

## **Bio101x: Ramp Up for AP Biology**

Interested in taking AP Biology, or an advanced biology course, but unsure if you are ready? This course is for you!

This short course will briefly review basic concepts covered in AP Biology, and will include advanced challenge questions. Starting with a review of genetics and related content, the course will prepare you to tackle Investigation 2 and 3 of the AP Biology curriculum. You will learn how to create a mathematical model of populations and be able to compare DNA and Protein sequences using BLAST.

We are excited to take this journey with you!

### **Prerequisites**

There are no prerequisites for this course. Knowledge of high school biology and chemistry is useful but not required.

### **Course Overview**

We have divided the course into topic areas related to two AP Biology Investigations.

By the end of the Ramp Up Course you will be able to:

- Define the conditions necessary for Hardy-Weinberg equilibrium
- Explain how mathematical approaches are used to calculate changes in allele frequency
- Create a representation of the genetic makeup of a simulated population over time to determine the impact of selection
- Apply a mathematical approach to analyze the allele frequency data collected from a population to determine if significant change is happening over time
- Create a mathematical model to simulate a population using Excel or Google Sheets.
- Explain the basics of gene expression
- Describe the field of bioinformatics
- Construct and interpret phylogenetic trees and cladograms based on observable characteristics or molecular evidence
- Use BLAST to compare genetic sequences of different organisms

This course is self-paced so you can work through all the material at whatever pace fits you best. Each AP Investigation topic area is about 5-8 hours of student effort. To successfully complete the course and earn a certificate, you need to complete the practice problems and the assignments by the course end date and receive a passing score. The course ends on August 31<sup>st</sup>, 2015 at 11:00 UTC time. Each topic area will include some review questions of prior biology knowledge, interactive video sequences covering the core content of the investigation, practice problems and more challenging assignments that are more like AP Biology questions.

### **Textbook**

A textbook is not required. We suggest using the Open Stax Biology textbook as supplemental reading.

### **Discussion Forum**

We encourage students to actively participate in the discussion forum. You should use the discussion forum to ask questions about concepts from videos, practice problems, and assignments but should not directly discuss answers to assignments on the forum. Remember that you sign an honor code to enroll in this course. Posting answers to practice problems or assignments will forfeit your certificate.

The course staff moderates the forum through the end of August, but we encourage students to answer other students' questions. After August 31<sup>st</sup>, the course will remain accessible to you but will not be actively monitored by staff and you will not be able to earn a certificate for work completed.

### **Grading**

Practice problems are 50% of the total grade. Assignments are 50% of the total grade. You need a total score of 75% or above for a passing score in Bio101x. Certificate will be issued for all those who achieve a passing score at the end of the course.