

COURSE PROPOSAL FOR REVISED GENERAL EDUCATION COURSE

PHY 1055G -- Principles of Astronomy

1. Catalog Description

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| a. | Course level: | PHY 1055G |
| b. | Title: | Principles of Astronomy |
| c. | Credit | 3-0-3 |
| d. | Term to be offered: | F |
| e. | Short title: | Astronomy |
| f. | Course description: | An introduction to the solar system, planets, stars, galaxies, evolution of stars, neutron stars, black holes, cosmology, and the structure of the early universe. Physics 1056G must be taken concurrently. Credit for PHY 1055G will not be granted if the student already has credit for PHY 1095G or 3045G. |
| g. | Prerequisite: | None |
| h. | The course is writing-active. | |

2. Student Learning Objectives

In successfully completing this course, students will:

- understand how Astronomy formed our present understanding of the laws in the universe. (citizenship)
- analyze Astronomy homework and exam problems and synthesize solutions of astronomical problems by applying the appropriate set of physical and mathematical concepts. (critical thinking)
- identify and use the appropriate physical and mathematical laws to quantifiably explain phenomena that occur in the natural world and in various disciplines. (critical thinking)
- become scientifically literate and thus able to participate in governmental issues related to space, scientific funding for pure versus applied research and the environment. (citizenship)
- be able to apply problem-solving techniques in the areas of Astronomy and Physics, Geology and Geography. (critical thinking)

3. Course Outline

<u>Week</u>	<u>Content</u>
1	The Celestial sphere, seasons, distance scales
2	Lunar and solar eclipses, phases of the moon, magnitude scale
3	Gravitation, motion of the planets, mechanics
4	Mechanics continued, the nature of light and matter, radiation
5	The nature of light and matter, spectra and the Bohr model
6	The solar system, Earth, Venus, Mercury, Mars
7	Jovian planets, Jupiter, Saturn, Uranus, Neptune
8	Comets, asteroids, origin of the solar system
9	Stars, our Sun, nuclear reactions
10	Evolution of stars, Hertzsprung - Russell Diagram

- 11 Birth and death of stars, white dwarfs
- 12 Neutron stars and black holes
- 13 Galaxies and Hubbel's red shift
- 14 Quasars and cosmology
- 15 Cosmology and the early universe

4. Evaluation of Student Learning

- a.** Achievement of student learning will be evaluated based on the following:

Solutions to homework (word problems)	20%
Three hour exams	60%
Final Exam	20%

Each of the above involves identifying the relevant information in the statement of the problem, selecting the appropriate strategy for analyzing the information, and using appropriate mathematical tools and techniques to solve the problem.

- b.** This course is writing-active; many of the exam questions are in the form of essays and short answers.

5. Rationale

- a. Segment**

This course will be placed in the physical science component of the scientific awareness segment of the general education program. The course meets the requirements of that segment since students in this course must:

- (1) synthesize solutions by applying the appropriate set of physical and mathematical concepts to Astronomy homework and exam problems. (critical thinking)
- (2) identify and use the appropriate physical and mathematical laws to quantifiably explain astronomical phenomenon in the observed Universe, and apply in various disciplines to the study of Astronomy. (critical thinking)

- b. Level and prerequisites**

This course is the first course in astronomy and is therefore, appropriately, a freshman level course. The only co-requisite is enrollment in the astronomy laboratory, PHY 1056G.

- c. Indicate similarity to existing courses and effect upon programs of any department**

- (1) Justify course if it is similar to an existing course.**

This course PHY 1055G (3-0-3), is an expansion of PHY 1055C (2-0-2), with the addition of one hour of lecture. It will maintain the same curriculum ID as PHY1055C, but will allow a more complete coverage of both stars galaxies and an expansion of solar system astronomy that was not possible in only two hours of lecture. It will also bring 1055G in line with the existing Honors Astronomy, which is already a three-hour course.

- (2) **Cite courses to be deleted if the new course is approved, the exceptional need to be met, or the obvious gap to be filled**
No courses will be deleted or added. This is a revision of an existing course.
- (3) **Describe any relevant program modification if the course is approved**
No modifications of any programs are expected.

- d. **Specify programs, majors, or minors in which the course is to be required or used as an appropriate elective**
This course is not required for any major or minor.

6. Implementation

- a. **List faculty member(s) to whom the course will be assigned initially**
Dr. Conwell, Dr. Andrew, Dr Pakey
- b. **Identify the textbook(s) and supplementary materials to be used, including publication dates**
Universe by Kaufmann (5th edition, 2000)
- c. **Additional costs to students**
There will be no additional costs to students.
- d. **List the term in which the course will first be offered**
Fall 2001

7. Community College Transfer

A community college course may be judged equivalent to this course.

8. Date approved by the department: March 31, 2000

9. Date approved by the college curriculum committee: April 18, 2000

10. Date approved by CAA: October 19, 2000

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PHY1095G -- Principles of Astronomy, Honors

1. Catalog Description

- a. Course level: PHY 1095G
- b. Title: Principles of Astronomy, Honors
- c. Credit: 3-0-3
- d. Term to be offered: S
- e. Short title: Astronomy
- f. Course description: An introduction to the solar system, planets, stars, galaxies, evolution of stars, neutron stars, black holes, cosmology, and the structure of the early universe. Physics 1096G must be taken concurrently.
- g. Prerequisite: Admission to the University Honors Program
- h. The course is writing-active.