**Advance Placement Biology - SCI 04301 and 04302,**

INSTRUCTOR INFORMATION

Dr. Jeff Smith – Emeritus Director of Academic Affairs

Office- Elliott B009C

Contact – please contact me at [jsmith4@bsu.edu](mailto:jsmith4@bsu.edu) as I do not have an office phone.

Office hours – 2:00 MWF and by arrangement such as before or after class. Zoom office hours available by request.

COURSE MEETING INFORMATION

9:00 MWF (lecture) and 8:00 –9:50 R (lab)

We will meet most of our classes in B211

COURSE OVERVIEW

Ap Biology is an introductory college-level course. Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes, energy and communication, genetics, information transfer, ecology and interactions.

PREREQUISITES

Students should have successfully completed high school courses in biology and chemistry as well as Algebra I.

However, the most important pre-requisite for this course is the student taking enough TIME to keep up with the work. The usual ratio is one hour of outside work for each hour of class.

TEXTBOOKS

Campbell, Biology in Focus, 3rd Edition. Urry, Cain, Wasserman, Minorsky and Orr. 2020. Pearson Education Inc.

ELECTRONIC RESOURCES

1. Canvas – all course materials and handouts will be placed in Canvas. Students are responsible for checking frequently and submitting assignments as described.
2. AP Classroom – this College Board site will be used for Progress Checks, Tutorials and other information related to AP Biology.

AP BIOLOGY FRAMEWORK AND CONTENT

The course framework includes two essential components:

1. Science Practices – The science practices are central to the study and practice of biology. Students should develop and apply the described practices on a regular basis over the span of the course.
2. Course content – The course content is organized into commonly taught units of study that provide a suggested sequence for the course. These units comprise the content and skills colleges and universities typically expect students to master to qualify for college credit and/or placement. This content is grounded in big ideas, which are crosscutting concepts that build conceptual understanding and spiral throughout the course.

Based on the Understanding by Design (Wiggins and McTighe) model, this course framework provides a clear and detailed description of the course requirements necessary for student success. The framework species what students must know, be able to do, and understand, with a focus on the big ideas that encompass core principles, theories, and processes of the discipline.

**The Big Ideas:**

**Big Idea 1: Evolution (EVO)** - The process of evolution drives the diversity and unity of life.

**Big Idea 2**: **Energetics (ENE)** - Biological systems utilize fee energy and molecular building blocks to grow, to

reproduce and to maintain dynamic homeostasis.

**Big Idea 3**: **Information Storage and Transmission (IST) -** Living systems store, retrieve, transmit and

respond to information essential to life processes.

**Big Idea 4**: **Systems Interactions (SYI) -** Biological systems interact and these systems and their interactions

possess complex properties.

INVESTIGATIVE LABORATORY COMPONENT

The course is structured around inquiry in the lab and the use of six science practices. Students will be given the opportunity to engage in student-directed laboratory investigations throughout the course of a minimum of 25% of instructional time. Students will conduct a minimum of eight inquiry-based investigations (two per big idea) throughout the course. The science practices or skills are:

1. Concept Explanation – explain biological concepts, processes and models presented in written format
2. Visual Representations – analyze visual representations of biological concepts and processes.
3. Questions and Methods – determine scientific questions and methods.
4. Representing and Describing Data – represent and describe data.
5. Statistical Tests and Data Analysis – perform statistical test and mathematical calculations to analyze and interpret data.
6. Argumentation – develop and justify scientific arguments using evidence.

**Students will be required to maintain a portfolio of their lab activities on a flash drive or other storage device to take with them to college. This will provide “evidence” to the college of the student’s laboratory experience.**

UNITS OF INSTRUCTION

The course content has been divided into eight instructional units over the two semesters. Five units will be presented in the fall semester and three in the spring. This should allow some time for review for the national exam in May, 2023. The Four Big Ideas will be interwoven within the units.

The units are:

1. Chemistry of Life
2. Cell Structure and Function
3. Cellular Energetics
4. Cell Communication and Cell Cycle
5. Heredity
6. Gene Expression and Regulation
7. Natural Selection
8. Ecology

INSTRUCTOR’S CONCEPTUAL FRAMEWORK FOR BIOLOGY

The instructor’s conceptual framework for understanding Biology is well illustrated by a quote from Theodosius Dobzhansky (1973): “**Nothing in Biology makes sense except in the light of Evolution”**

This conceptual framework will manifest in questions such as:

What is the adaptive value of \_\_\_\_\_\_\_\_\_?

Why has \_\_\_\_\_\_\_\_\_\_\_\_\_ persisted over time?

What is the role of the environment in \_\_\_\_\_\_\_\_\_\_\_\_\_? If the environment changes, what might happen over

time?

Does \_\_\_\_\_\_\_\_ improve the ability of the organism to survive and reproduce? How?

The instructor will try to illuminate you with the “light of evolution” each and every class period. This may sound strange now, but it will make all kinds of sense very quickly.

SUGGESTED NOTE-TAKING METHODS

An *Understanding by Design* format has been used to develop the class presentations and handouts. The instructor will provide a handout for each chapter covered in class. The handout will give the objectives for the chapter. The outline has been used to build a PowerPoint presentation. The information on the PowerPoint slides are in a bulleted format and do not represent the entire coverage of the topic. The PowerPoint slides should be viewed as a “framework” for the content. Additional information will be given orally by the instructor to “flesh out” the framework or will be developed through classroom discussions. Students should recognize that content will be presented in three levels:

Level 1 – must know items – this material will definitely be on the homework and tests

Level 2 – nice to know items – these are background or connecting information and may be on the homework

and tests.

Level 3 – for your information only items – this material will not be on the homework or tests, but can be used

by students as examples to illustrate other topics. Science News items or other current events

will fall into this category.

*Students should focus on:*

1. Knowing the Level 1 items for each chapter or unit.

2. Add notes to the PowerPoint slides based on the instructor’s oral presentation which will identify the “levels”

of the bullet points on the slides.

3. Students should be able to construct their own study guides by converting the PowerPoint slides to an outline

text format and adding in the relevant orally presented information.

HOMEWORK

A selection of short answer questions will be assigned for each chapter. Questions will be divided into two categories, **Knowledge** and **Understanding**. Questions related to **Knowledge** will be given completion points. Questions related to **Understanding** will be graded. Students should focus on the **task words** (shown in bold font text) in the questions such as **discuss**, **justify and** **explain**, **justify** etc. when answering these questions. These same bold font task words will be used in essay questions on exams.

Questions related to **Understanding** will require students to reflect, think, speculate and apply or transfer their knowledge. The answers for these questions will NOT be found in the textbook, and will in fact, be very similar to the type of questions used in AP Biology exams. In some cases, a definitive answer is not the point of the question, but rather that the student state and justify their ideas supported by their evidence or reasoning. Students should not focus on what is the “right answer” on these types of questions.

MAKE-UP WORK

All work is expected by the class period of the due date. Work will be accepted within 24 hours without penalty. Work submitted after 24 hours without prior arrangements will be penalized 5% each day.

**If something happens and you know you will be late with an assignment, please contact the instructor to make arrangements. It is also usually better to submit incomplete work on time than be very late with complete work.**

ACADEMIC HONESTY

The course will follow the expectations for academic honesty as described in the student handbook. Any work submitted is automatically assumed to be the sole work of the student. Exceptions should have citations. If in doubt about work submission and the need to use citations please consult with the instructor.

ATTENDANCE

Students are expected to be on time for all class periods. Students that are 3-5 minutes late will be marked as tardy. Students who arrive after 5 minutes will be marked as absent. Students whose class schedule requires late arrival should notify the instructor.

LAPTOP USE

1. If you use a laptop in class, please boot up your computer as soon as you arrive so that you will be ready to go to work as soon as class starts.
2. You may not read or send e-mail, play music or games, participate in chat rooms.
3. You are encouraged to take notes using your laptop, but you also need to be prepared to use pen and paper as drawings are part of the curriculum in this course.
4. You are responsible for maintaining your computer. Please make sure your computer is working before coming to class. If your computer is not working or is not able to connect to the wireless server, you should follow the help instructions in your laptop management document.
5. The Internet is a wonderful source of information when used properly. When using sources from the Internet, you must evaluate the credibility of the information. All materials found on the Internet must be properly documented like any other source of information to avoid plagiarism which is a form of Academic Dishonesty. If you are unsure how to cite this information, please see Dr. Smith.
6. Remember to save your work frequently. Loss of a file by accident is not an acceptable excuse.
7. Close your lid/screen half way when requested by Dr. Smith.
8. Do not hide toolbars. Keep all items you are working on visible on the screen and available for inspection.

TESTS IN AP BIOLOGY

We are "in training" for the national AP Biology exam, which will be given at 8:00 on the morning of Wednesday May 10, 2023. All students are EXPECTED to take the national exam. Therefore:

**The tests used in the course will attempt to reflect the style and difficulty level of the actual AP Biology exam.**

At least four tests will be given each semester. Each test will consist of a 30 or more multiple-choice questions. The essay exam will consist of 1-2 long essays and 2-3 short essays. Each exam is expected to take one hour for both parts and will be administered in the two-hour lab block. Keys and grading standards will be made available after each exam.

ASSESSMENT

Since the purpose of the AP Biology course is to prepare for the national exam, calculation of grades will be predominantly based on exam performance. Course grades will be based on the following items and percentages:

Multiple Choice Exam - 35%

Essay Exam - 35%

Homework and Projects - 15%

Labs - 15%

100%

Letter grades will be determined on a curve that is based on previous student performance in this class on the national AP Biology exam. The anticipated letter grade breakpoints will be:

A > 80%

B+ = 75-80%

B = 65-75%

B- = 60-65%

C = 55-60%

C- = 50-55%

D\* or failing = <50%

**Note** – The actual letter grade breakpoints used for permanent grades (the semester grades) may be

slightly curved at the discretion of the instructor. I do not curve individual assignments or tests. Extra

credit opportunities will be rarely available. I expect to have your best work the first time on each and

every grading opportunity.

DIVERSITY AND INCLUSION POLICY

Ball State University aspires to be a university that attracts and retains a diverse faculty, staff, and student body. We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse as expressed in our Beneficence Pledge and through university resources found at <http://cms.bsu.edu/campuslife/multiculturalcenter> . As such, it is important to ensure that your comments and behavior in class is respectful and inclusive. Discriminatory comments or behavior will not be tolerated and may result in disciplinary action, in accordance with Indiana Academy and Ball State University policy.

**The most important thing for students in AP Biology is to advocate your needs! I cannot help you if I don’t know what you need. NEVER hesitate to ask questions or seek help!!**