# RARITAN VALLEY COMMUNITY COLLEGE
# ACADEMIC COURSE OUTLINE

# PHYS 102 – GENERAL PHYSICS II

## I. Basic Course Information

A. Course Number and Title: PHYS 102 – General Physics II

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall Year: 2020

**D. Effective Term: Fall 2020**

E. Sponsoring Department: Science & Engineering

F. Semester Credit Hours: 4

G. Weekly Contact Hours: 6
Lecture: 3
Laboratory: 3
Out of class student work per week: 7.5

H. Prerequisites: PHYS 101 - General Physics I or equivalent

I. Laboratory Fees: Yes

J. Name and Telephone Number or E-Mail Address of Department Chair and Divisional Dean at time of approval:
Department Chair: Marianne Baricevic marianne.baricevic@raritanval.edu
Divisional Dean: Sarah Imbriglio sarah.imbriglio@raritanval.edu

## II. Catalog Description

Prerequisites: PHYS 101 - General Physics I or equivalent. This is the second semester of a two semester sequence in introductory algebra-based physics, which is required for students majoring in many of the sciences and a variety of other disciplines. Topics include: Simple harmonic motion and elasticity, vibrations and waves, sound, electric and magnetic forces and fields, electric potential, direct current circuits and components, alternating current, electromagnetic waves, geometric and physical optics, and topics in modern physics.

## III. Statement of Course Need

**A.** This is a standard course in any algebra-based physics course sequence.

**B.** This course requires a lab component for students to employ a scientific approach to understanding of the physics principles and concepts, and obtain first-hand experience in observation, data collection, analysis, and research.

**C.** This course generally transfers as a program requirement, general education course in science with lab, and/or free elective.

## IV. Place of Course in College Curriculum

A. Free Elective.

B. This course serves as a General Education course in Science with Lab.

C. This course meets a program requirement for: General Science/Pre-Health Professional and Pre-Medicine and Pre-Pharmacy. This course may also be used as part of a required physics or science sequence for the following programs: Chemistry, Computer Science, Environmental Science, Information Systems & Technology, Mathematics, and Pre-Medicine and Pre-Pharmacy AS.

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 topics:

A. Simple harmonic motion
B. Elasticity
C. Waves and Sound
D. Electric charge
E. Electric forces and fields
F. Electric potential energy and voltage
G. Capacitance
H. Current and resistance
I. DC circuits
J. Magnetic forces and fields
K. Electromagnetic induction

L. Alternating current
M. Electromagnetic waves
N. Geometric optics
O. Physical optics
P. Topics in modern physics

## VI. General Education and Course Learning Outcomes

### A. General Education Learning Outcomes:

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

1. Classify and interpret information (GE-NJ 2, 3).
2. Analyze and solve appropriate physics problems (GE-NJ 2, 3, *).
3. Apply basic laboratory techniques to relevant physics experiments and report on their results (GE-NJ 1, 2, 4, *).
4. Discover information through research and report on their analyses of research information (GE-NJ 1, 3, 4).

(* embedded critical thinking)

### B. Course Learning Outcomes:

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

1. Collect and interpret data accurately.
2. Apply theoretical strategies to the analysis of data.
3. Conceive reasonable inferences in response to observations.
4. Analyze and solve physics problems systematically and logically.
5. Apply mathematical techniques and use appropriate computing tools to obtain quantitative solutions to problems in physics and other disciplines.
6. Synthesize for the purposes of discussion and written work.

### C. Assessment Instruments

1. Laboratory experimentation
2. Problem solving individually and in peer dialogue
3. Analysis of reading assignments
4. Research projects
5. Other, as specified by instructor

## VII. Grade Determinants

A. Discussion questions
B. Homework problems
C. Exams and quizzes
D. Research and/or collaborative projects

E. Oral presentations
F. Laboratory reports
G. Class participation and preparation

The primary formats, modes, and methods for teaching and learning that may be used in the course:

A. Lecture/discussion
B. Laboratory
C. Small group projects
D. Student oral presentations
E. Computer instruction and simulations
F. Independent study

## VIII. Texts and Materials

A. Textbooks
B. Primary sources
C. Journals and publications
D. Web sources
E. Databases
F. Audio/visual sources

Samples of specific texts which may be featured:

- Cutnell/Johnson, *Physics*, Wiley Publishers, (Most Recent Edition).

- Wilson/Hernandez, *Physics Laboratory Experiments*, Houghton-Mifflin Publishers, (Most Recent Edition).

(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. Laboratory
B. Computers
C. Library

**X. Honors Options:** None