Cosby High School

Biology I Syllabus

Part 1: Course Information

Instructor Information

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Course Description

The goal of Biology I is to equip students with a foundational set of understanding of molecules and organisms, heredity, evolution, and ecosystems that will benefit them throughout their high school career and postsecondary journey. Biology I will help students to gain a deeper understanding of life and will help students cultivate an appreciation of life. To accomplish this goal, we will incorporate science and engineering practices and crosscutting concepts into every day skills and learning. Collaboration and individual effort will be required.

Students will be expected to work hard during class and outside of class. Meaning, while most work will be completed during class time, some work and effort will need to be completed at home. Students should take full advantage of their school educational time and should work to manage their time efficiently outside of school. This is a required course to graduate, therefore learning the concepts are not only beneficial (and fun), but necessary.

Students who struggle with science should be prepared to spend additional time outside of class completing the course requirements and learning the concepts. Please reach out to me, so I can best help you. **I am always here to help, all you have to do is ask.**

General Education/High School Pathway Area

- This is one of the three required science courses for graduation.

Textbook & Course Materials

Required Text

- McGraw-Hill Education Tennessee Glencoe Biology (provided)

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Part 2: Student Learning Outcomes

Students should pay close attention to the deadlines on google classroom. Under each topic on google classroom will be the readings, slides, resources, activities, assignments and assessments.

LS1: From Molecules to Organisms: Structures and Processes
addresses how individual organisms are configured and how these structures function to support life, growth, behavior, and reproduction. The first core idea hinges on the unifying principle that cells are the basic unit of life.
LS1.A: Structure and Function
LS1.B: Growth and Development of Organisms
LS1.C: Organization for Matter and Energy Flow in Organisms
LS1.D: Information Processing

LS2: Ecosystems: Interactions, Energy, and Dynamics
explores organisms' interactions with each other and their physical environment. This includes how organisms obtain resources, how they change their environment, how changing environmental factors affect organisms and ecosystems, how social interactions and group behavior play out within and between species, and how these factors all combine to determine ecosystem functioning.
LS2.A: Interdependent Relationships in Ecosystems
LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
LS2.C: Ecosystem Dynamics, Functioning, and Resilience
LS2.D: Social Interactions and Group Behavior

LS3: Heredity: Inheritance and Variation of Traits
across generations, focuses on the flow of genetic information between generations. This idea explains the mechanisms of genetic inheritance and describes the environmental and genetic causes of gene mutation and the alteration of gene expression.
LS3.A: Inheritance of Traits
LS3.B: Variation of Traits

LS4: Biological Evolution: Unity and Diversity
explores "changes in the traits of populations of organisms over time" [1] and the factors that account for species' unity and diversity alike.
LS4.A: Evidence of Common Ancestry and Diversity
LS4.B: Natural Selection
LS4.C: Adaptation
LS4.D: Biodiversity and Humans

BIO1.LS1: From Molecules to Organisms: Structures and Processes

1. Compare and contrast existing models, identify patterns, and use structural and functional evidence to analyze the **characteristics of life**. Engage in argument about the designation of **viruses as non- living** based on these characteristics.
2. Evaluate comparative models of various **cell types** with a focus on organic molecules that make up **cellular structures**.
3. Integrate evidence to develop a **structural model of a DNA** molecule. Using the model, develop and communicate an explanation for how DNA serves as a template for **self-replication and encodes biological information.**
4. Demonstrate how **DNA sequence** information is decoded through **transcriptional and translational** processes within the cell in order to synthesize proteins. Examine the relationship of structure and function of various types of **RNA** and the importance of this relationship in these processes.
5. Research examples that demonstrate the functional variety of **proteins** and construct an argument based on evidence for the importance of the molecular structure to its function. Plan and carry out a controlled investigation to test prediction about factors which should cause an effect on the structure and function of a **protein**.
6. Create a model for the major events of the eukaryotic cell cycle, including **mitosis**. Compare and contrast the **rates of cell division** in various eukaryotic cell types in multicellular organisms.
7. Utilize a model of a cell plasma membrane to compare the various types of **cellular transport** and test predictions about the **movement of molecules** into or out of a cell based on the homeostasis of energy and matter in cells.
8. Create a model of **photosynthesis** demonstrating the net flow of matter and energy into a cell. Use the model to explain **energy transfer** from light energy into stored chemical energy in the product.
9. Create a model of **aerobic respiration** demonstrating flow of matter and **energy** out of a cell. Use the model to explain **energy transfer mechanisms**. Compare aerobic respiration to alternative processes of glucose metabolism.

BIO1.LS2: Ecosystems: Interactions, Energy, and Dynamics

1. Analyze *mathematical* and /or computational representations of **population data** that support explanations of **factors that affect population size and carrying capacities** of populations within an ecosystem. Examine a representative ecosystem and based on interdependent relationships present, **predict population size effects** due to a given disturbance.
2. Create a model tracking carbon atoms between inorganic and organic molecules in an ecosystem. Explain **human impacts on climate** based on this model.
3. Analyze through research the **cycling of matter** in our biosphere and explain how **biogeochemical cycles** are critical for ecosystem function.
4. Analyze data demonstrating the decrease in biomass observed in each successive trophic levels. Construct an explanation considering the laws of conservation of energy and

matter and represent this phenomenon in a *mathematical model* to describe the **transfer of energy and matter between trophic levels.**

5. Analyze examples of **ecological succession**, identifying and explaining the order of events responsible for the formation of a new ecosystem in response to extreme fluctuations in environmental conditions or catastrophic events.

BIO1.LS3: Heredity

1. Model chromosome progression through **meiosis and fertilization** in order to argue how the process of **sexual reproduction leads to** both genetic **similarities and variation in diploid** organisms. Compare and contrast the processes of **sexual and asexual reproduction**, identifying the **advantages and disadvantages** of each.
2. Explain how **protein formation results in phenotypic variation** and discuss how changes in DNA can lead to **somatic or germline mutations**.
3. Through **pedigree** analysis, identify **patterns of trait inheritance to predict** family member genotypes. Use mathematical thinking to predict the likelihood of various types of trait transmission.

BIO1.LS4: Biological Change: Unity and Diversity

1. Evaluate scientific data collected from analysis of **molecular sequences, fossil records, biogeography, and embryology**. Identify chronological **patterns of change** and communicate that biological **evolution is supported by multiple lines of empirical evidence** that identify **similarities inherited from a common ancestor**.
2. Using a model that demonstrates the change in allele frequencies resulting in evolution of a population over many generations, identify causative agents of change.
3. **Identify ecosystem services** and assess **the role of biodiversity** in support of these services. Analyze the **role human activities** have on disruption of these services.

BIO1.ETS2: Links Among Engineering, Technology, Science, and Society

1. Obtain, evaluate, and communicate information on how **molecular biotechnology** may be used in a variety of fields.
2. Investigate means by which **karyotypes are utilized in diagnostic medicine**.
3. Analyze **scientific and ethical arguments** to support the pros and cons of applications of a **specific biotechnology technique** such as stem cell usage, in vitro fertilization, or genetically modified organisms.

Curricular Competencies

Each block will challenge students to think critically. Science is a body of knowledge consisting of theories that explain data. Science is also a set of practices that use analysis and argumentation to establish, extend, and refine knowledge. Biology is split into 4 Life Sciences Units. Each block is aligned with the TN Department of Education's standards and approaches to instruction which include Science and Engineering Practices and Crosscutting Concepts.

Science and Engineering Practices (SEPs)

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out controlled investigations
4. Analyzing and interpreting data
5. Using mathematics and computations thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Crosscutting Concepts (CCCs)

1. Pattern
2. Cause & Effect
3. Scale, Proportion, & Quantity
4. Systems & System Models
5. Energy & Matter
6. Structure & Function
7. Stability & Change

Life Sciences

- Unit 1: From molecules to organisms: Structures and processes
- Unit 2: Heredity: Inheritance and variation of traits
- Unit 3: Biological evolution: Unity and diversity Earth and Space Sciences
- Unit 4: Ecosystems: Interactions, energy, and dynamics

For more information on TDOE Science Documents please see the following links.

- Tennessee Academic Standards for Science
- TN Science Standards Implementation Guide
- TN Science Standards Reference

You will meet the objectives listed above through a combination of the following activities in this course:

- Attending class lecture
- Completing class activities
- Participating in class discussion

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Part 3: Grading Policy

Late Work Policy

Be sure to pay close attention to deadlines—there will be no make up assignments or quizzes, or late work accepted without a serious and compelling reason and instructor approval.

Viewing Grades in ASPEN

Points you receive for graded activities will be posted to the ASPEN Grade Book. Click on the My Grades link on the left navigation to view your points.

Your instructor will update the online grades each week. You will see a visual indication of new grades posted on your ASPEN home page under the link to this course.

Assessments and Exams

Students are permitted to use their notes and provided readings during some assessments. Student's mastery of course material will be assessed through scheduled exams. There will be one state wide cumulative exam, the EOC. Assessments and exams will count as 60% of the student grade.

Tennessee Uniform Grading Policy

Local school systems shall use the following uniform grading system for students enrolled in grades nine through twelve (9-12). Students' grades shall be reported for the purposes of application for post-secondary financial assistance administered by the Tennessee Student Assistance Corporation using the uniform grading system.

Grade	How Much You Have Learned	Percent Range
A	Mastery	93 – 100
B	Proficiency	85 – 92
C	Progressing towards expectations	75 – 84
D	Not demonstrating understanding or lack of effort	70 – 74
F	Concepts not learned, failing work	0 – 69

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Part 4: Course Policies

Attendance

Attendance is not only required, but also necessary to ensure the paced learning of every student. It is understandable for absences to occur for various reasons from doctor's appointments to family emergencies; however, when a student is absent, they are responsible for the material covered in the class and related assignments. Students should request their work via email or written request handed to the instructor immediately before or after their absence.

Collaboration

Students must be willing to share their thoughts, opinions, and questions. Most class blocks have a discussion component and all students are expected to participate. Students must learn the value of different perspectives and work together to increase knowledge. Students must model thoughtful conversation. Additionally, participation in class activities will periodically be taken and noted in ASPEN.

Critical Thinking

Students of all ability levels will be asked to perform on high levels. Students will be challenged to grow in their thinking. Students should be open to thinking critically and use their insights to move the conversation forward and to ask questions.

Email

Email or a private message on google classroom is the best way to contact me regarding classroom questions. Please plan ahead and ask questions early so that instructors may respond in a timely manner. Updated parent/guardian contact information should be provided to the instructor.

Inquiry

Many of the questions asked as students learn and discuss concepts are centered around investigations. Students must advocate for their own learning by making inquiry a daily habit, as every good scientist does.

Innovation

As students learn and discuss, they should embrace the creation of new ideas, original thoughts, and unexplored possibilities. Students should be aware of their own biases and work to broaden their perspectives. When completing assignments and working in groups, students are encouraged to be innovative, look at the world around them, ask questions, discover problems, and develop solutions.

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Grade Posting

Official grades are located in ASPEN. Grades are routinely updated in ASPEN and can be viewed by students and parents. Parents should be aware that notifications can be set up through ASPEN. Report Cards will be issued twice a semester – 9th and 18th weeks. Progress reports will be issued twice a semester – 4½ and 13½ weeks.

Late Work

Each assignment completion date will be posted on google classroom. No late submission will be accepted for credit, unless a written agreement has been signed by the instructor on a new completion date. For late assignment agreements, up to 5 points may be deducted for every late day. Students must keep up with their assignments as this will help prepare for exams and may be a part of the student's notebook. There *will not* be an opportunity to submit late work at the end of the course.

Build Rapport

If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. As you will find, building rapport and effective relationships are key to becoming an effective professional. Make sure that you are proactive in informing your instructor when difficulties arise during the semester so that they can help you find a solution.

Makeup Work

If students are absent for any reason—excused or unexcused—students are responsible for making contact with their instructor. Please send an email or meet with the instructor as soon as you know that you will be missing class. Any assignment or project that is due on the day a student is absent is due the day the student returns to school. All makeup work of an excused absence, according to CCBOE's attendance policy, must be submitted within **three days** of the missed class unless otherwise specified by the instructor. Missed assessments and exams must be made up. If you have any questions, please see me for help.

Extra Credit

Extra credit will NOT be extended to individual students. On occasion, extra credit will be given to the entire class, so every student will have the same opportunity to earn extra credit.

Professionalism

Students should be on time and ready to learn every day. Students should be prepared to learn with all assigned readings and materials completed *before* class. Students should release themselves from any distractions *before* they come to class. When addressing peers, school leadership, classroom guests, or instructors, students should speak with respect, patience, and consideration.

Complete Assignments

Assignments must be submitted by the given deadline or special permission must be requested from instructor *before the due date*. Extensions will not be given beyond the next assignment except under extreme circumstances. All assignments must be completed by the assignment due date and time. Late or missing assignments will affect the student's grade.

Incomplete Policy

Under emergency/special circumstances, students may petition for an incomplete grade. An incomplete will only be assigned if the student provides adequate reasoning and a written agreement is signed by the teacher and student. All incomplete course assignments must be completed within the signed agreed upon time.

Academic Dishonesty Policy

1. Academic dishonesty includes such things as cheating, inventing false information or citations, plagiarism and helping someone else commit an act of academic dishonesty. It usually involves an attempt by a student to show possession of a level of knowledge or skill that he/she does not possess.

2. Course instructors have the initial responsibility for detecting and dealing with academic dishonesty. Instructors who believe that an act of academic dishonesty has occurred are obligated to discuss the matter with the student(s) involved. Instructors should possess reasonable evidence of academic dishonesty. However, if circumstances prevent consultation with student(s), instructors may take whatever action (subject to student appeal) they deem appropriate.

3. Instructors who are convinced by the evidence that a student is guilty of academic dishonesty shall assign an appropriate academic penalty. If the instructors believe that the academic dishonesty reflects on the student's academic performance or the academic integrity in a course, the student's grade should be adversely affected. Suggested guidelines for appropriate actions are: an oral reprimand in cases where there is reasonable doubt that the student knew his/her action constituted academic dishonesty; a failing grade on the particular paper, project or examination where the act of dishonesty was unpremeditated, or where there were significant mitigating circumstances; a failing grade in the course where the dishonesty was premeditated or planned. The instructors will file incident reports with the Principal or their designees. These reports shall include a description of the alleged incident of academic dishonesty, any relevant documentation, and any recommendations for action that he/she deems appropriate.

Student Testing Code of Ethics and Security

It is important for you as a student to know that the following guidelines are to be strictly followed. This year the TNReady EOC test will count at least 15% of your final semester grade. Your work on this test is very important and it deserves your best effort.
I understand that during testing on the days of the assessment, I am responsible for:

- Not having any electronic devices on me or in my purse/backpack/pockets
    - Including but not limited to cell phones, smart phones, smart watches, etc. **during testing or during breaks.**
    - Best practice is for students to leave devices at home or in their lockers on the day of testing.
    - If I am caught with a device during testing or during breaks, my test may be nullified, resulting in a zero as at least 15% of my semester grade, and any school level disciplinary action as deemed appropriate by the administration.
- Trying my best on the test
    - If I do not attempt to test (I give **no answers or randomly answer** questions) my test score may be nullified, resulting in a zero as at least 15% of my semester grade, and any school level disciplinary action as deemed appropriate by the administration.
    - The testing administrators and proctors in the testing environment will determine if no answers or random answering is taking place.
    - I will focus and put forth effort on the test .
- Being honest and not cheating
    - If I am caught cheating (taking pictures of the test, writing down and passing answers, talking to other students, looking on other computers, using software outside the testing platform), my test may be nullified, resulting in a zero as at least 15% of my semester grade, and any school level disciplinary action as deemed appropriate by the administration.

Important Note: Any form of academic dishonesty, including cheating and plagiarism, may be reported to the office of student affairs.

Course policies are subject to change. It is the student's responsibility to check for corrections or updates to the syllabus. Any changes will be posted in the classroom