

ROWAN COLLEGE
CURRICULUM COMMITTEE

(2)

M I N O R C H A N G E

PROPOSAL TITLE: Add Lab to Astronomy

1 UNDERGRADUATE GRADUATE CREDIT HOURS

SPONSOR(S): E. Flores, P. Farnelli, J. Hettlinger, H. Ling, SC needs

DEPARTMENT & TELEPHONE# Chemistry & Physics 4555

- CHECK ONE:
- CHANGES IN APPROVED MINORS, SPECIALIZATIONS, CONCENTRATIONS
 - CATALOGUE DESCRIPTIONS AND/OR PREREQUISITE CHANGES
 - SMALL CHANGES IN COURSE CONTENT OF EXISTING COURSES WHICH DO NOT SUBSTANTIALLY VARY THE CURRICULUM
 - CHANGES IN HEGIS NUMBER

<p>STEP #1 (DEPARTMENT)</p> <p>APPROVED / DATE: <u>10/17/95</u></p> <p>NOT APPROVED / DATE: _____</p> <p><u>Robert Newland</u> (DEPT. CURRICULUM CHR./ DATE)</p> <p><u>Robert Newland</u> DEPT. CHR/DATE <u>10/17/95</u></p>	<p>STEP #2 (SCHOOL)</p> <p>DATE REVIEWED <u>2/2/96</u></p> <p><input checked="" type="checkbox"/> RECOMMEND TO APPROVE</p> <p><input type="checkbox"/> RECOMMEND NOT TO APPROVE</p> <p>COMMENTS:</p> <p><u>Log Hony</u> SCHOOL CURRICULUM CHR.</p>	<p>STEP #3 (ACADEMIC DEAN)</p> <p><input checked="" type="checkbox"/> RECOMMEND <input type="checkbox"/> NOT RECOMMENDED</p> <p>DATE REVIEWED: <u>2/9/96</u></p> <p><u>Sam DeBartolo</u> DEAN OF SCHOOL SIGNATURE</p>
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<p>STEP #4 (CURRICULUM COMMITTEE)</p> <p>SCC# <u>95-96-116</u></p> <p>DATE RECEIVED: <u>2-15-96</u></p> <p><u>Emilio G. Garcia</u> 3/22/96 CURRICULUM COMMITTEE CHR. SIGNATURE</p>	<p>STEP #5 EXE. VP/PROVOST</p> <p><input checked="" type="checkbox"/> APPROVED note no lab for necessary Newland memo 4/15/96 to Dean Bontal F.</p> <p><input type="checkbox"/> NOT APPROVED</p> <p><u>[Signature]</u> SIGNATURE/DATE</p>
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MINORCHG. FRM
B. Kelsey 5/3/96 for.

B. Kelsey 5/3/96
REGISTRAR SIGNATURE/DATE

MINOR CURRICULAR CHANGE

1. DETAILS

Change: Astronomy 1911.120 from 3 S.H. to 4 S.H. to include a lab experience and be part of the (LAB) bank of courses.

Sponsors: Don Farnelli, Eduardo Flores, Jeff Hettinger, Hong Ling, W. C. Woods, Jr.

2. RATIONALE

Astronomy is a scientifically sound physical science which has been a driving element for the development of modern science. Today, astronomy is still one of the most popular and dynamic sciences. It investigates the evolutionary and structural aspect of stars and galactic systems, enhancing our understanding of the universe.

The sky is a great laboratory, having served to develop and test scientific theories from Newton's laws to General Relativity. Adding a lab component to Astronomy will greatly benefit students since the night sky observational experiences will complement the material presented in class as well as freeing some class time for a more rigorous approach to the class. The lab experience will provide night observation of stars, constellations, nebulae, and galaxies. Students will learn the aspects of both reflecting and refracting telescopes and their application. This requires a qualitative and quantitative understanding of basic optics, elements of spectroscopy, plane geometry and newtonian and modern cosmology which are integral part of both lecture and laboratory experiences.

Here are but a few examples of the laboratory experiences that will follow-up lectures:

'Night Orientation Program'

Students need to know their way around the night sky. It is important to compare "systems" of locating objects. Ex: Terrestrial Coordinates: Latitude and Longitude; Equatorial Coordinates or Right Ascension and Declination; Altitude and Azimuth and the night sky. Night orientation is vital to locating objects on the celestial dome. This is a very important laboratory experience which introduces students to spherical coordinate systems.

"The Equatorial Coordinate System"

Students will make use of the refracting and reflecting telescopes in utilizing the "setting circles" of "right ascension and declination", the fixed coordinates of the celestial sphere. Using this coordinate system they will be able to technically communicate specific locations of stars and other sky objects.

"Methods of Determining Distance to Stars"

The parallax method for determining stellar distances using major axis of the earth's orbit as a base line and plane geometry. They will also use of the inverse square law to determine the absolute brightness of and distance to a star.

"Orbital Motion of the Inferior Planets" (Mercury/Venus)

Students will observe the planets as they appear during the present season. Apparent westward motion (retrograde) can be verified from direct nightly observation. Planetary theory deals specifically with proper and direct motion of the planets. This will afford the students an opportunity to verify planetary motion.

"Seasonal Changes in the Stars"

During any given semester the constellations move westward by 1 arc degree per day. Seasonal constellations appear in the eastern sky and move westward by approximately 30 arc degree per month. Student notice how the sky changes with the season. Specific constellations are identified with the season. Ex: The "Summer Triangle" (Vega in Lyra; Deneb, in Cygnus; Altair, in Aquila); The "Winter Triangle" (Betelgeuse, in Orion; Sirius, in Canis Major; Procyon, in Canis Minor).

"The Diurnal Motion of the Moon"

Students observe the phase changes and changing position of the moon through its "synodic" period. (New Moon to New Moon). The nightly observations of the changing position and phase of the moon will result in the determination of the moon's "proper motion" which is eastward every 29.5 days. This activity is ongoing and takes at least two lunar cycles for completion.

3. CONSULTATIONS:

Kathleen Small, Advisement and Curriculum Elementary Education Department
Approved by the faculty of the Department of Chemistry and Physics

Astronomy 1911.120 (Lecture & Lab) 4 S.H.

Astronomy is a descriptive study of the universe emphasizing the composition and movements of bodies in the solar system. It investigates the evolutionary and structural aspect of stars and galactic systems. This course stresses the fundamental aspects of astronomical theory as it applies to our understanding of the universe. The lab experience provides night observation of stars and constellations, nebulae, galaxies, and daytime solar observation. An integral part of the laboratory experience includes both qualitative and quantitative studies.

ROWAN COLLEGE OF NEW JERSEY

Office of the Dean of the School of Liberal Arts and Sciences

FAX COVER SHEET

Message consists of this page and 1 others

DATE:

4/15/96

TO:

Mary-Beth Krogh-Jespersen

FROM:

Beal Bartel

Office of the Dean of the School of Liberal Arts and Sciences
Bosshart Hall 205
Rowan College of New Jersey
201 Mullica Hill Road
Glassboro, NJ 08028
Telephone: (609) 256-4850 FAX: (609) 256-4921

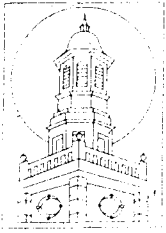


ROWAN

To: Pearl Bartelt
From: Robert Newland, Chairperson
Subject: Astronomy lab
Date: April 15, 1996

I have had time to talk with Dr. Woods and to look more carefully at his list of items the students will use in his lab course and find that some of the items are things that we will purchase once and others should be purchased by the students from the bookstore. Thus there might be a small investment needed to buy those one-time items but the continuing costs can be off loaded to the students as purchases they make as they do their texts. The items the students will purchase are readily available from places like Edmund Scientific and are not dangerous in any way. They are much like the safety goggles we require all students to purchase.

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ROWAN

To: Pearl Bartelt
 From: Robert Newland, Chairperson
 Subject: Astronomy lab
 Date: April 11, 1996

The astronomy course has added a lab experience to it to become a General Education Lab Course. Naturally this means added costs for my Department. We estimate our needs to be about \$20 per student. The course cap is 26 due to space limitations in our rooftop observatory. We will offer five sections of this course in the Fall term. The types of items that must be purchased are star charts, hand-held spectroscopes, student planetaria, galaxy cards, star finders, earth orbit guides and such materials. These are all low cost expendable materials needed for the course. Thus we will need \$520 per section or \$2,600 for the Fall semester. We anticipate offering five more sections in the spring bringing the total need to \$5,200 for the school year.

*No additional
 lab fee
 required
 4/15/96*

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 APR 15 1996

OFFICE OF THE DEAN
 ARTS AND SCIENCES

Policy on Course/Laboratory Fees

Students enrolling in credit bearing courses may be charged a "course or laboratory fee" in addition to tuition when the material or service costs incurred in teaching that course exceed those routine and ordinary.

Criteria for imposition of a course or laboratory fee would satisfy the following conditions respecting utilization of **material**:

1. Materials are expended during the semester; not reusable by other students. Consumption of the materials is directly attributable to those enrolled in the course, and
2. Materials require a special storage environment provided by the department for optimal performance of the material, or
3. Materials are supplied commercially in bulk or in large quantities to the extent that repackaging is impractical or unavailable, or
4. Small/single unit purchases by students would result in substantially higher unit costs.

Criteria for imposition of a course or laboratory fee would satisfy one or more of the following conditions respecting utilization of **services**:

1. Fares for transportation by common carrier, livery or other vehicle to off-campus locations; reservation/admission fees to events or exhibitions; lodging expenses.
2. Access fees charged on a time-use basis (as in data retrieval services) and a minimal usage fee per student is a precondition for service.
3. Costs of providing supervising or technical staff to assist in course activities.