

**UNIVERSITY OF PUERTO RICO
RIO PIEDRAS CAMPUS
COLLEGE OF NATURAL SCIENCES
DEPARTMENT OF PHYSICS
UNDERGRADUATE PROGRAM**

Title: Introduction to Astronomy

Code: ASTR3005

Number of Credits: 3

Prerequisites: Students are expected to have a working knowledge of algebra.

Description

This course is intended to provide a general introduction to astronomy at a phenomenological level. Students are expected to have a working knowledge of algebra. It covers a wide variety of topics, including: a historical introduction and modern astronomy, the sky and coordinates systems, instrumentation in astronomy, the nature of light, the Solar System, evolution stars, galaxies, and Cosmology. At the level of "Astronomy. A Beginner's Guide to the Universe." Chaisson and McMillan".

Objectives

The ASTR3005 have the following goals according to the recommendations for introductory astronomy courses in the "Report on Workshops for Department Leaders" (2003):

Content goals:

Students should gain:

1. A cosmic perspective—a broad understanding of the nature, scope, and evolution of the Universe, and where the Earth and Solar System fit in
2. An understanding of a limited number of crucial astronomical quantities, together with some knowledge of appropriate physical laws
3. The notion that physical laws and processes are universal
4. The notion that the world is knowable, and that we are coming to know it through observations, experiments, and theory (the nature of progress in science).
5. Exposure to the types, roles, and degrees of uncertainty in science.
6. An understanding of the evolution of physical systems
7. Some knowledge of related subjects (e.g., gravity and spectra from physics) and a set of useful "tools" from related subjects such as mathematics
8. An acquaintance with the history of astronomy and the evolution of scientific ideas (science as a cultural process)
9. Familiarity with the night sky and how its appearance changes with time and position on Earth

Skills, Values, and Attitudes goals:

Students will be exposed to:

1. The excitement of actually doing science

2. The evolution of scientific ideas (science as a cultural process)
3. Students should be introduced to how science progresses and receive training in:
The roles of observations, experiments, theory, and models
4. This course will encourage the students to feel more interested in science and better equipped to follow scientific arguments in the media.

Course Content

Topic	Assigned time (hours)
1. Coordinate Systems	3
2. Stellar Maps	3
3. Models of the Cosmos	3
4. Electromagnetic waves and Doppler Effect	3
5. Spectroscopy	3
6. Telescopes	3
7. Solar System	3
8. The Sun	3
9. Blackbody Radiation	3
10. Hertzsprung-Russell Diagram	3
11. Stellar Evolution	3
12. Milky Way	3
13. Normal Galaxies	3
14. Hubble's Law and Large Scale Structure of the Universe	3
15. Cosmology	3
Total hours	45 contact hours

Instructional Strategy

The strategy of instruction is a combination of lectures, laboratory experiences,

audiovisual material, demonstrations, and class activities. During the semester special activities are scheduled, such as a visit to the Arecibo Observatory or telescope observations at different locations in Puerto Rico. The students are assigned readings and review questions from the textbook. Course materials and assignments are made available to the students through the "Blackboard" platform.

Minimum Required Facilities

Traditional lecture room

Student Evaluation

The students evaluation is based on 4 partial exams (60% of final grade), laboratory experiences (30%) and class activities (40%).

Grading System

The overall score is determined by calculating the percentage of points obtained by the student. Grades are then assigned according to the standard curve: 100-90% = A, 89-80% = B, 79-70% = C, 69-60% = D, 59-0% = F.

Bibliography

"Astronomy. A Beginner's Guide to the Universe." Chaisson and McMillan

"Goals for "Astro 101": Report on Workshops for Department Leaders" Partridge, B., and Greenstein G., The Astronomy Education Review, Issue 2, Volume 2:46-89, 2004.

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