

**RARITAN VALLEY COMMUNITY COLLEGE  
ACADEMIC COURSE OUTLINE**

**SCIE - 212H INDEPENDENT RESEARCH IN SCIENCE AND  
ENGINEERING III -HONORS**

**I. Basic Course Information**

A. Course Number and Title: SCIE-212H Independent Research in Science and Engineering III – Honors

B. New or Modified Course: NEW

C. Date of Proposal: Semester: Spring      Year: 2015

D. Sponsoring Department: Science & Engineering

E. Semester Credit Hours: 3

F. Weekly Contact Hours: 3

G. Prerequisites: Minimum GPA of 3.5 or permission of the instructor, SCIE-211H Independent Research in Science and Engineering Honors II, and permission of instructor in Science and Engineering department.

H. Laboratory Fees: Yes

I. Name and Telephone Number or E-Mail Address of Department Chair at time of approval:  
Sarah Imbriglio, sarah.imbriglio@raritanval.edu

**II. Catalog Description**

*Prerequisites: Minimum GPA of 3.5 or permission of the instructor, SCIE-211H Independent Research in Science and Engineering Honors II, and permission of instructor in Science and Engineering department.*

Independent research provides students with an opportunity to engage in scientific research with the guidance of a faculty member. In consultation with and approval of the faculty member, students select a research topic, perform a literature search, design and complete appropriate research. Students will be required to complete a formal paper detailing the research; including the purpose, methods, results and conclusions. Additional culminating experiences, as directed by the instructor, may include an oral presentation, a poster display at a local or regional conference, or submission of a research paper to a journal.

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

The course will be of particular interest to students considering transfer to four-year institutions majoring in science. This course will strengthen student's applications to graduate programs in science by engaging the student in scientific research.

### **IV. Place of Course in College Curriculum**

- A. This course serves as a free elective.
- B. To see course transferability for New Jersey schools, go to the NJ Transfer website, [www.njtransfer.org](http://www.njtransfer.org); for all other colleges and universities, go to the individual websites.

### **V. Outline of Course Content**

- A. Introduction to research.
- B. Literature research techniques.
- C. Introduction to scientific writing.
- D. Oral presentation of scientific research.

## **VI. EDUCATIONAL GOALS AND LEARNING OUTCOMES**

### **A. EDUCATION GOALS**

Students will:

1. Locate, review, interpret and analyze scientific information. (GE-NJ IL)
2. Apply fundamental concepts in engineering and science (GE-NJ 3)
3. Demonstrate the fundamentals of problem solving and critical thinking (GE-NJ 3)
4. Communicate scientific research findings (GE-NJ 1)

### **B. LEARNING OUTCOMES**

Students will be able to:

1. Interpret data accurately (Goal 3).
2. Apply theoretical strategies to the analysis of data (Goal 2).
3. Formulate a scientific problem and appropriate hypotheses (Goal 2, Goal 3).
4. Conduct a literature search on a particular problem or question in the sciences (Goal 1).
5. Design and implement a scientific research project and write a formal research proposal (Goal 4).

## **VII. MODES OF TEACHING AND LEARNING**

Formats, modes, and methods for teaching and learning may be:

- A. lecture/discussion
- B. small group projects
- C. service learning
- D. student oral presentations
- E. student collaboration
- F. independent research

## **VIII. PAPERS, EXAMINATIONS, AND OTHER ASSESSMENT INSTRUMENTS**

Assessment methods may be:

- A. performance of laboratory techniques
- B. presentation of research findings
- C. analysis of reading assignments
- D. other, as specified by instructor

## **IX. GRADE DETERMINANTS**

In order to evaluate achievement of the goals and outcomes listed above, possible grade determinants may be:

- A. Presentations
- B. Discussion questions
- C. Laboratory journal/writing assignments
- D. Research projects

## **X. TEXTS AND MATERIALS**

- A. primary sources
- B. web sources
- C. databases

## **XI. RESOURCES**

Students may need to use library databases and other library resources for critical research assignments and/or computers.