



TEXAS TECH UNIVERSITY

College of Arts & Sciences

Department of Physics



ASTR-1400.001 SOLAR SYSTEM ASTRONOMY

(Fall 2015)

WHY THIS COURSE?

Our species needs, and deserves, a citizenry with minds wide awake and a basic understanding of how the world works. -- Carl Sagan

This course will also satisfy a four-hour laboratory science requirement. It is intended for both students who are interested in astronomy and those who are not necessarily "science-oriented" but still need to satisfy a science requirement. Science is more important in our daily lives than ever before - scientific reasoning will play a large role in this course.

LEARNING OBJECTIVES

- Understanding the scale of the universe and our place in it.
- Describing and explaining natural phenomena using the scientific method.
- Understanding the physics of astronomy at an elementary level.
- Know how astronomers learn about the universe.

KEY TOPICS

- Basic ideas and observations of modern astronomy.
- Key historical facts in the science of astronomy.
- Basic principles of physics that allow astronomers to learn about the universe.
- Telescopes, satellites, and space probes.
- Our own solar system: our Sun, formation of the solar system, geologies and atmospheres of other worlds, asteroids, and comets.
- Other worlds.
- Life on Earth and beyond.

ASSESSMENT

Students' understanding of the learning goals will be evaluated from selected questions on homework assignments, in-class activities, and exams.

COURSE PREREQUISITES

This course has no pre-requisites. It will be assumed that you know how to use a non-programmable scientific calculator.

COURSE AND INSTRUCTOR INFORMATION

- Course Time: MWF, 10:00 am to 10:50 am
- Course Location: Science building room 007, TTU campus
- Instructor: Prof. Alessandra Corsi
- Instructor's address: Science Building room 17, TTU campus
- Instructor's phone: +1-806-834-6931
- Instructor's e-mail: alessandra.corsi@ttu.edu
- Office hours: Mon 11:30 am-12:30 pm, Wed 4:00-5:00 pm (TBC)

REQUIRED TEXTBOOKS AND SUPPLIES

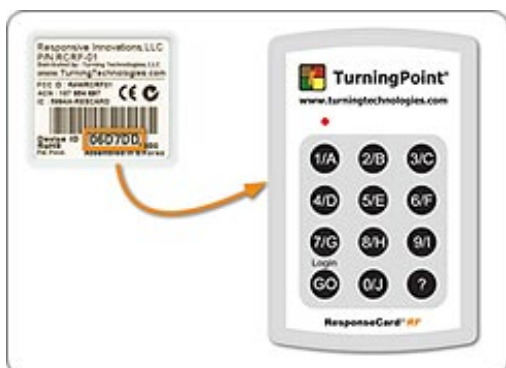
- **The Cosmic Perspective: The Solar System (7th Edition)**; by Bennett, Donahue, Schneider & Voit. This is only the solar system-focused half of the full version of the text. Please purchase the 7th edition, not older editions, as there have been considerable updates.
- **Astronomy 1400: Solar System Astronomy Lab Manual** produced by the Texas Tech Department of Physics. Lab Manual Sales: There are signs throughout the building presenting details on Lab Manual purchasing. **You MUST purchase a lab manual at these times.**
- **Turning Technologies response card (clicker).** **You MUST purchase a clicker at these times and register it on BB** (see instructions in what follows). During the first week of class, we will test the clickers so that all students can become familiar with the device. Starting from the second week of class, in-class activities using clickers will be graded.
- A non-programmable **scientific calculator**.
- Your **Texas Tech Student ID** (required for all classes and exams).

WEB TOOLS

Blackboard: <http://ttu.blackboard.com/>

The course webpage is (or will soon be) on the Blackboard (BB) system. Course announcements and homework assignments will be posted on this site. BB will also be used for electronic communications, and to post other relevant course material.

CLICKER REGISTRATION AND FAQs.



- 1) Log into Blackboard
- 2) Click the Courses tab
- 3) Select the appropriate course under Course List
- 4) From the ASTR1400 course homepage or from the left menu, click Turning Technologies Registration Tool
- 5) Click Register ResponseCard Device ID
- 6) Enter the six character hexadecimal Device ID located on the back of the ResponseCard below the barcode (see picture above).

Note that your device ID is uniquely associated to your name. You should use one and only one clicker during this course. **You will receive a zero for any in-class activity you missed because you did not have your clicker available or working properly, or because your clicker is not registered as yours on BB.** If your clicker is not working properly and you need to associate a new device ID with your name, you should contact the instructor BEFORE CLASS STARTS and ASAP. Last minute requests for clicker ID changes during class time will not be accommodated. If you are unsure whether your clicker is working, you should test it with the instructor before the start of class.

Here are a couple of FAQs (more info at <http://www.turningtechnologies.com/>):

- *Why does the ResponseCard flash different colors?*
Green: Confirmation that the RF Receiver has received a response from the ResponseCard. Orange: The ResponseCard is sending a signal and waiting for confirmation from the RF Receiver. Red: Response not received by the RF Receiver. Green and Red: In Channel Changing mode.
- *I've registered my ResponseCard but it flashes orange and my responses are not recorded?*
If your ResponseCard is on the wrong channel it will flash orange/yellow for 8 seconds. On the 9th second it will turn red. Try changing the channel on the ResponseCard. Your professor will need to tell you what channel to set the ResponseCard to (01-82). The default channel is 41. To reset your ResponseCard to channel 41, press Go-4-1-Go and then press number 1 to confirm. When you currently program the ResponseCard, the light will turn green. You may join the correct channel prior to entering class as well.

HOMEWORK ASSIGNMENTS

Approximately 11 problem sets worth 20% of the course grade will be assigned as homework (HW) throughout the semester. HW sets and corresponding solutions will be posted on BB. It is your responsibility to clearly indicate in your solution the problem / question number you are solving / answering. **Make sure to show your work and to explain what you are doing.** You will receive very little credit if you do not. **ALL PAGES OF AN ASSIGNMENT MUST BE STAPLED TOGETHER.** If an assignment is unstapled, it will be returned ungraded. **The paper that you hand in should be the**

result of your own work, with ideas expressed in your own words and with your own calculations shown. Violations of this policy are taken very seriously. You must submit your completed written HW assignment during the first five minutes of class on the day that it is due. **No late assignments will be accepted: you will receive a zero for each HW assignment you do not submit in a timely manner.** As a way to cover for extraordinary situations / extenuating circumstances (family emergencies, illness, flight cancellations, etc.), the HW assignment with the lowest grade will be dropped.

QUIZZES / IN-CLASS ACTIVITIES

Quizzes or other in-class work (most frequently administered using clickers) will be given in class without prior announcement with the primary purposes of giving you an opportunity to review the material, giving the instructor the opportunity to check your comprehension of the material, and taking attendance. The number and frequency of such graded activities is at the discretion of the instructor. **You will receive a zero for each in-class activity you miss.** The two quizzes / in-class activities with the lowest grade will be dropped from your final grade as a way to cover for extraordinary situations. Given this lenient policy, please do not contact the instructor to make up this in-class work unless you have a serious ongoing problem (e.g., your car not starting, getting stuck in traffic, or a mild, short-term illness do not qualify). The in-class work is worth 10% of the course grade. **You may need to make calculations, so you should always bring a working non-programmable scientific calculator to class.**

LABORATORY

There is a required laboratory worth 30% of the course grade. You will receive one grade for the lecture and the laboratory combined - they are not separate courses. **If you fail the laboratory portion of this class, you will fail this course.** In addition to the weekly lab meetings, you have the opportunity to visit the Texas Tech Observatory for some nighttime observations as part of your lab grade. These observational exercises are **not** optional. All necessary information regarding these activities will be posted on the observatory website (linked from the Texas Tech Department of Physics homepage); it will also be discussed by your laboratory instructor during the first week of class. If no lab is listed on your schedule, see your professor immediately. **Questions about the laboratory should be addressed to your laboratory instructor, not the lecturer.**

GRADE DISTRIBUTION

Your **final numerical course grade** will be calculated as a weighted average of:

- Midterm Exam: 15% weight
- Final Exam: 25% weight
- Homework assignments (11 total): 20% weight
- Quizzes / in-class activities: 10% weight
- Laboratory/Observing: 30% weight

No extra credit will be given. Numerical course grades will be converted into letter grades according to the following scale:

Numerical course grade	Letter grade
$\geq 90.00\%$	A
80%-89%	B
70%-79%	C
60-69%	D
$< 60\%$	F

MIDTERM EXAM POLICY

There will be one midterm exam worth 15% of the final numerical course grade. **There is no make-up day for the midterm exam** unless severe illness occurs (see class policies regarding illness). In the event of a documented direct conflict (two exams scheduled at the same time on the same day), students should contact the instructor at least 10 days before the exam. Alternative arrangements for the exam TIME (the exam day will NOT be changed) will be offered.

The midterm exam will cover material up to the date of that exam, it will be administered in the lecture room, and you will need to bring a non-programmable scientific calculator, at least two pencils (with erasers), and your Texas Tech ID.

FINAL EXAM POLICY

There will be one final exam worth 25% of the final numerical course grade. **There is no make-up day for the final exam: the Final Exam is mandatory.** The final exam is comprehensive, it will be administered in the lecture room, and you will need to bring a non-programmable scientific calculator, at least two pencils (with erasers), and your Texas Tech ID.

Final examination period for Fall 2015 will likely be on Saturday, 2015 December 5, from 1:30 p.m. to 4:00 p.m. However, the final exam date/time is tentative and **WILL BE CONFIRMED LATER IN THE SEMESTER BY THE UNIVERSITY REGISTRAR.** For this reason, **DO NOT PLAN TO LEAVE TTU BEFORE OR ON December 9th.** TTU's policy regarding final exams states:

1. ALL Final Exams must be given at the assigned time. **They may not be given prior to the officially assigned time.**
2. If a student misses their Final Exam, they must contact their Instructor. This is a matter between the student and the Instructor. The policy for this class is that **no make-up Final Exams will be given except in the event of severe documented illness.**
3. There is no policy on how many Final Exams a student can have in one day. The Final Exam Schedule was posted in the Schedule of Classes and must be followed.

For more info about the final exam policy, please visit:
<http://www.depts.ttu.edu/opmanual/OP34.10.pdf>

CLASS POLICIES

- If you use a cell phone and/or iphone and/or a personal laptop, ... etc. during class time, disturbing the lecture and/or distracting other students, **you will be asked to leave class and not return that class period**. Do not rely on your cell phone for calculations. If you have a legitimate reason for needing a laptop during class time, please speak to the instructor.
- Illness:** If **severe** illness occurs, seek treatment immediately, contact instructor when possible, and stay home. When you return with a doctor's note we will make arrangements for missed work on an individual basis. **In case of an illness that will require absence from class for more than one week, the student should notify his or her academic dean.**

DETAILED COURSE SCHEDULE (Subject to change with notice)

Wk	Class	Dates	Topic	Chap	Assignments
1	1- M	24 th Aug	Introduction	1	
	2- W	26 th Aug	Cosmic scales, age of the Universe, and Earth's motion	1	
	3- F	28 th Aug	Intro to Labs and observing	LAB Manual	HW#1 assigned
2	4- M	31 st Aug	Night sky, seasons, planetary motion	2	
	5- W	2 nd Sep	Night sky, seasons, planetary motion	2	
	6- F	4 th Sep	Night sky, season, planetary motion	2	HW#2 assigned HW#1 due
3	M	7 th Sep	Labor Day		
	7- W	9 th Sep	Copernican revolution, Kepler's laws, scientific method	3	
	8- F	11 th Sep	Copernican revolution, Kepler's laws, scientific method	3	
4	9- M	14 th Sep	Copernican revolution, Kepler's laws, scientific method	3	HW#3 assigned HW#2 due
	10- W	16 th Sep	Newton's laws, conservation laws, gravity	4	
	11- F	18 th Sep	Newton's laws, conservation laws, gravity	4	
5	12- M	21 th Sep	Newton's laws, conservation laws, gravity	4	HW#4 assigned HW#3 due
	13- W	23 rd Sep	Our star: the sun	5/14	
	14- F	25 th Sep	Our star: the sun	5/14	
6	15- M	28 th Sep	Our star: the sun	5/14	HW#5 assigned HW#4 due
	16- W	30 th Sep	Light, structure of matter, abs/emission spectra, Doppler effect	5	

	17-F	2 nd Oct	Light, structure of matter, abs/emission spectra, Doppler effect	5	
7	18-M	5 th Oct	Telescopes	6	
	19-W	7 th Oct	Solar system overview	7	HW#6 assigned HW#5 due
	20-F	9 th Oct	Explaining the solar system, Jovian and terrestrial planets	8	
8	21-M	12 th Oct	Explaining the solar system, Jovian and terrestrial planets	8	
	22-W	14 th Oct	Review for midterm exam		HW#6 due
	23-F	16 th Oct	Midterm exam	1,2,3,4,5,6,14	
9	24-M	19 th Oct	Explaining the solar system, Jovian and terrestrial planets	8	HW#7 assigned
	25-W	21 st Oct	Planetary geology	9	
	26-F	23 rd Oct	Planetary geology	9	
10	27-M	26 th Oct	Planetary geology	9	HW#8 assigned HW#7 due
	28-W	28 th Oct	Planetary atmospheres, Earth, and terrestrial worlds	10	
	29-F	30 th Oct	Planetary atmospheres, Earth, and terrestrial worlds	10	
11	30-M	2 nd Nov	Planetary atmospheres, Earth, and terrestrial worlds	10	HW#9 assigned HW#8 due
	31-W	4 th Nov	Jovian planets	11	
	32-F	6 th Nov	Jovian planets	11	
12	33-M	9 th Nov	Jovian planets	11	HW#10 assigned HW#9 due
	34-W	11 th Nov	Asteroids, comets, dwarf planets	12	
	35-F	13 th Nov	Asteroids, comets, dwarf planets	12	
13	36-M	16 th Nov	Other distant worlds	13	
	37-W	18 th Nov	Other distant worlds	13	
	38-F	20 th Nov	Life on Earth and beyond	24	
14	39-M	23 th Nov	Life on Earth and beyond	24	HW#11 assigned HW#10 due
	W	25 th Nov	Thanksgiving break		
	F	27 th Nov	Thanksgiving break		
15	40-M	30 th Nov	Review for final exam - part I		
	41-W	2 nd Dec	Review for final exam - part II		HW#11 due
	S	5 th Dec	Final Exam	All covered	

ACADEMIC INTEGRITY

I support the TTU Code of Student conduct. Essentially, it states: "It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension." For the remainder of the code, see: <http://www.depts.ttu.edu/opmanual/OP34.12.pdf>

RELIGIOUS HOLYDAYS

Texas law requires institutions of higher education to excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day. The student shall also be excused for time necessary to travel. An institution may not penalize the student for the absence and allows for the student to take an exam or complete an assignment from which the student is excused. While no prior notification of the instructor is required, OP 34.19 indicates that a student who intends to observe a religious holyday should make that intention known to the instructor prior to the absence. The student should make up any missed work. For more information, please visit: <https://www.depts.ttu.edu/opmanual/OP34.19.pdf>

DISABILITY SERVICES

<http://www.depts.ttu.edu/opmanual/OP34.22.pdf>

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note: instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services in 335 West Hall or call 806.742.2405.

UNIVERSITY COUNSELING CENTER

The university experience can be a time of substantial growth for students, filled with changes, challenges and new decisions. Few students move through this time without some personal turbulence, and many experience periods of trauma, crisis, stress, and confusion. The Student Counseling Center staff is available to help students with any problems they may be experiencing. For more information, please visit: <http://www.depts.ttu.edu/scc/>

SECURITY

It is very important that you familiarize yourself with the emergency procedures for evacuation, fire, flood, medical, violence and workplace threats, and tornado. You can find these procedures at the following link:

<http://www.depts.ttu.edu/communications/emergency/procedures.php>

In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location. When clear of the building please continue away from the building and meet class Instructor at Memorial Circle.

EMERGENCY NOTIFICATIONS AND ALERTS

TechAlert! is the principal method that the University uses to communicate emergency situations and class cancellations or delays. If you have not already done so this semester, update cell phone, home phone or text message information at: <https://appserv.itts.ttu.edu/EmergencyAlert/>