

Physics 1040: Introductory Astronomy Fall 2018 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: 435-797-3919,
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Instructor Office Hours: Tuesdays and Thursdays after lectures (3-5 pm)

Associate Instructor (Section 1): James Coburn, SER Building, 435-797-3014

Teaching Assistant: David Soward, SER 209, e-mail: david.soward@aggiemail.usu.edu

Undergraduate Teaching Fellow: Dane Adams, e-mail: dane.adams@aggiemail.usu.edu

Note: Additional Supplementary Instruction classes will be conducted by Dane weekly during the semester (regular 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): *Mastering Astronomy for Essential Cosmic Perspective*, 8e by J. Bennett, M. Donahue, N. Schneider and M. Voit, ISBN: 9780134602080 Note that this is also where the homework will be completed.

Lab Fee: There is a small 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 great class 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 Resource Center: USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the Disability Resource Center (DRC) as

early in the semester as possible (University Inn # 101, 435-797-2444, drc@usu.edu). All disability related accommodations must be approved by the DRC. For example, disabilities that may limit observing through the telescopes. Once approved, the DRC will coordinate with faculty to provide assistance.

Honor Code: The honor code will be strictly enforced in this course. Any suspected violations of the honor code will be promptly reported to the honor system. For more information, please visit: <http://studentconduct.usu.edu/studentcode/article6>

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**, using **Mastering Astronomy**. Homework will be due each Sunday by midnight (**e.g. HW #1 due Sun 09 Sep**). You will do 14 homeworks and your total homework grade will be determined by your **12 highest scores** (i.e. 2 lowest scores dropped).

Tests: This course comprises **four tests**. They will all be in the same general format as the homework and will be held in the **testing center**. 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.

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 anticipated due dates for these projects are given in the syllabus (may be changed as course progresses-due to weather). Further details on the projects will be provided in class. **The Observatory opens Tuesday 4th 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 2018 Syllabus

Week	Date	Lecture	Chapter
Section 1: Night Sky Astronomy and Concepts, Chapters 1-5			
1	Aug 28 30	Syllabus Review and quick “Tour of the Universe” Night Sky Motions, Constellations, Seasons	1 2
2	Sep 04 04 06	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 11 13	Gravity, Orbits, Energy, Light, Electromagnetic Spectrum Astronomy using Temperature, Light, and Spectra	4, 5 5
4	Sep 18 20 20	Telescopes for Astronomical Measurements Review and Test 1 Opens Project 2: “Observing the Sun...” Starts (outside SER see map)	5 1-5 -
Section 2: Our Solar System, Chapters 6-10			
5	Sep 25 27	Tour of the Solar System “Nebular Theory” for the Solar System Formation	6 6
6	Oct 02 04 04	Earth: Structure and Composition The Terrestrial Planets Project 1: “Observing the night sky....” Due	7 7 -
7	Oct 09 09 11	The Jovian Planet Systems Project 3: “Deep space observations” Starts Jovian Planets	8 - -
8	Oct 16 16 18	Jovian Moons and Rings Project 2: “Observing and measuring the Sun....” Due Asteroids, Comets, Dwarf Planets	8 - 9,10
9	Oct 23 25	Extra Solar Planetary Systems Review and Test 2 Opens	6-10 6-10
Section 3: Stars and Stellar Evolution, Chapters 11-14			
10	Oct 30 Nov 01	Our Star the Sun: Interior, Atmosphere, Cycles and Sunspots Fusion and Properties of the Stars	11 11, 12
11	Nov 06 08	Stellar Classifications, H-R Diagram, Birth of Stars The Life and Death of Low and High Mass Stars	12, 13 13
12	Nov 13 15	Stellar Graveyard, White Dwarfs, Neutron Stars, Black Holes Review and Test 3 Opens	14 11-14
Section 4: Galaxies and Cosmology, Chapters 15-18			
13	Nov 20 22	Our Galaxy the “Milky Way”, and What Lies at its Center No Class (Thanksgiving)	15 -
14	Nov 27 29 Dec 04	Galaxies Everywhere! Their Classification and Evolution Active Galaxies, Quasars, Radio Galaxies, Hubble’s Law Project 3: “Deep-space observations.....” Due	16 16 -
15	Dec 04 06	Cosmology: The “Big Bang Theory” and its Evidence Dark Matter, Dark Energy and the Fate of the Universe	17 18
	Dec 10	Final Test: Mon-Thur., 10-13th Dec	15-18

Homework due each Sunday by midnight (no homework first week). No exceptions 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