

# **RARITAN VALLEY COMMUNITY COLLEGE ACADEMIC COURSE OUTLINE**

## **ENVI 102: Environmental Science and Sustainability**

### **I. Basic Course Information**

A. Course Number and Title: ENVI 102 Environmental Science and Sustainability

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall Year: 2024

**D. Effective Term: Fall 2025**

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. ☐ Prerequisite (s): None

☐ Corequisite (s): None

I. Additional Fees: None

### **II. Catalog Description**

Prerequisites or Corequisite: None

This is an interdisciplinary lecture and laboratory course that uses a scientific approach to analyze the biophysical, social, political, and economic causes and consequences of environmental problems. Students will be encouraged to explore how these concepts and issues relate to their own lives, from both global and local perspectives. Students will study existing solutions and develop concepts and designs for their own potential solutions to common environmental problems documented on campus, at home, or in the surrounding community. Students will gain hands-on experience and build skills in environmental science and research through field work, online databases, group projects inside and outside the classroom, and service learning opportunities. The course will use

campus sustainability as an overarching framework to introduce students to the theory and practice of environmental science. Students cannot receive credit for both ENVI 101 and ENVI 102.

### **III. Statement of Course Need**

- A.** This course serves as an introductory survey course to understanding current environmental issues in the context of sustainability and resilience. Students will analyze the science of environmental issues while also exploring the political, economic, social, cultural, historical, and philosophical dimensions of human impacts on the environment. By focusing on basic aspects of human life (e.g., climate change, air and water pollution, etc.), the course is relevant and meaningful both to students engaged in formal environmental programs of study, as well as the general student body. The causes and consequences of environmental problems will be explored as well as potential solutions at individual and institutional scales.
- B.** Through the laboratory portion of the course, students will employ a scientific approach to understand and address environmental, social, and economic aspects of sustainability in places and landscapes familiar to them, including the RVCC campus, their own homes, and the surrounding community. Using the scientific method, students will develop basic skills in data collection and analysis by measuring indicators of environmental, social, and economic health. This will enable students to understand and apply scientific methodologies related to documenting environmental issues; these types of skills are transferrable to a wide range of fields and professional endeavors. This laboratory will introduce students to the practice of sustainability, including identifying and analyzing suitable indicators of environmental and societal health, exploring existing best practices and developing conceptual frameworks and designs for solutions.
- C.** Please describe the transferability of this course. For example:
  - 1. This course may transfer as a General Education course in Science with Lab.
  - 2. This course may transfer as a program requirement for Environmental Studies and Environmental Science majors dependent on the transfer institution.
  - 3. This course does not generally transfer as a program 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 may be used to meet a program requirement for the Environmental Studies A.A. and Environmental Science A.S. majors.
- D.** To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, [www.njtransfer.org](http://www.njtransfer.org); b) for all other colleges and universities, go to the individual websites

## V. Outline of Course Content

- A. Introduction to Environmental Science and Sustainability
  - a. Defining “sustainability”
  - b. Triple bottom line
  - c. Ecosystem services
  - d. Ecological footprint
  - e. Individual versus institutional contributions to sustainability
- B. Air Pollution
  - a. Air quality and atmospheric science
  - b. History of air pollution and regulation
  - c. Major categories of air pollutants
  - d. Transportation
  - e. Case studies
    - i. Leaded gasoline
    - ii. CFC’s and the ozone layer
- C. Water Pollution
  - a. The water cycle and freshwater scarcity
  - b. Major categories and causes of water pollutants
  - c. Case studies
    - i. Surface and groundwater quality in the US
    - ii. Ocean pollution
- D. Waste and Recycling
  - a. Municipal solid waste management
    - i. Garbage barges and landfills
    - ii. Recycling
    - iii. Incineration
  - b. Hazardous waste management
  - c. Case studies
    - i. E-waste
    - ii. Love Canal
- E. Toxins in Consumer Products and the Built Environment
  - a. Major categories of contaminants
  - b. Risk perception and assessment
  - c. Regulation
- F. Climate Change
  - a. Evidence of human contributions to climate change
  - b. Consequences
  - c. Solutions at multiple scales
- G. Laboratory
  - a. Ecological footprint
  - b. Home audits of waste behavior and water use
  - c. Analysis of environmental impacts of home recycling
  - d. Using online databases to access environmental data on water and air quality, toxins in consumer products, toxic waste sites, etc.
  - e. Service learning projects related to water quality on campus

- f. Field trips on campus and to external organizations to explore best practices

## **VI. A. Course Learning Outcomes:**

Students will:

1. understand ethical issues and situations related to environmental problems (GE-ER)
2. use technological resources to access, analyze, and present scientific data and evidence needed to answer questions about local and/or global environmental quality (GE-4\*, GE-IL)
3. students will apply the scientific method to analyze environmental problems and draw conclusions from data and evidence (GE-3\*)
4. evaluate and think critically about information related to the scientific, governmental, economic, social, and historical dimensions of environmental issues and/or solutions (GE-IL)
5. prepare written reports and/or poster/oral presentations of environmental and sustainability research/practice in a technical format (GE-1)

## **B. Assessment Instruments**

Given the outcomes described above, LIST which of the following assessment methods may be used; please note any instruments that will be **required** to assess outcomes as listed above (e.g., research papers for information literacy):

1. exams
2. laboratory/technical reports
3. presentations
4. homework exercises
5. reading quizzes
6. self and peer evaluations
7. online/computer database assignments

## **VII. Grade Determinants**

The following may be used to determine the final grade:

- A. midterm and final exam
- B. textbook readings and quizzes
- C. homework assignments
- D. presentations
- E. laboratory/technical reports
- F. self and peer evaluations

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. lecture/discussion
- B. small-group work
- C. online database assignments

- D. laboratory and field exercises
- E. field trips
- F. student oral presentations
- G. student collaboration
- H. experiential learning
- I. service learning

### **VIII. Texts and Materials**

The following types of course materials may be used:

- A. suggested textbook: Environmental Studies: From New Jersey to the Globe, by Mark Yuschak and Viveca Sulich (OER textbook: <https://rvcc.pressbooks.pub/envstudies/>)
- B. articles from scientific journals and periodicals
- C. technical reports from colleges, universities, trade associations, governmental agencies, and non-governmental organizations
- D. films and documentaries
- E. internet databases and information sources
- F. laboratory equipment
- G. library article databases

(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 van and/or bus rental
- B. library databases and other library resources
- C. natural areas and built infrastructure on campus, at home, and in the surrounding community
- D. RVCC science laboratories, greenhouse and related supplies
- E. environmental monitoring equipment
- F. computers with internet access, Excel, ArcMAP (GIS), and SAS-JMP statistical software
- G. field guides, literature, films and documentaries from RVCC Library and Science and Engineering department

**X. Check One:** ☐ Honors Course ☐ Honors Options ☒ N/A