

## Physics 1040: Introductory Astronomy Fall 2019 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:** Tuesday after lectures (3-5 pm)

**Teaching Assistant:** David Soward, SER 209, e-mail: [david.soward@aggiemail.usu.edu](mailto:david.soward@aggiemail.usu.edu),  
**Office hours:** Wednesday and Thursday 11-12 am

**Undergraduate Teaching Fellow:** Dane Adams, e-mail: [daneadams55@gmail.com](mailto:daneadams55@gmail.com)

Note: Additional supplementary instruction classes will be conducted 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):** *ESSENTIAL COSMIC PERSPECTIVE LOOSE-LEAF*, by J. Bennett, M. Donahue, N. Schneider and M. Voit, ISBN: 9780134532455, (8<sup>th</sup> Edition).

### **NOTE:**

**Earlier editions of this book are acceptable to use** (but the latest edition will have the most up-to-date information.) We will cover all material necessary for the tests in the lectures.

**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 about the fundamentals of astronomy and to 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](mailto: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. Notes will be posted after class.

**Homework:** will be **weekly**, using **Canvas**. Homework will be due each Wednesday by 5pm (**e.g. HW #1 due Wed 11 Sep by 5pm**). 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 in the **Testing Center**. They will be closed book and closed notes and of equal weighting. **No cell or smart phones/watches 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 is provided on CANVAS and 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 3<sup>rd</sup> 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)
<b>Grand total:</b>	<b>100%</b>

**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

### PHYS 1040: Introductory Astronomy Fall 2019 Syllabus

Week	Date	Lecture	Chapter
<b>Section 1: Night Sky Astronomy and Concepts, Chapters 1-5</b>			
1	Aug 27 29	Syllabus Review and quick “Tour of the Universe” Night Sky Motions, Constellations, Seasons	1 2
2	Sep 03 03 05	<b>Observatory opens. Project 1: “Observing the night sky..” starts</b> Moon Phases, Eclipses, Early Astronomy, Heliocentric System Kepler’s Laws, Newton’s Laws, Conservation Laws	- 2, 3 4
3	Sep 10 12	Gravity, Orbits, Energy, Light, Electromagnetic Spectrum Astronomy using Temperature, Light, and Spectra	4, 5 5
4	Sep 17 19 19	Telescopes for Astronomical Measurements <b>Test 1 open</b> <b>Project 2: “Observing the Sun...” Starts (outside ESLC)</b>	5 1-5 -
<b>Section 2: Our Solar System, Chapters 6-10</b>			
5	Sep 24 26 26	Tour of the Solar System “Nebular Theory” for the Solar System Formation <b>Project 1: “Observing the night sky....” Due</b>	6 6
6	Oct 01 03 03 03	Earth: Structure and Composition The Terrestrial Planets <b>Project 2: “Observing and measuring the Sun....” Due</b> <b>Project 3: “Deep space observations.....” Starts</b>	7 7 -
7	Oct 08 10	The Jovian Planet Systems Jovian Planets	8 8
8	Oct 15 17	Jovian Moons and Rings Asteroids, Comets, Dwarf Planets	8 9,10
9	Oct 22 24	Extra Solar Planetary Systems <b>Test 2 open</b>	6-10 6-10
<b>Section 3: Stars and Stellar Evolution, Chapters 11-14</b>			
10	Oct 29 31	Our Star the Sun: Interior, Atmosphere, Cycles and Sunspots Fusion and Properties of the Stars	11 11, 12
11	Nov 05 07	Stellar Classifications, H-R Diagram, Birth of Stars The Life and Death of Low and High Mass Stars	12, 13 13
12	Nov 12 14 14	Stellar Graveyard, White Dwarfs, Neutron Stars, Black Holes <b>Test 3 open</b> <b>Project 3: “Deep-space observations....” Due</b>	14 11-14
<b>Section 4: Galaxies and Cosmology, Chapters 15-18</b>			

13	Nov 19 21	Our Galaxy the “Milky Way”, and What Lies at its Center Galaxies Everywhere! Their Classification and Evolution	15 -
14	Nov 26 28	Active Galaxies, Quasars, Radio Galaxies, Hubble’s Law No Class (Happy Thanksgiving!)	16 16-
15	Dec 03 05	Cosmology: The “Big Bang Theory” and its Evidence Dark Matter, Dark Energy and the Fate of the Universe	17 18
	<b>Dec 10</b>	<b>Final Test: Testing Center Dec 9<sup>th</sup> (provisional)</b>	15-18

Homework due each Wednesday by noon (no homework first week). No exceptions late homework.