



Science, Technology, Engineering and  
Mathematics 3322 College Drive,  
Vineland, NJ 08360  
856-691-8600

## **BI 221: Cell and Molecular Biology**

Syllabus

Lecture/Lab/Credits: 3/3/4

### **Catalog Description**

*Prerequisite: Minimum grade of "C" in BI 102 – General Biology II or BI 107 – Anatomy and Physiology II*

This course will provide students a background in contemporary biochemical, cell and molecular and biotechnology techniques currently utilized in biological science laboratories. Lectures will focus on the subcellular distribution and function of macromolecules, regulation of gene expression, recombinant DNA technology, gene therapy techniques and the molecular basis of cell signaling and cancer. Emphasis will be placed on developing fundamental student laboratory skills utilizing recombinant DNA technology and other current techniques of cell and molecular biology.

### **Textbook and Course Materials**

It is the responsibility of the student to confirm with the bookstore and/or their instructor the textbook, handbook, and any other materials required for their specific course and section.

Click here to see current textbook prices at <https://cccnj.bncollege.com/shop/cc/home>.

### **Evaluation Assessment**

#### **Online Proctoring**

All courses offered at RCSJ, whether they are web-enhanced, hybrid, or fully online, may include assessments that make use of Online Proctoring. To find out more about Online Proctoring, and to learn about the minimum technical requirements, visit [rcsj.edu/elearning/online-proctoring](https://rcsj.edu/elearning/online-proctoring).

### **Grading Distribution**

Grading to be determined by individual instructors.

Individual instructors may include the following assessment(s):

- Exams
- Quizzes
- Class Discussions
- Written Assignments
- Attendance and Participation

### **Grading**

The grading scale for each course and section will be determined by the instructor and distributed the first day of class.

## Rowan College of South Jersey Core Competencies

(Based on the NJCCC General Education Foundation - August 15, 2007; Revised 2011; Adopted 2014)

This comprehensive list reflects the core competencies that are essential for all RCSJ graduates; however, each program varies regarding competencies required for a specific degree. Critical thinking is embedded in all courses, while teamwork and personal skills are embedded in many courses.

1. **Written and Oral Communication:** Students will communicate effectively in both speech and writing.
2. **Quantitative Knowledge and Skills:** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems
3. **Scientific Knowledge and Reasoning:** Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.
4. **Technological Competency:** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals
5. **Society and Human Behavior:** Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.
6. **Humanistic Perspective:** Students will analyze works in the fields of art, history, music, or theater; literature; philosophy and/or religious studies; and/or will gain competence in the use of a foreign language
7. **Historical Perspective:** Students will understand historical events and movements in World, Western, non-Western or American societies and assess their subsequent significance.
8. **Global and Cultural Awareness:** Students will understand the importance of a global perspective and culturally diverse peoples.
9. **Ethical Reasoning and Action:** Students will understand ethical issues and situations.
10. **Information Literacy:** Students will address an information need by locating, evaluating, and effectively using information.

### BI 221 Core Competencies

This course focuses on two of RCSJ's Core Competencies:

- Written and Oral Communication
- Scientific Knowledge and Reasoning

## Student Learning Outcomes: Cell and Molecular Biology

Successful completion of BI 221 will help students:	RCSJ Core Competencies	Evaluation / Assessment (Additional means of evaluation may be included by individual instructors)
Describe the major structure and function of DNA, RNA and proteins within a cell.	- Scientific Knowledge and Reasoning	- Laboratory Techniques Written Laboratories - Knowledge of Molecular Characteristics -Tests
Work in lab groups following procedures and analyzing data together to form sound scientific conclusions.	- Scientific Knowledge and Reasoning	- Participation Written Laboratories
Design and execute effective searches for information through online assignments and WebQuests.	- Scientific Knowledge and Reasoning	- Online Assignments - In Class Assignments
Prepare a formal laboratory report describing their laboratory data generated during their laboratory sessions.	-Written and Oral Communication	- Written Laboratory Report -Report Rubric
Analyze laboratory data and solve problem-based learning case studies.	-Scientific Knowledge and Reasoning	- Tests -Case Studies
Gain an understanding of the many techniques utilized in biochemical and cell biology research.	- Scientific Knowledge and Reasoning	- Tests -Written Laboratories

## Topical Outline

### Lecture

The basis of cell structure and the structure and function of proteins, DNA and chromosomes will be discussed. Emphasis will be placed on the structure of DNA as it relates to replication, repair and recombination.

The regulation of transcription and translation in both prokaryotes and eukaryotes will be discussed with emphasis placed on laboratory techniques such as DNA cloning and manipulation will be discussed.

The structure of the plasma membrane and its use in both intercellular and intracellular transport will be discussed.

The use of the plasma membrane and the cytoskeleton in cell communication and cell division will be discussed. The molecular regulation of cell division and errors in cell division will also be covered.

### Lab

Protein Purification

Isolation of DNA from your cells

Polymerase Chain Reaction

Analysis of Your PCR Reactions Isolation and Analysis of Proteins from Cells

ELISA

Cell Transformation

Cell Structure and Communication

Capstone Lab: Restriction Digests

Analysis of Common Mutations in Cancer Cells

## **Affirmative Action Statement**

The Board of Trustees is committed to providing a work and academic environment that maintains and promotes affirmative action and equal opportunity for all employees and students without discrimination on the basis of certain enumerated and protected categories. These categories are race, creed (religion), color, national origin, nationality, ancestry, age, sex (including pregnancy and sexual harassment), marital status, domestic partnership or civil union status, affectional or sexual orientation, gender identity or expression, atypical hereditary cellular or blood trait, genetic information, liability for military service, or mental or physical disability, including AIDS and HIV related illnesses.

For questions concerning discrimination, contact Almarie J. Jones, Special Assistant to the President, Diversity and Equity/Title IX and Compliance, 856-415-2154 or [ajones@rcsj.edu](mailto:ajones@rcsj.edu) or (Cumberland) Nathaniel Alridge, Jr., JD, Director, Diversity and Equity/Title IX and Judicial Affairs, 856-691-8600, ext. 1414 or [nalridge@rcsj.edu](mailto:nalridge@rcsj.edu). For disability issues or any barriers in the learning or physical environment related to a document condition/disability please contact: Gloucester campus – Carol Weinhardt, Director, Department of Special Services, ADA/504 Officer at 856-415-2247 or [cweinhar@rcsj.edu](mailto:cweinhar@rcsj.edu); or Cumberland Campus – Meredith Vicente, Senior Director, Department of Special Services/Project Assist at 856-200-4688 or [mvicent1@rcsj.edu](mailto:mvicent1@rcsj.edu)

## **Department of Special Services**

The Department of Special Services is committed to providing support services and ensuring equal access to eligible students with documented conditions/disabilities as outlined by the Americans with Disabilities Act (ADA) and the Americans with Disabilities Act with Amendments Act (ADAAA).

### **(Gloucester Campus Location and Contact)**

Location: Instructional Center, room 425A.

Primary Contact: Director, Carol Weinhardt, (email) [cweinhar@rcsj.edu](mailto:cweinhar@rcsj.edu); or (phone) 856-415-2247.

### **(Cumberland Campus Location and Contact)**

Location: Center for Academic & Student Success (CASS)

Primary Contact: Senior Director, Meredith Vicente, (email) [mvicent1@rcsj.edu](mailto:mvicent1@rcsj.edu); or (phone) 856-200-4688.

## Reporting Allegations of Sexual Assault Resource Referrals (8/2021) Cumberland Campus

There are multiple safe places for students to report allegations of sexual assault, both on and off campus. Reports of sexual assault can be made to any of the following offices listed in the chart below.

All students are encouraged to report alleged crimes on campus.

Employees must report crimes that pose an immediate threat to the campus Security Office, the local Police Department or the Sheriff's Office.

Service	Resource	Phone Number/Location/Website
<p><b>Non-Confidential</b> Reporting</p> <p>Law Enforcement</p>	<p>Vineland Police Dept. Millville Police Department Cumberland Co. Sheriff's Office Cumberland County Emergency Services Cumberland Campus Security 856-200-4706 (Direct)</p>	<p>856-691-4111 856-825-7010 856-451-4449 <b>9-1-1</b></p> <p>Andres Lopez, Director Safety and Security 856-200-4706</p>
<p><b>Non-Confidential</b></p> <p>On-Campus Reporting Support Services</p>	<p>Almarie J. Jones Special Assistant to the President Diversity and Equity, Title IX and Compliance Nathaniel Alridge, Jr., JD, Director Diversity and Equity, Title IX and Judicial Affairs</p> <p>Kellie W. Slade Executive Director Student Services, Student Life</p>	<p>856-415-2154 Gloucester Campus College Center, Room 116 <a href="mailto:ajones@rcsj.edu">ajones@rcsj.edu</a> 856-498-9948 Catherine J. Arpino Education and Humanities Center, <a href="mailto:nalridge@rcsj.edu">nalridge@rcsj.edu</a></p> <p>856-200-4615 Student &amp; Enrollment Services Center <a href="mailto:kslade@rcsj.edu">kslade@rcsj.edu</a></p>
<p><b>Confidential</b> On-Campus Counseling and Support Services</p>	<p>Student Counseling and Wellness Center John Wojtowicz, LCSW</p>	<p>Academic Building – 1<sup>st</sup> floor 856-200-4760 <a href="mailto:jwojtowi@rcsj.edu">jwojtowi@rcsj.edu</a></p>
<p><b>Confidential</b> Off-Campus Full-Service Support</p>	<p>Center for Family Services – Services Empowering Rights of Victims (SERV)</p>	<p>24/7 Hotlines Cumberland Co. – 1-800-225-0196 <a href="http://www.centerffs.org/serv">www.centerffs.org/serv</a></p>
<p><b>Hospital</b> Sexual Assault Nurse Examiner on Site</p>	<p>Inspira Medical Center Vineland</p>	<p>1505 W. Sherman Ave., Vineland, NJ 856-641-8000</p>