



Chesapeake Bay Governor's School  
*For Marine and Environmental Science*  
**Warsaw Campus**

## **Biology ~ 2014-2015**

### **Instructor Information:**

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### **Course Description (RCC BIO 101/102):**

The biology course taught to the Chesapeake Bay Governor's School **sophomores** focuses on those major concepts deemed to be essential to an understanding of life processes. Throughout the year, science as a process will be emphasized as students conduct laboratory investigations to support classroom information, use inductive reasoning skills to discover key concepts, study the history of the development of our present understanding of biological concepts, and learn how to conduct their own research. The major themes emphasized throughout the course are genetics, evolution, energy transfer, the relationship between structure and function, ecological interrelationships, the regulation of processes at many levels, and the impact of science and technology on society. These concepts are all encompassing as well as recurring in all topics that will be covered throughout the year. This course, in conjunction with the Foundations course, will adequately prepare our students to succeed in their next two years at CBGS, in college, and in their future endeavors, as they will learn to focus their efforts and master essential study skills. CBGS Biology students will also be able to succeed on the Virginia Standards of Learning End of Course Biology Exam.

### **Text:**

**Biology: The Unity and Diversity of Life**; Cecie Starr and Ralph Taggart; Thomson: Brooks/Cole; 2006

*Please handle the textbook with care, their age is showing.*

**Course Credit:** 4 credits per semester, including lab.

**Required Materials:** At least one 3-ring binder with dividers, paper, colored pencils, glue stick, graph paper, pens and pencils, highlighters, calculator, USB flash drive

**Recommended Materials:** Clear plastic sleeves to keep handouts in 3-ring binder

**Attendance:** Class attendance is, of course, required. Be reminded of the CBGS policy in the *Handbook* which you signed. Absences and tardies will be reported daily to your home school and to parents on interims and grade reports. Check for assignments you may miss by accessing the web site ([www.cbgs.k12.va.us](http://www.cbgs.k12.va.us), Courses link, Warsaw site link, and Biology link. You may also email or call me for assistance.

***Learning Sequence:***

**Unit   Topics**

**Labs/Assignments**

1: The Science of Biology

- |                                                |                          |
|------------------------------------------------|--------------------------|
| ○ Safety                                       | Chapter 1                |
| ○ Scientific Method, Graphing                  | Experimental Design Lab  |
| ○ Measurements, SI units, Dimensional Analysis |                          |
| ○ Levels of Organization                       | Dichotomous Key Activity |
| ○ Scientific Literature                        | Journal Reading          |
|                                                | Scientific Writing       |

2: Cellular Biology

- |                               |                           |
|-------------------------------|---------------------------|
| ○ Atoms, Bonding              | Chapters 2-5              |
| ○ Biochemistry                | Macromolecule Inquiry Lab |
| ○ Water                       | Water Activity            |
| ○ Cell Structure and Function | Microscope Labs           |
| ○ Cell Membranes, Transport   | Diffusion and Osmosis Lab |
|                               | Protist Competition       |

3: Energetics

- |                      |                         |
|----------------------|-------------------------|
| ○ Enzymes            | Chapters 6-8            |
| ○ How cells make ATP | Enzyme Lab              |
| ○ Photosynthesis     | Photosynthesis Lab      |
| ○ Respiration        | Respiration Lab         |
|                      | Pictograph: Respiration |

4: Heredity

- |                                    |                                  |
|------------------------------------|----------------------------------|
| ○ Cell Cycle, Mitosis, and Meiosis | Chapters 9-16, selected readings |
| ○ Mendelian Genetics               | Mitosis Internet Activity        |
| ○ DNA and Protein Synthesis        | Pictograph: Protein Synthesis    |
| ○ Biotechnology                    | Gel Electrophoresis Lab          |
|                                    | Blood Typing Lab                 |
|                                    | Genetic Disease presentations    |

## 5: Plant Biology

- Tissues
- Nutrition and Transport
- Reproduction
- Growth and Development

Chapters 29-32, selected readings  
Flower Dissection Lab

## 6: Evolution and Biodiversity

- Genetic Basis for Evolution
- Natural Selection
- Population Evolution
- Classification
- Overview: Prokaryotes through Vertebrates

Chapters 17-28, selected readings  
Population Genetics and Evolution  
Hardy – Weinberg Activity  
Dissections, a systems approach

## 7: Animal Physiology

- Human Anatomy
- Physiological processes

Chapters 33-44, selected readings  
Physical Fitness Activity

## 8: Ecology

- Population Biology
- Behavior and Habitat Selection
- Energy Flow
- Biogeochemical cycles
- Ecosystems, biomes, biosphere

Chapters 45-48, selected readings  
Predator Prey Activity

**Make-up work policy:** If you miss a class, you are responsible for discovering what work you missed. It needs to be completed and turned in within two days of your return to class. Tests and quizzes missed will be taken on the date of return to class as they are scheduled well in advance.

**Missing work:** 10% of the total points a day will be deducted from all work not turned in on the due date. Zeroes averaged into any component of your marking period average can have devastating effects, so be sure to turn something in!

**Honor Code:** Students are expected to follow the rules and procedures as outlined in the Student Honor Code. Please refer to the Student Handbook if you need guidelines. Failure to do so may result in dismissal from the course. Tests, quizzes, and other work as requested will be pledged.

### ***Course Expectations and Information:***

1. **RESPECT!** yourself, others in the room, the room and all equipment and materials, everyone we deal with, the environment.....!
2. **SAFETY!** Be aware of yourself and your surroundings in all lab situations. Follow all safety rules and **always read lab directions**.
3. **Class Participation:** You will get the most out of this class if you come prepared each day and **participate** in the discussions and other activities.
4. **Reading Assignments:** Reading a science text is not like reading a novel! Read the textbook **prior** to the class discussion of the topic. Answer any assigned questions prior to the discussion. Write down any questions you have and ask them in class. Some reading assignments will be on the internet.
5. **Note Taking:** You will need a notebook for the notes you will take in class as well as the notes you *should* take as you read each chapter. It is wise to learn now how to take detailed notes during class discussions. **Note Making:** You will need to stop periodically to review and rewrite your notes (at least at the end of each chapter). Summarizing your notes in this way is an excellent way to study, and, if you do it nightly, it will point out questions you need to ask the next day in class.
6. **Free Writing:** Frequently you will be asked to write your thoughts and questions about a topic from your reading assignment. You will be expected to write continuously (for 3-5 minutes) whatever comes into your head about the concept. This writing will be the starting point for many class discussions.
7. **Lab Work:** Lab work is an integral part of biology. We will do several of the required AP Biology labs plus other labs throughout the year that are designed to give you a better understanding of the experimental work of biologists. In these labs you will investigate a question or relationship, collect and analyze data, interpret the results, and draw conclusions. You will write at least one formal lab report each quarter that will include an introduction, an explanation of the methods, data tables and graphs, and a discussion of the results. You will be expected to type these reports. All lab papers and reports must be kept in your 3-ring binder.
8. **Pictographs, Competitions, and Presentations:** Several times during the year you will be asked to turn on your right brain and create a pictograph, participate in a competition, or develop a presentation to represent a complex biological process or explain a biological topic or concept. Studies indicate that the more learning modalities students use to process material, the better they will understand and

remember it. Hopefully by turning on your creative processes you will come to a better understanding of certain biological processes, topics, or concepts.

9. **Evaluation:** Formal evaluations (i.e. tests!) will be multiple choice and free response. Multiple Choice items will come from old AP Tests among other sources so that you will constantly be challenged to use that grey matter. The free response section can be problems, short answers, graphs with data analysis, and/or essays. These will all involve critical thinking skills to prepare you for future scientific endeavors. Evaluations will usually occur at the end of each unit. Quizzes will be given as topic and homework checks.
10. **Grading:** Lab/Activity work: 30%, Evaluations: 50%, Field trip and class participation: 10%, Classwork/Homework: 10%. We are on a 10 point grade scale (90% and above is an A for example).
11. **Classwork and Homework.** In the upper right hand corner of the page indicate your name, the date, the page (if more than one page), and the assignment you are doing. Homework is due at the beginning of the period on the due date. Classwork is due when the teacher asks for it. Please keep these pages in chronological order to facilitate classwork or homework checks in class. These assignments may also be collected from time to time.
12. **Tips on how to survive this and other college level courses:**
  - ❖ Keep up to date/ahead of schedule. It is too easy to get bogged down otherwise. We do *not* meet every day!
  - ❖ Realize that you will have to work/read on weekends and holidays. You should spend at least 30 minutes a night on Biology related work. Lab analysis will require more time.
  - ❖ You may have to stay late, come early, form a study group, ask for help.
  - ❖ Ask questions in class—even if they seem *stooooo*pid!
  - ❖ **Get organized!** Get a 3-ring binder and lots of dividers!
  - ❖ Sharpen your critical reading, note taking, and essay writing skills.
  - ❖ Rely heavily on your text reading for “details”—it is impossible for me to cover every detail in class. Read the photo blurbs! Process the graphs and illustrations!
  - ❖ Schedule your time and use it effectively!
  - ❖ Find a “study buddy”—just make sure that you actually use the time to study, not fool around. Your buddy may also help out if you are absent and need to make up work.
  - ❖ You need to be self-motivated in college!

### ***Policies:***

**Cell Phone/Electronics Policy:** All cell phones and other electronic devices must be silenced and are not to be used during class, unless permission is given otherwise. Phones and electronics are tools; they must be used for the teacher described function. If used in an unauthorized manner, electronics will be confiscated and returned at the end of the class period.

### **Inclement Weather and School Closings Policy:**

- Closing of the Chesapeake Bay Governor's School is determined by the site: Glenss or Warsaw or Bowling Green. For example: Essex County Schools may be closed due to weather but RCC-Warsaw is open; therefore CBGS will be open.
- If a school system is closed due to inclement weather and CBGS is open, students from the closed school system may attend pending the safety of the roads and permission from the parents.
- There may be an emergency in which CBGS is closed and the particular school system is open. Students shall report to their respective school instead of going to CBGS.
- If there is a one-hour delay for the CBGS site, CBGS will open one hour late.
- If there is a two-hour delay for the CBGS site, CBGS will be closed and students are to report to their home high school.
- If the home high school opens one hour late, and CBGS opens on time, students from the home high school are to report to CBGS one hour late.

### **CBGS Statement on Safety:**

What to know and do to be prepared for emergencies at CBGS/RCC:

- Sign up to receive RCC text messaging alerts and keep your information up-to-date. <https://alert.rappahannock.edu/index.php?CCheck=1>
- Know the safe evacuation route from each of your classrooms. Emergency evacuation routes are posted in campus classrooms.
- Listen for and follow instruction from CBGS/RCC or other designated authorities.
- Know where to go for additional emergency information.
- Report suspicious activities and objects.

### **Statement on Americans with Disabilities Act:**

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 require schools to provide an 'academic adjustment' and/or a 'reasonable accommodation' to any qualified individual with a physical or mental disability who self-identifies as having such. Students should contact CBGS faculty for appropriate academic adjustments or accommodations.