

Phys 104: Astronomy

Summer 2016

Course Description: Descriptive Astronomy is an introductory course intended for students with an interest in the stars and planets. This course introduces the motion of the stars and planets, the properties of the solar system and its development, and the lives of stars. These ideas will be taught in such a way as to emphasize how astronomers know the properties of the universe and then use their observations to construct scientific models about how the universe works.

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Office Hours: M, W 6:30 - 7:00 pm or by appointment
Class: OWS 166 **M-Th** 7:00 pm - 9:30 pm
Course Web Page: <http://ida.phys.stthomas.edu/astro/>

Required Materials:

- **Lecture Tutorials for Introductory Astronomy, 3rd Edition**, Prather et al, Pearson Publishing. (2013) *Note: you MUST have 3rd edition.*
- **Cosmic Perspective, 7th edition** Bennett, Donahue, Schneider and Voit, Pearson Publishing. This is a very good textbook but expensive, so find it where you can.
- **Mastering Astronomy** online code (*purchase of code comes with e-text*).

Understanding physics means understanding the underlying concepts and principles instead of focusing on memorizing and using equations. However you should be able to use equations on a basic algebraic level. If you are uncertain, please come ask me for help.

Course Goals: At the end of this course, the student will be able to:

1. Critically assess scientific ideas to tell the difference between science and pseudoscience, and apply this knowledge to popular articles and news on astronomy.
2. Draw connections between astronomy and other areas of knowledge.
3. Understand the place of humanity in the Universe.

Course Objectives: Students will, by the end of this course, be able to:

1. Explain what makes a scientific theory valid.
2. Describe the motions of the sky in scientific terms.
3. Compare different kinds of planets and stars.
4. Explain scientific models related to the evolution of the solar system.
5. Describe scientific models related to stellar evolution.
6. Describe processes involved in our own galaxy.
7. Discuss the evolution of the universe.
8. Evaluate the possibilities of life in the Universe.
9. Explain how scientists have made the basic observations that have contributed to the scientific models on which our understanding of the universe is based.

Course Policies

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Attendance

Please be punctual. Lateness is a major inconvenience for the other members of the class. A percentage of points will be deducted from your participation score if you are late. To be successful in this course, attendance at all activities is essential. If you cannot attend a class, you must let me know prior to that class or have a medical note. **Excessive absences will result in an F grade.**

Evaluation	Essay/Lesson Plan	15%
	Labs	15%
	Homework	8%
	Group Project	15%
	Participation	7%
	Midterm Exam	20%
	Final Exam	20%

Grades:

Based *approximately* upon the distribution as follows:

92 – 100	A
90 – 91.9	A-
88 – 89.9	B+
82 – 87.9	B
80 – 81.9	B-
78 – 79.9	C+
72 – 77.9	C
70 – 71.9	C-
68 – 69.9	D+
62 – 67.9	D
60 – 61.9	D-
0 – 59.9	F

Academic Standards

In the process of conducting scientific work, it is essential that an attitude of trust and honesty exists between all participants. In the Physics Department, we have an honor code. We expect you to behave honorably in all aspects of your life. This means that we trust you. For example, you are free to leave the room during a test without asking me. We take this trust seriously and a breach of trust has severe consequences. Cheating in any form is grounds for dismissal from the course with a grade of F.

Examinations

Exams may consist of multiple choice, short answer, and/or essay questions. You are allowed a calculator on the exams, although you should not need one. The final exam will be comprehensive. Exams CANNOT be made up or rescheduled (except for accommodations). Use of cell phones, pagers, messaging PDAs, or other wireless communication devices (including laptops for e-mail) is not permitted at any time during exams.

Electronic Devices

Cell phones or similar devices may be used to take photos or voice record my lectures, or otherwise used for appropriate classroom activities. However, please be considerate of your fellow students and myself, and conduct your e-business outside of the classroom or on breaks.

Accommodations

Any students with special learning needs or disabilities should contact me as soon as possible so that accommodations may be made. *This is especially important in the summer, where class moves very quickly!* Students are encouraged to register with the Enhancement Program for disability verification and determination of reasonable academic accommodations.

Students who need accommodations for religious purposes (e.g. fasting, etc.) or other purposes should contact me as soon as possible.

Ethics

There are many issues that our society faces that can be challenging for students, colleagues and yes, even professors. In this class I expect that we will come to the table willing to listen and learn and assume people who are telling their narratives know best about their experiences. While this is a science class, science is not divorced from the human experience, and it is important to recognize that Title VI and Title IX and ADA compliance apply. This means racial, gender, sexual, and disability harassment will not be tolerated.

Course Schedule

**Indicates optional further reading*

Day	Topic	Chapter Reading	Assignments	Labs
Jul 11-12	Motion in the Night Sky Science vs. Pseudoscience Historical Perspective	CP: 2, 3, S1*, 4		Solar Heating
Jul 13-14	Measuring the Universe: Light, Thermal Radiation & Spectroscopy	CP: 5, 10	<i>Essay Topic Check</i> <i>GP: Abstract & responsibilities due</i>	Spectroscopy
Jul 18-19	Telescopes	CP: 6		Jupiter's Moons, Part 1
Jul 20-21	The Solar System: Overview & Formation, Asteroids & Comets	CP: 7, 8		Jupiter's Moons, part 2
Jul 25-26	Comparative Planetology: Terrestrial Planets	CP: 9, 10	<i>Essay/Lesson Plan due</i>	Impacts
Jul 27	Moons, Rings, & Dwarf Planets Jovian Planets Extra-Solar Planets	CP:10, 11, 12	<i>GP: Check-in</i>	
Jul 28	Midterm Exam			No Lab
Aug 1-2	Weather & Climate Change The Sun Stellar Properties	CP: 13, 14, 15, 24*	<i>Peer Review due</i>	HR Diagram 1
Aug 3-4	Stellar Properties Interstellar Medium Star Formation	CP 15, 19.2, 16	<i>GP: Detailed description /drawings</i>	HR Diagram 2
Aug 8-9	Stellar Evolution Dead Stars	CP: 17, 18	<i>Essay/Lesson Plan revision due</i>	X-ray Supernovae
Aug 10-11	Our Galaxy Measuring Distances	CP: 19, 20	<i>GP: presentation outline</i>	Exobiology
Aug 15-16	Other Galaxies & Cosmology	CP: 21, 22, 23		Galaxy Classification
Aug 17	Group Project Presentations		<i>Group Projects</i>	No Lab
Aug 18	Final Exam			No Lab