

Physics 1040: Introductory Astronomy Fall 2016 Semester, Syllabus

Lecture Room: ESLC 130 (large lecture theater); Tue and Thu 1:30-2:45pm

Instructor: Mike J. Taylor, SER Building, Second floor, room 220C, Tel: 797-3919,
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Instructor Office Hours: Tuesdays and Thursdays after lectures (3-5 pm)

Teaching Assistant: Jonathan Pugmire, e-mail: jon.pugmire@aggiemail.usu.edu

Undergraduate Teaching Fellow: To be assigned

Note: Additional supplementary instruction classes will be conducted by UTF weekly during the semester (days and times to be announced). You are strongly encouraged to participate in these classes to help you with any problems and to further improve your understanding of the class material.

Text (REQUIRED): *The Essential Cosmic Perspective (any more recent editions)* by J. Bennett, M. Donahue, N. Schneider and M. Voit, ISBN:0321566947. Note that **earlier editions may also be acceptable** for this course as all the homework will be done online using “Canvas”.

Lab Fee: There is a \$10.00 lab fee for this class. It covers maintenance and supplies for the Physics Department Observatory. (Note: Some scholarships will not pay for this fee, even though they pay full tuition costs. Scholarship students have been dropped from the class without notice for not paying the fee.)

Prerequisite: There are **NO prerequisite classes** for this course. However, as stated in the course catalog, a working ability at the high school mathematics level is expected. This is equivalent to USU Math 0900 and 1010.

Goals: This is a great class that will introduce you to many key aspects of astronomy. During the course we will study the heavens as viewed from Earth, our solar system, the Sun, stellar evolution, galaxies, black holes and beyond! Our goal is to help you learn the fundamentals of astronomy and experience the universe as we know it today. This will include how scientists have discovered many amazing facts and how we continue to expand our boundaries of this knowledge. This is an introductory course and there is a lot to discover and enjoy as we progress. Your learning experience will be greatly enhanced if you can make time to read the relevant chapter sections prior to each class.

Disability Note: If there is any student in this class who has a disability that will require some accommodation by the instructor, that student should contact the instructor and the Disability Resource Center (797-2444) as soon as possible. Persons with disabilities that

may prevent them from observing through the telescope should contact the instructor to make alternate arrangements.

Honor Code: The USU honor code will be strictly enforced in this class. Any suspected violations of the honor code will be promptly reported to the honor system. Policies regarding the honor code will be enforced and can be found at: <http://www.usu.edu/policies/PDF/Acad-Integrity.pdf>

Course Activities:

Lectures: will focus on basic physics concepts and current astronomical knowledge. Please read appropriate chapter section to aid your learning prior to class.

Homework: will be **weekly**, mainly in the form of **multiple choice questions** with short answers and will be performed online using “Canvas”. Homework will be due each Friday by midnight (**HW #1 due Fri. 09 Sep**). You will do 14 homeworks and your total homework grade will be determined by your **12 highest scores**.

Tests: This course comprises **four tests**. They will all be in the same general format as the homework and will be held during designated class periods (see attached syllabus). They will be closed book and closed notes and of equal weighting. **No cell or smart phones allowed**. You should be prepared to present a photo ID during each test. Due to the large size of this class the tests will use “Scantrons” which will be provide to you.

Observation Projects: These are a fun “hands-on” experience and will include the opportunity to use **telescopes at the USU Observatory** and to participate in **Night-Sky viewing sessions** where you will learn about the constellations, planets and other deep-space celestial phenomena. These will be conducted from the roof of the SER building on campus (a map will be provided in class). You will perform **THREE** observation projects during the fall semester:

1. Observing the night-time sky, stars and constellations by eye
2. Observing the Sun; sunspots and flares (using special telescopes only)
3. Viewing deep-space objects (binary stars, nebula, globular clusters, galaxies)

The due dates for these projects are given in the syllabus. Further details on the projects will be provided in class. **The Observatory opens Tuesday 6th September**. Regular observatory times are **Monday through Thursday** (weather permitting) hours TBA. Student instructors will guide you in your star gazing. You can call the observatory (435-797-2942) prior to attending to make sure it will be open that night. **You are strongly advised to perform your observing projects early in the term while the weather is still good.**

Grading: Your final grade will be determined as follows:

4 Tests:	50% total
3 Observation Projects:	30% total
14 Homeworks:	20% total (lowest 2 scores dropped)
Grand total:	100%

PHYS 1040: Introductory Astronomy Fall 2016 Syllabus

Week	Date	Lecture	Chapter
Section 1: Night Sky Astronomy and Concepts, Chapters 1-5			
1	Aug 30 Sep 01	Syllabus Review and quick “Tour of the Universe” Night Sky Motions, Constellations, Seasons	1 2
2	Sep 06 06 08	Observatory opens. Project 1: “Observing the night sky..” starts Moon Phases, Eclipses, Early Astronomy, Heliocentric System Kepler’s Laws, Newton’s Laws, Conservation Laws	- 2, 3 4
3	Sep 13 15	Gravity, Orbits, Energy, Light, Electromagnetic Spectrum Astronomy using Temperature, Light, and Spectra	4, 5 5
4	Sep 20 22 22	Telescopes for Astronomical Measurements Test 1 Project 2: “Observing the Sun...” starts (outside ESLC)	5 1-5 -
Section 2: Our Solar System, Chapters 6-10			
5	Sep 27 29	Tour of the Solar System “Nebular Theory” for the Solar System Formation	6 6
6	Oct 04 06 06	Earth: Structure and Composition The Terrestrial Planets Project 1: “Observing the night sky....” Due	7 7 -
7	Oct 11 11 13	The Jovian Planet Systems Project 4: “Deep space observations” starts Jovian Planet Moons and Rings	8 - -
8	Oct 18 18 20	Asteroids, Comets, Dwarf Planets Project 2: “Observing and measuring the Sun....” Due No Class Day (Friday schedule)	8 - 9,10
9	Oct 25 27	Extra Solar Planetary Systems Test 2	6-10 6-10
Section 3: Stars and Stellar Evolution, Chapters 11-14			
10	Nov 01 03	Our Star the Sun: Interior, Atmosphere, Cycles and Sunspots Fusion and Properties of the Stars	11 11, 12
11	Nov 08 10	Stellar Classifications, H-R Diagram, Birth of Stars The Life and Death of Low and High Mass Stars	12, 13 13
12	Nov 15 17	Stellar Graveyard, White Dwarfs, Neutron Stars, Black Holes Test 3	14 11-14
Section 4: Galaxies and Cosmology, Chapters 14-18			
13	Nov 22 24	Our Galaxy the “Milky Way”, and What Lies at its Center No Class (Thanksgiving)	15 -
14	Nov 29 Dec 01 01	Galaxies Everywhere! Their Classification and Evolution Active Galaxies, Quasars, Radio Galaxies, Hubble’s Law Project 3: “Deep-space observations.....” Due	16 16 -
15	Dec 06 08	Cosmology: The “Big Bang Theory” and its Evidence Dark Matter, Dark Energy and the Fate of the Universe	17 18
	Dec 13	Final Test: Tue. from 1:30 – 3:20pm, in ESLC room 130	15-18

Homework due each Friday by midnight (no homework first week). No exceptions for late homework.

Grading Structure:

> 92.5 A

90.0 - 92.5 A -

87.5 - 90.0 B +

82.5 - 87.5 B

80.0 - 82.5 B -

77.5 - 80.0 C+

72.5 - 77.5 C

70.0 - 72.5 C -

67.5 - 70.0 D+

60.0 - 67.5 D

< 60.0 F