RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

PHYS–120 INTRODUCTION TO ASTRONOMY

I. Basic Course Information

A. Course Number and Title: PHYS-120 Introduction to Astronomy

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall Year: 2025

D. Effective Term: Fall 2026

E. Sponsoring Department: Science & Engineering

F. Semester Credit Hours**:** 3

G. Weekly Contact Hours**:** 3 Lecture**:** 3
Laboratory**:** 0
Out of class student work per week: 6

H. ☒ Prerequisite (s): MATH 020- Elementary Algebra
☐ Corequisite (s):

I. Additional Fees**:** None

II. Catalog Description

Prerequisite: MATH 020 – Elementary Algebra. This is an introductory course in astronomy that tells a scientific story of the universe. It's a journey of knowledge that begins with the perspectives that the ancients had about the cosmos and gradually evolves into our current more sophisticated understandings of it, offered by modern cosmology and one of humanity's grandest theories, the big bang. Topics include the origin and evolution of the solar system, the birth and death of stars, black holes, galaxies, and the structure, properties, and expansion of the universe as a whole. It may be used to fulfill one semester of a science requirement for non-science majors, or as an elective for science majors.

III. Statement of Course Need

A. Astronomy is considered one of the most enjoyable and popular college courses. Introduction to Astronomy (PHYS-120) is the non-lab version of Astronomy (PHYS-130). It may be used as a Free Elective, a General Education course, a non-lab science requirement for non-science majors, or as an elective for science majors who have already taken a number of lab science courses and may now prefer a less time-consuming and financially more feasible non-lab science course.

B. There is no lab component.

C. Introduction to Astronomy is a common offering in most colleges and universities. Hence, this course generally transfers as a general education course in astronomy or science, and/or as a free elective dependent on the transfer institution.

IV. Place of Course in College Curriculum

A. Free Elective
B. This course serves as a General Education course in Science (non-lab).
C. This course meets a program requirement for a non-lab science elective for non-science majors.
D. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites.

V. Outline of Course Content

This course explores the following astronomy themes:

A. Observing the Sky: The Birth of Astronomy
B. Orbits and Gravity
C. Earth Moon and Sky
D. Light and Atoms
E. An Introduction to the Solar System
F. The Origin and Formation of the Solar System
G. The Sun: A Nuclear Powerhouse
H. H-R Diagrams and the Evolution of a One-Solar-Mass Star
I. Life and Death of Massive Stars: Supernova, Neutron Stars, Black Holes
J. Cosmology, Big Bang

VI. A. Course Learning Outcomes:

At the completion of the course, students will be able to:

1. Gain a scientific insight on various astronomical phenomena (GE 3).
2. Conceive logical inferences to conceptual astronomy questions using scientific knowledge from the laws of astronomy (GE 3).
3. Use technology (e.g., a planetarium software or astronomy simulations) to collect and present scientific information (G3, G4).

B. Assessment Instruments

1. Quizzes.
2. Videos with embedded questions.
3. Online (via canvas) asynchronous student discussions on topics in astronomy.
4. Written scientific reports from actual observations (of astronomical phenomena) and/or simulated observations (using a planetarium software or astronomy simulations).
5. Other, as specified by instructor.

VII. Grade Determinants

A. Videos with embedded questions.
B. Completion of required readings.
C. Online student discussions.
D. Frequent quizzes (roughly weekly).
F. Other, as specified by instructor (e.g., scientific reports).

Given the goals and outcomes described above, LIST the primary formats, modes, and methods for teaching and learning that may be used in the course:

A. Lectures (e.g., online, videoed lectures).
B. Online student discussions.
C. Student astronomy activities (e.g., from actual and/or simulated observations).
D. Potential student collaborations (in astronomy activities).
E. Independent study.
F. Other, as specified by instructor.

VIII. Texts and Materials

A. Free online (OpenStax) astronomy textbook.
B. Free astronomy software.

C. Other, as specified by instructor (e.g., free access to the instructor's astronomy website).

(Please Note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.)

IX. Resources

A. RVCC Planetarium
B. RVCC Library
C. RVCC Computer Labs

X. Check One: ☐Honors Course ☒ N/A