**General Biology**

**Fall Semester 2019**

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*Chattahoochee High - “A community dedicated to learning and committed to excellence”*

**Textbook:** Miller, Kenneth R., and Joseph S. Levine. *Biology*. Boston, Massachusetts: Pearson, 2019. ISBN:978032895124 Replacement Cost: $103.97

**Textbook Online Resources**: Information will be provided during class.

**Course Description:** The Biology curriculum continues students’ investigations of the life sciences that began in Grades K-8. The course is designed to provide students with the necessary knowledge and skills to become literate, knowledgeable, and proficient in biology. Biology extends the life sciences to more abstract concepts including: interdependence of organisms; the relationship between matter, energy, and organisms; the behavior of organisms; and evolution. These concepts are investigated through laboratory experiences and fieldwork designed for students to develop appropriate knowledge and skills in science as inquiry.

This course will include the Georgia Milestones End of Course Test (GMEOC) for Biology. The GMEOC will serve as the Spring Final Exam, which is 20% of the 2nd semester grade. The GMEOC is a cumulative exam that covers the entire Biology curriculum and is administered in the spring as required by the State Board of Education. All students are required to take the GMEOC in order to receive credit for the course. The GMEOC will be administered dates will be communicated at a later time.

**Outcome:**

At the end of this course students should be able to:

1. Use appropriate scientific tools to observe, record, organize, analyze, interpret, write, and present the results of scientific investigations clearly and accurately.
2. Relate the importance of the chemistry of life to cellular structures and functions in both prokaryotic and eukaryotic cells.
3. Describe and explain the role of DNA and RNA in transfer of traits to successive generations under both asexual and sexual situations.
4. Explain the evolutionary basis of modern classification.
5. Trace the history of the theory of evolution and evaluate the role of natural selection in the development of the theory.
6. Relate the complexity of organisms to how they obtain, transform, transport, release, and eliminate matter and energy.
7. Investigate and assess the interdependence between organisms and the flow of matter within their ecosystems.

**Units and Objectives**

The following is a projected outline of this semester's units of study. Changes may be made at the discretion of the teacher to best address the needs of the class. *Objectives are taken from the Georgia Standards of Excellence (GSE) for Science.*

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| **Unit**  | **Topic**  | **Duration**  |
| **0**  | **Introduction to Biology, Lab Safety and Science Skills (Chapter 1)**    | *~ 1.5 weeks*  |
| **1**  | **Ecology**  **SB5. Obtain, evaluate, and communicate information to assess the interdependence of all organisms on one another and their environment.**   | *~6 weeks*  |

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|  | 1. Plan and carry out investigations and analyze data to support explanations about factors affecting biodiversity and populations in ecosystems. (*Clarification statement*: Factors include population size, carrying capacity, response to limiting factors, and keystone species.)
2. Develop and use models to analyze the cycling of matter and flow of energy within ecosystems through the processes of photosynthesis and respiration.
	* Arranging components of a food web according to energy flow.
	* Comparing the quantity of energy in the steps of an energy pyramid.
	* Explaining the need for cycling of major biochemical elements (C, O, N, P, and H).
3. Construct an argument to predict the impact of environmental change on the stability of an ecosystem.
4. Design a solution to reduce the impact of a human activity on the environment. (*Clarification statement*: Human activities may include chemical use, natural resources consumption, introduction of non-native species, greenhouse gas production.)
5. Construct explanations that predict an organism’s ability to survive within changing environmental limits (e.g., temperature, pH, drought, fire).

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| **2**           **3**  |  **Biochemistry** **SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.** c. Construct arguments supported by evidence to relate the structure of macromolecules (carbohydrates, proteins, lipids, and nucleic acids) to their interactions in carrying out cellular processes. (*Clarification statement*: The function of proteins as enzymes is limited to a conceptual understanding.)    **Cellular Structure & Cellular Energy** **SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.**  1. Construct an explanation of how cell structures and organelles (including nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, Golgi, endoplasmic reticulum, vacuoles, ribosomes, and mitochondria) interact as a system to maintain homeostasis.
2. Develop and use models to explain the role of cellular reproduction (including binary fission, mitosis, and meiosis) in maintaining genetic continuity.
3. Plan and carry out investigations to determine the role of cellular transport (e.g., active, passive, and osmosis) in maintaining homeostasis.
4. Ask questions to investigate and provide explanations about the roles of photosynthesis and respiration in the cycling of matter and flow of energy within the cell (e.g., single-celled alga).

(*Clarification statement*: Instruction should focus on understanding the inputs, outputs, and functions of photosynthesis and respiration and the functions of the major subprocesses of each including glycolysis, Krebs cycle, electron transport chain, light reactions, and Calvin cycle.)   | *~2.0 weeks*           *~ 5 weeks*  |
| **4**  | **Mendelian Genetics, Molecular Genetics & Biotechnology** **SB2. Obtain, evaluate, and communicate information to analyze how genetic information is expressed in cells.** 1. Construct an explanation of how the structures of DNA and RNA lead to the expression of information within the cell via the processes of replication, transcription, and translation.
2. Construct an argument based on evidence to support the claim that inheritable genetic variations may result from:
	* new genetic combinations through meiosis (crossing over, nondisjunction);
	* non-lethal errors occurring during replication (insertions, deletions, substitutions); and/or
	* heritable mutations caused by environmental factors (radiation, chemicals, and viruses).
3. Ask questions to gather and communicate information about the use and ethical considerations of biotechnology in forensics, medicine, and agriculture. (*Clarification statement*: The element is intended to include advancements in technology relating to economics and society such as advancements may include Genetically Modified Organisms.)

 \*This unit will be continued into spring semester and some standards may not be covered until then.  | *~ 2.5 weeks*  |

**Grade Determination: Grade Scale for Fulton Co.:**

Summative *(Tests)* 40% A= 100-90

Formative *(Quizzes)* 10% B= 89-80

Progress Reporting *(Lab Work)* 20% C= 89-80

Homework\* 10% F= below 70 Final Exam 20%

*\*This also includes any class work collected or work started during class but finished at home.*

**Explanation of Grade Components:**

1. **Tests and Quizzes:** Tests will include information from class notes, textbook, labs, handouts, homework, etc. Tests are announced well in advance. Therefore, *students should ideally be able take a test even if they are absent the day before the test is given*.
2. **Labs:** Lab activities will be performed approximately once a week. You will be responsible for performing the lab in class and completing the necessary lab report. A lab assessment will be given based on the labs done in class. Students who miss a lab should consult their teacher for a make-up time.

*It is the student's responsibility to PROMPTLY initiate lab make-ups*.

*Lab safety is of utmost importance*. Therefore, students are expected to follow laboratory safety rules as outlined in the Safety Contract provided. Failure to adhere to lab safety rules will result in a warning, private detention, dismissal from lab &/or referral to the appropriate administrator.

1. **Homework:** Homework will be assigned and graded regularly throughout the semester. Often, homework will consist of reading selected sections from the textbook, journal articles, etc. Each student is expected to keep up with all of his or her homework assignments. Full credit will not be given for late assignments.
2. **Cumulative Final Exam and EOCT:** There will be a cumulative final exam given at the end of the first semester and GMEOC test in May.

**Policies, Procedures & Additional Information**

**Make-up Policy:** Make-up tests, quizzes, and labs are to be scheduled individually with the instructor outside of classroom hours or via email. Students will have **one** week to make up tests, quizzes, or labs upon return. Students will have one day for each day absent to make up work. Assignments made prior to a full day of absence and due on the day of the absence will be due upon the student's return to school. Late make up work will not be accepted.

**Late Work Policy:** Any late assignment can be turned in at a later day for 50% credit. Students *will not be granted permission to retrieve assignments left in their lockers.*

**Extra Help:** Help is available **most** **mornings** **at 7:45 a.m.** and in the afternoon by appointment. Students are welcomed to drop-in unannounced but my availability cannot be guaranteed. Help sessions will be provided prior to each test. There will be no extra credit projects and the lowest test grade will NOT be dropped, so students are strongly encouraged to ask for additional help as needed.

**Tardies**: Students are expected to be in their assigned seat and working when the tardy bell rings. Students are expected to take care of all personal matters such as restroom breaks, personal grooming, water fountain stops, lockers trips, etc. before coming to class.

**Recovery Policy**

**School Board Policy IHA Grading and Reporting System** Provision for Improving Grades

1. Opportunities designed to allow students to recover from a low or failing cumulative grade will be allowed when all work required to date has been completed and the student has demonstrated a legitimate effort to meet all course requirements including attendance. Students should contact the teacher concerning recovery opportunities. Teachers are expected to establish a reasonable time period for recovery work to be completed during the semester. All recovery work must be directly related to course objectives and must be completed ten school days prior to the end of the semester.
2. Teachers will determine when and how students with extenuating circumstances may improve their grades.

**Chattahoochee High School Science Department Provision for Improving Grades**

1. Students who complete a major assessment but fail to demonstrate mastery as evidenced by a grade below 75% on the major assessment may pursue an improvement opportunity to show proficiency. In the case of an honor code violation on a major assessment, the grade will stand as a zero with no eligibility for recovery on that assignment. What is classified as a major assessment is determined within the content area; consult your course syllabus for details.
2. Students should contact the teacher concerning recovery opportunities within 5 school days of being informed of the grade on the assessment in class. Students are allowed one attempt at recovery per major assessment category listed in the course syllabus. All recovery work must be completed 10 days before the end of the semester.
3. The grade on the recovery assignment will replace the original grade if the recovery grade is equal to or below 75%. If the recovery grade is above 75%, the original grade will be replaced with a 75%.

**CHATTAHOOCHEE HIGH SCHOOL GUIDELINES:**

**Honor Code Violations**: *Plagiarism and cheating are NOT tolerated under any circumstances and will result in an honor code violation and zero credit for the assignment*. I will complete an honor code violation form which "may be used by the faculty in making future recommendations, specifically memberships in honor clubs." Cheating is defined as: Any sharing of information in a *non-collaborative* situation (i.e. tests, quizzes, labs, homework, etc.) regarding a graded assignment. Plagiarism includes copying of another student's work, using excessive editing suggestions from another person, or using words or ideas from a published source without proper documentation.

**Expectations for Written Work Across the Curriculum** All written work should:

* + Be in complete sentences using formal language
	+ Follow conventions of grammar, usage and mechanics
	+ Accurately cite sources used with discipline-specific requirements (i.e. MLA, APA, etc.).

**Technology Code of Ethics**: According to the Fulton County Schools policy "students shall not alter or attempt to alter school or private property including technology hardware and software." This includes: a) changing desktop settings or control panels b) removing or damaging mouses, keys, cables, connectors, network jacks, or any other hardware c) modifying computer software d) damaging device parts

**Textbook Policy**: Each student will be issued a textbook and they are responsible for its care and replacement, if needed. Textbooks may not be left in classrooms and *teachers are not responsible for the whereabouts of students' books*. The copy which was issued must be turned in at the end of the course. Students will not receive credit for turning in another student’s book and may not turn in replacement books. The cost of replacement will be assessed to any student who fails to turn in the book they were issued or who turns in a damaged book. Additionally, any textbook turned in without the Fulton County bar code sticker on the inside cover of the book will result in a fine.

**Classroom Expectations:**

Everyone has the right to learn in a safe and productive environment. No one has the right to disrupt another person's learning. Therefore, students are expected to adhere to the following at all times, in addition to the school rules.

1. **Be respectful**: Listen while others are speaking, raise your hand, treat the belonging of others with care, and follow directions.
2. **Be Prepared**: Bring ALL required materials and be ready to learn when the bell rings. Non-essential items should be put away during class (including food and drinks!).
3. **Electronic devices (phones, airpods etc.) are strictly prohibited in the classroom.** Electronic devices should be turned off & out of sight. These items may be confiscated if used during class.
4. **Show me your eyes**. This means keep your head off your desk.
5. **Leave the room as you found it** **and please recycle!**

Failure to follow any of the class rules may result in the following negative consequences: 1) warning and reminder of rule, 2) private detention &/or contact with parent(s), 3) public detention & parental contact, 4) referral to the appropriate administrator.

*The teacher reserves the right to set policy and rules for other issues which may arise during the course of the semester which were not specifically addressed in this syllabus.*

*Thank you for reading! I look forward to a wonderful year!!*