RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

BIOL152– Cancer Biology

I. Basic Course Information

A. Course Number and Title: BIOL152 – Cancer Biology

B. New or Modified Course: New

C. Date of Proposal: Fall 2017

D. Effective Term: Spring 2018

E. Sponsoring Department: Science & Engineering

F. Semester Credit Hours: 3

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

H. Prerequisites/Corequisites: None

I. Laboratory Fees: None

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

II. Catalog Description

There are no prerequisites. In this course, students will examine the concepts of cellular and molecular biology using the uniting theme of cancer. Each unit is contrasted with how alterations of normal cellular function leads to the development of cancer. Cancer awareness, advocacy, and critical thinking activities will develop a sense of civic engagement and appreciation of the social relevance of science through disease.

III. Statement of Course Need

A. This course will offer students an opportunity to apply scientific knowledge to a real-world biomedical issue, the biology of cancer.

B. There is no lab.

C. This course generally transfers as a free elective and it is anticipated to transfer as a non-lab science general education course. (Pending General Education Approval)

IV. Place of Course in College Curriculum

A. Free Elective
B. This course serves as a General Education course in non-lab science. (Pending General Education Approval)
C. 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

Science concept	Civic or Social Issue
Introduction to cellular and molecular biology	Introduction to cancer statistics and malfunction of organisms at the cellular and molecular level leading to pathology
Macromolecules [carbohydrates, protein, lipids, nucleic acids]	Nutritional aspects of cancer, role of diet, obesity, and heredity in relationship to cancer risk
Cellular components	Cellular changes common to cancer cell morphology and characteristics
Cellular membranes; Fluid mosaic model	Alteration of cell adhesion and integral proteins in cancer cells
Central dogma: DNA→RNA→Protein	Gene mutations and repair in cancer Changes in gene expression [mRNA and protein] in cancer
Cellular signaling and communication Reception, transduction and cell response	Abnormalities in cell signaling leading to cancer progression Alterations in receptor location, structure, abundance and function Changes in protein effectors and transduction pathways Abnormal cellular response in cancer cells

Virus structure, reproduction and function	Viral role in cancer; HPV, HIV, HTLV, HHV risk and mechanisms of action leading to cellular progression to cancer phenotypes
Eukaryotic genes and gene expression	Proto-oncogenes and tumor suppressors role in cancer progression
Cellular respiration and fermentation	Decrease in the rate of oxidative phosphorylation in cancer cells with corresponding increase in fermentation Role of angiogenesis and increased blood supply to tumors in cancer progression

VI. General Education and Course Learning Outcomes

A. General Education Learning Outcomes:

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

1. Identify and critically evaluate sources of scientific information. (GE-NJ IL, *)
2. Discuss the ethical implications of being scientifically responsible, and think critically about the influence of science on society (GE-NJ ER*).
3. Use the scientific method to evaluate a problem and generate conclusions. (GE-NJ 3).
4. Compose oral and written reports on a scientific topic using research methods (GE-NJ 1,) (* embedded critical thinking)

B. Course Learning Outcomes:

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

1. Explain how cancer cells differ from non-cancer cells
2. Assess the benefits and dangers of medical advances as they affect daily lives
3. Discuss molecular and cellular biology.

C. Assessment Instruments

1. Research papers
2. Quizzes
3. Essays
4. Discussions
5. Presentations
6. Activities using the scientific method

VII. Grade Determinants

A. Research papers
B. Quizzes
C. Essays
D. Discussions
E. Presentations
F. Service Learning Project

Primary formats, modes, and methods for teaching and learning that may be used in the course:
A. lecture/discussion
B. small-group work
C. guest speakers
D. student oral presentations
E student collaboration
F. independent projects
G. interviews/surveys

VIII. Texts and Materials

A. primary sources
B. interviews
C. film and video
D. web sources
E. other computer-based sources
F. community resources

(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. Computer with internet and research capabilities

X. Honors Options: No honors option