbooks may be ordered online from: <http://bookstore.mbsdirect.net/columbia.htm> . Books may also be ordered by phone at 1-800-325-3252 or by fax 1-800-499-0143. For additional information about the bookstore visit <http://www.mbsbooks.com> .

Note: Be sure to obtain the correct class textbook and edition as listed above. Other books or editions, even by the same authors, do not cover the same material contained in the required text.

VI. Course Schedule

Weekly assignments and activities are listed below. These are the planned activities; however, the instructor reserves the right to make minor changes to individual assignments and activities to keep the course current with changing events in the field of astronomy. The syllabus available within the Content section of the course will always be the latest and most current version of the syllabus.

Weekly Assignments

The table below provides a listing of each week's assignments, the point value, and the due date of each.

Week	Assignment	Point Value	Due Date
1	Discussion 1	12	Wednesday
	Homework 1	25	Saturday
	Discussion 2	12	Sunday
	Quiz 1(Syllabus/Welcome Letter)	45	Sunday
2	Discussion 3	12	Wednesday
	Homework 2	25	Saturday
	Discussion 4	12	Sunday
	Quiz 2 (Chapters 1 – 5)	45	Sunday
3	Discussion 5	12	Wednesday
	Homework 3	25	Saturday
	Discussion 6	12	Sunday
	Quiz 3 (Chapters 6 & 7)	45	Sunday
4	Discussion 7	12	Wednesday
	Midterm Exam (Chapters 1 – 9)	150	Saturday
	Homework 4	25	Saturday
	Discussion 8	12	Sunday
5	Discussion 9	12	Wednesday
	Homework 5	25	Saturday
	Discussion 10	12	Sunday
	Quiz 4 (Chapters 10 – 12)	45	Sunday
6	Discussion 11	12	Wednesday
	Homework 6	25	Saturday
	Discussion 12	12	Sunday
	Quiz 5 (Chapters 13 & 14)	45	Sunday
7	Discussion 13	12	Wednesday
	Homework 7	25	Saturday
	Discussion 14	12	Sunday
	Quiz 6 (Chapters 15 – 17)	45	Sunday
8	Online Discussion 15	12	Wednesday
	Homework Assignment #8	25	Saturday
	Final Exam (Chapters 1 – 19)	200	Saturday
Total		1,000 points	

Weekly Activities

The activities that will be addressed each week are presented below. All due dates are based on Central Standard or Central Daylight Time as appropriate. Should the activities listed below conflict with those contained in the course, the activities within the course will prevail in all cases.

Week 1: Discovering the Night Sky; Gravitation and the Motion of the Planets

Reading Assignment

- Chapters 1 & 2 from the textbook

Discussion 1

- Postings and responses due Wednesday of this week. No late credit!
- Introduce yourself to your classmates. Please give more than your name. Include your profession, hobbies, interest in astronomy, and any other information that can help us get to know you.

Discussion 2

- All postings are due Sunday of this week. No late credit!
- Galileo was the first scientist to use the telescope to study the nighttime sky. Among his discoveries were the phases of Venus and the four major satellites of Jupiter. Discuss the significance of these discoveries and their impact on astronomical theories of that time. Given the views he put forward, do you believe he was treated fairly by society?

Homework Assignment 1

- Assigned in D2L based on topics discussed in Ch. 1 and 2. Due by midnight on Saturday.

Other Class Activities

- Visit the websites:
 - <http://www-gap.dcs.st-and.ac.uk/~history/Mathematicians/Kepler.html> Contains links to biographies of Brahe, Copernicus, and Galileo
 - <http://www.kepler.arc.nasa.gov/johannes.html> Two short but excellent biographies of the life, trials and achievements of this remarkable theoretical astronomer are provided. Also navigate to the website:
 - <http://antwrp.gsfc.nasa.gov/apod/astropix.html>, for the Astronomy Picture of the Day. This webpage is updated daily with some of the newest and most significant astronomical images to be found on the World Wide Web, supplemented with descriptions by professional astronomers and abundant links to topically related web pages. The website also boasts a searchable archive containing entries spanning a number of years.

Quiz 1

- Covers information available in the syllabus and “Welcome Letter”! Special time limit for this quiz only!

Week 2: Light & Telescopes, Electromagnetic Radiation & Spectra, and Formation of the Solar System

Reading Assignment

- Chapters 3, 4, & 5 from the textbook

Discussion 3

- All postings by due Wednesday of this week. No late credit!
- Our solar system was created from a cloud of dust and gas called the solar nebula. Describe the processes that took place in this theory of creation and specifically how it came to be that we have a star and planets rotating around that star and the orbital motion is all in the same plane and the same direction. What is your view of this theory and the rationale for your view?

Discussion 4

- Due Sunday of this week. No late credit!

- The terrestrial and Jovian planets are significantly different in many ways. Two of the more striking differences are size and chemical composition. How does the creation theory presented in the textbook account for these differences and why the theory does or does not seem plausible to you?

Homework Assignment 2

- Assigned in D2L based on topics discussed in Ch. 3/4/5. Due by midnight on Saturday.

Other Class Activities

- See the website <http://www.seds.org/billa/bigeyes.html> to obtain information on the world's largest telescopes and the observatories that house them. Spend some time exploring various links to observatory web-pages.
- For a very comprehensive page on orbital telescopes, visit: <http://www.seds.org/~spider/oaos/oaos.html>.

Quiz 2

- Covers Ch. 1–5. Available on Thursday, must be completed by midnight Sunday.

Week 3: The Earth, the Moon, and Other Terrestrial Planets

Reading Assignment

- Chapters 6 & 7 from the textbook

Discussion 5

- Due Wednesday of this week. No late credit!
- We have been reflecting laser beams off the Moon using reflectors left there by Apollo astronauts. This has resulted in the conclusion that the Moon is moving away from the Earth at a rate of 3.8 cm per year. Discuss specifically what is causing this, the likely end result for the Earth/Moon system, and what you think the impact to humanity might be.

Discussion 6

- Due Sunday of this week. No late credit!
- Several planets in our solar system have a magnetosphere. Describe what is required, in general, for a magnetosphere to exist (not an answer specific only to Earth). Also comment on what you see as the impact to Earth if we should lose our magnetosphere.

Homework Assignment #3

Assigned in D2L based on topics discussed in Ch. 6 and 7. Due by midnight on Saturday.

Other Class Activities

- To get the latest news and information on NASA's current and future unmanned missions to the solar system, visit: http://www.jpl.nasa.gov/solar_system/index.cfm. This webpage is run by the Jet Propulsion Laboratory (JPL) in Pasadena, Ca, which is the mission control center for unmanned missions by NASA.
- Also, see the Solar System Simulator on this website (under the Virtual Orbits section) to simulate the appearance of any solar system body as seen from any other solar system body, for any date and time you choose.

Quiz 3

- Covers Ch. 6–7. Available on Thursday, must be completed by midnight Sunday.

Week 4: The Outer Planets and other Solar System Objects

Reading Assignment

- Chapters 8 & 9 from the textbook

Discussion 7

- Due Wednesday of this week
- There has been a scientific debate raging for many years over Pluto's classification. Pluto lost its status as a planet. What do you think Pluto's classification should be? There is no right or wrong answer, but make sure you provide a scientific rationale for your position.

Discussion 8

- Due Sunday of this week.

- In your own words, discuss why meteors so often appear in "showers" rather than individually. What is happening to cause us to see so many meteors in such a short time? What is the difference between a meteoroid, meteor and a meteorite? Finally, what do you think about the possibility or likelihood we might be clunked on the head during a meteor shower?

Homework Assignment 4

- Assigned in D2L based on topics discussed in Ch. 8 & 9 . Due by midnight on Saturday.

Other Class Activities

- Visit the website <http://nssdc.gsfc.nasa.gov/planetary/planets/asteroidpage.html> to learn more about comets, asteroids and the space missions to study them.

Mid-Term Exam

- Exam over chapters 1-9. Available Wednesday morning, must be completed and submitted by midnight Saturday. Sixty minute time limit is strictly enforced.

Week 5: The Sun, Characterizing Stars, and Stars from Birth through Middle Age

Reading Assignment:

- Chapters 10, 11, & 12 from the textbook

Discussion 9

- Due Wednesday of this week.
- Discuss the energy creation process going on right now in our Sun. Comment on other processes that could be energy sources and why they cannot possibly be the answer.
- **Note:** You may need to supplement your textbook with research on the web to get a complete picture.

Discussion 10

- Due Sunday of this week.
- Stellar parallax is used as a tool to determine distances to stars. Describe how stellar parallax works. Also discuss the limiting factors in its use and the maximum distance that can be accurately measured using this technique. Is this concept unique to astronomy or used in other fields? Provide comments and examples.

Homework Assignment 5

- Assigned in D2L based on topics discussed in Ch 10/11/12. Due by midnight Saturday.

Other Class Activities

- Binary stars are crucial to our understanding of stellar masses, which govern much of the course material for this week. Interactive and animated simulations of binary star systems are available at: <http://csep10.phys.utk.edu/astr162/lect/binaries/visual.html>. Proctor information form must be submitted for approval by end of week 5.

Quiz 4

- Covers Ch. 10–12. Available on Thursday, must be completed by midnight Sunday.

Week 6: The Death of Stars; Black Holes

Reading Assignment:

- Chapters 13 & 14 from the textbook

Discussion 11

- Due Wednesday of this week.
- The larger the mass of a star, the higher the internal pressures. Higher internal pressure causes higher temperatures and it is temperature that determines the types of fusion that can occur deep in a stars interior. Discuss the types of fusion that can occur in a star, the temperatures at which they occur, and the mass (not density) required to produce them.

Discussion 12

- Due Sunday of this week.
- Discuss the causes and major features of Black Holes. Make sure you include the event horizon, its characteristics and what determines its location. Explain why the concept of a Black does or does not

seem reasonable to you.

Homework Assignment 6

- Assigned in D2L based on topics discussed in Ch.13 & 14. Due by midnight on Saturday.

Other Class Activities

- Choose the stellar mass, and then run the simulation to see the star evolve off the main sequence over time. You may also visit: <http://www.rochesterastronomy.org/snimages/> for images and information on the latest supernova discoveries.

Quiz 5

- Covers Ch. 13–14, available Thursday, must be completed by midnight Sunday.

Proctor Information for Final Exam:

- Confirm that your proctor request form has been reviewed and feedback provided regarding acceptance or rejection of your proctor request.

Week 7: The Milky Way, Galaxies; Quasars and other Active Galaxies

Reading Assignment:

- Chapters 15, 16 & 17 from the textbook

Discussion 13

- Due Wednesday of this week.
- "You can't see the forest for the trees" might seem an appropriate analogy for astronomers attempting to determine the shape of the Milky Way galaxy when we are in fact located inside the galaxy. Discuss techniques used by astronomers to determine the type of galaxy we live in and why do you think it is so difficult to determine the shape of our galaxy?

Discussion 14

- Due Sunday of this week.
- Describe at least four techniques used to determine distances to stars and galaxies. Make sure you include the theory behind each method (how they can be used to determine distance) and the range over which valid measurements can be made.

Homework Assignment 7

- Assigned in D2L based on topics discussed in Ch. 15/16/17. Due by midnight Saturday.

Other Class Activities

- Visit the website <http://www.stsci.edu/ftp/science/hdfsouth/hdfs.html> and view the images of the Hubble Deep Field and Hubble Deep Field South. These are two of the deepest surveys of the distant universe done at optical wavelengths. Each image reveals huge numbers of galaxies enormously distant from our own and helps us to understand the location of galaxies.

Quiz 6

- Covers Ch.15–17. Available on Thursday, must be completed by midnight Sunday.

Course Evaluations:

- Course evaluations will available from Monday of this week through Wednesday of week #8. Please take a few minutes to evaluate this course at the following link <http://www.ccis.edu/online/evaluations/evaluations.asp>. Your evaluation is completely anonymous and will not affect your status in this course in any way. With both positive and negative constructive feedback, we will be able to retain the good features and make improvements to others. Your help is greatly appreciated!

Week 8: Cosmology; the Search for Extraterrestrial Life

Reading Assignment

- Chapters 18 & 19 from the textbook

Discussion 15

- Due Wednesday of this week.
- Many astronomers have spent their entire careers trying to definitively answer the question "are we alone?". To date, we have found no other life forms. Discuss the efforts to date and any scientific evidence gathered on this topic. If there is life, where is it likely to be? Aside from the scientific evidence, what are your views regarding life beyond Earth?

Homework Assignment 8

- Assigned in D2L based on topics discussed in Ch.18 & 19. Due by midnight on Saturday.

Other Class Activities

- For details on the recent and monumental discoveries of NASA's cosmologically significant WMAP mission, visit <http://antwarp.gsfc.nasa.gov/apod/ap030217.html>
- And http://map.gsfc.nasa.gov/m_mm.html.

Final Examination:

- This is a proctored exam covering all of the material discussed in the course. It will become available on Wednesday morning and must be completed by Saturday midnight of this week.

VII. Instructor Information

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