

# INTRODUCTION TO ASTRONOMY

PHYSIC 114 (4 Credit Hours)

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## **Course Content:**

- Unit 1: Exploring the Sky  
*The sky, origins of modern astronomy, astrophysics and telescopes.*
- Unit 2: The Stars  
*Light, the sun, stellar formation and evolution.*
- Unit 3: The Universe  
*Galaxies including the Milky Way and cosmology.*
- Unit 4: The Solar System  
*Its origin, the eight planets, meteors, asteroids, and comets.  
Earth and it's atmosphere.*

## **Course-Level Goals:**

1. To develop an open-minded attitude toward scientific knowledge.
2. To understand how modern astronomy endeavors to provide new understanding in all areas of science as exemplified by energy mechanisms, relativity, conditions for life in the universe, and methods of scientific measurement.
3. To acquire a basic experience relating to astronomical topics appearing in current publications as exemplified by quasars, neutron stars, and black hole.
4. To understand the opportunity for a creative avocation in astronomy and an acquaintance with the local opportunities for a continued non-professional interest in the subject through the facilities, study groups, and activities of the Peoria Astronomical Society and the Peoria Riverfront Museum Planetarium.

**Required Text:** Seeds/Backman, *Foundations of Astronomy*, 12<sup>th</sup> or 13<sup>th</sup> Edition, Brooks/Cole, Cengage Learning, Boston, MA.

**Expectations:** Complete homework assignments on time. Ask questions and get help when you don't understand. **Be courteous to those around you.** You should expect up to **two** hours of homework for every **one** hour of lecture in class. In order to get anything out of this course, you must put something into it. Participation is expected from all.

**Grading:** For ICC: 90.00 - 100% A, 80.00 - 89.99 % B, 70.00 - 79.99 % C, 60.00 - 69.99 % D, 0 - 59.99 % F  
For MHS, see Student Handbook. **The teacher does not give a student a grade, he or she earns it!**

$$\text{Semester grade} = \frac{\text{your points}}{\text{total points possible}} \times 100$$

## **Evaluation of Student Achievement:**

1. Tests - Test material will be taken from lecture notes, reading assignments from the textbook, homework assignments, and labs.
2. Quizzes (Usually 10 pts. each)
3. Laboratory exercises  
This will include 1 field trip to the planetarium and approx.. 2 local evening observing sessions, weather permitting.
4. Homework  
Homework assignments will be collected. Homework will be due at the **beginning** of class and will **not** be accepted after the due date.

### 5. Magazine article summaries

You will be expected to read and summarize full **length (more than 2 full pages, not counting pictures)** astronomy related **magazine** articles. The articles cannot be more than **4** years old. One article should pertain to each of the four units we will cover in class. **The summary should be at least 1 1/2 pages typed, double-spaced, in length. Use size 12 font with 1 inch margins.** Please include the following information on your **cover page**: Title of article, unit number, your name, and the date. Include a link or copy of your article, which has been **highlighted** by you, to the back of your summary. At the end of the summary, include a **bibliography** in the following format:

Marcy, Geoff. "Hunting Planets Beyond." *Astronomy*, March 2000: pp. 42-47.

I suggest the following magazines: *Astronomy*, *Sky and Telescope*, *Discover*, *Science*, and *Scientific American*. Each summary will be due on or before the test date for that unit. No late summaries will be accepted. Hand them in early if you will not be able to turn them in on their due dates.

### Class Schedule:

Lecture: Three hours per week.

Lab: Two hours per week.

### Course Content :

1. Perspectives
  1. Development of astronomical thought
  2. Astronomy as a science
  3. Contributions of astronomy
2. Planetarium and Observatory fundamentals
  1. Equator system of star coordinates
  2. Sidereal time
  3. Star maps
  4. Telescopes
3. The celestial sphere
4. Constellations
5. Four astronomers and contributions
  1. Kepler and laws
  2. Galileo and discoveries
  3. Newton and laws
  4. Einstein and general relativity
6. Tides/eclipses
7. The moon, its motions, and description

8. The size and structure of the universe
9. Fundamental properties of stars
  1. The sun
  2. The interstellar medium
  3. The evolution of stars
  4. Novae
10. The evolution of galaxies
11. Interstellar contact by radio and probes
12. Neutron stars, quasars, black holes and white holes
13. Tests and review

**Laboratory exercises:**

1. Measurements in astronomy
2. Plotting stars in the night sky
3. Plotting orbits of planets
4. Studying force and mass
5. A scale model of the universe
6. Solar observations
7. Locally visible messier objects
8. The HR diagram
9. Spiral arms of galaxies
10. Locating the planets
11. Telescopes
12. Study of the visual spectrum
13. Planetary evolution
14. X-ray sources

*\*The above labs are subject to change.*