

# Biology (BIO) 1A Syllabus

# **Course Name**

BIO 1A

Biology I – Semester A

### **Course Information**

BIO 1A is the first semester of this two-semester course.

Welcome to Biology! This semester focuses on the cell and how what happens at the cellular level affects the organisms, which then can have an effect on a population of that organism. There are different types of cells, so you'll compare some of these, including animal vs plant cells, body vs sex cells, and so on. You'll look at the molecules that are fundamental to cell structure and processes. You'll learn about these cell structures and processes, and you'll dive into genetics, a field that depends on understanding how cells work.

# **Course Delivery Method**

Online

# **Contacting Your Instructor**

You may contact your instructor through the Blackboard messaging system. Technical support is available 24/7 at <u>www.k12.ttu.edu</u>.

### **Course Objectives**

After completing this course, you should be able to:

- 1. identify and explain the different levels of organization;
- 2. explain cell structures and processes and how they influence growth of individuals and genetic variation in populations;
- 3. design an experiment with an understanding of the scientific method;
- 4. list biomolecules and explain their functions;

- 5. explain how DNA and proteins are created;
- 6. explain mutations and how they are both prevented and introduced in DNA;
- 7. explain the difference between DNA and RNA
- 8. describe what nucleotides are give examples with their functions;
- 9. explain osmosis as a part of cell transport;
- 10. explain how natural selection works and how genetic variation is achieved; and
- 11. identify and explain adaptations.

BIO addresses the required Texas Essential Knowledge and Skills (TEKS). These can be found at the <u>Texas Education Agency</u> website.

### **Textbook and Materials**

#### Textbook

There is no required textbook for this course.

#### Materials

- camera
- household lab materials (see list in the **Resources** section of the course)
- <u>Benedict's Solution</u> (also available on <u>Amazon</u>)
- test tubes (at least 4)
- pipet or eye dropper (a medicine dropper)
- hot plate (makes it easier to heat items in Pyrex and make observations)
- thermometer
- large Pyrex measuring cup (Pyrex is a durable glass that endures heat better than regular glass, and it is suitable for lab settings.)

# **Technical Requirements**

- Internet access preferably high speed (for accessing Blackboard)
- Email
- Word processing software such as Microsoft Word
- Adobe Reader (download from <u>Adobe.com</u>)
- Audio and video capabilities (for watching/listening to course content)
- PDF app (free options available)

# **Technical Skill Requirements**

Be comfortable with the following:

- using a word processor
- Internet search engines and browsers

 creating PDFs (see Requirements for Creating PDFs in the Syllabus section of your course)

You will submit some other assignments in PDF format. If you have multiple pages, those pages will need to be **saved as one file** before uploading. For example, you may have decided to scan hand-written lab notes along with some typewritten notes. All of these pieces may be saved in a single PDF file.

# **Course Organization**

This course consists of nine lessons, a midterm exam, and a final exam. Each lesson contains the following:

- Objectives
- Lessons with text and video instruction as well as self-checks that count toward your grade.
- Labs and practice problems to upload and receive teacher feedback. A few units also have Discussion boards where you can share ideas with your peers.
- Unit Assessments. Most units have both an uploaded and proctored exam component for the unit's summative assessment.

# **Course Outline**

Please note that some assignments will be hidden from you when you start the course. As you move through the lessons and complete assignments, more will unlock for you.

Unit	Торіс	Approximate Time for Completion
Unit 1	How Scientists Work1.5 weeks	
Unit 2	Biomolecules 2 weeks	
Unit 3	Cell Anatomy 1 week	
Unit 4	Cell Transport and Homeostasis 1.5 weeks	
Unit 5	DNA 1 week	
Midterm	Midterm Exam	
Unit 6	Protein Synthesis 2 weeks	
Unit 7	Mutations and Adaptations 1 week	
Unit 8	Genetics 2 weeks	
Unit 9	Cell Cycle Mitosis 1 week	

Unit	Торіс	Approximate Time for Completion
Final Project		1 week
Final Exam	Final Exam Studying and Taking the Exam	1 week

# Assignment Schedule

Each of the following must be completed to complete the course. Items with an asterisk (\*) indicate that these are summative assessments for the course.

Unit	Weeks	Assignments
Unit 1	1-2	Checkpoint 1 (Non-graded) 1.1 How Scientists Work 1.2: Lab - Red Cabbage Assignment 1.3.1 Paper Towel Lab Orientation 1.3.2 Lab - Paper Towel Absorbency 1.5.1 Scavenger Hunt Preparation 1.5.2 Scavenger Hunt *Unit 1 Summative Assessment: Design Your Own Experiment
Unit 2	2-4	<ul> <li>2.1.1 Levels of Organization</li> <li>2.1.2 Levels of Organization Chart Upload</li> <li>2.2 Biomolecules</li> <li>2.3 Discussion Board - What's Happening?</li> <li>2.4 Lab: Sourcing Sugars</li> </ul>
Unit 3	4-5	<ul> <li>3.1 Anatomy of Cells</li> <li>3.2 Lab - Cell City Model</li> <li>3.3 Discussion Board - Cytoskeleton Animation</li> <li>Checkpoint 2 (Non-graded)</li> </ul>
Unit 4	5-6	4.1 Cell Transport 4.2 Lab - Egg Osmosis
Unit 5	7	<ul><li>5.1 DNA</li><li>5.2.1 Extracting DNA from Strawberries - Lab Preparation</li><li>5.2.2 Extracting DNA from a Strawberry</li><li>5.3 Technology in Biology: Polymerase Chain Reaction</li></ul>
Midterm		*Midterm Exam
Unit 6	8-9	<ul><li>6.1 Protein Synthesis</li><li>6.2 mRNA Coding Practice - Using a Codon Chart</li></ul>

Unit	Weeks	Assignments
Unit 7	10	<ul> <li>7.1 Mutations and Adaptations</li> <li>7.2.1 Hide and Seek Moth Lab Preparation</li> <li>7.2.2 Lab - Moth Hide and Seek</li> <li>Unit 7 Discussion Board: Find an Example of an Adaptation</li> <li>7.4 Evolution and Natural Selection</li> <li>7.5 Evolution of Blood</li> </ul>
Unit 8	11-12	<ul> <li>8.1 Basics of Genetics</li> <li>8.2 Solving Genetics Problems</li> <li>8.3 Genetics Practice</li> <li>8.4 Dihybrid Cross Practice</li> <li>8.5 Baby Lab Preparation</li> <li>8.6 Baby Lab</li> </ul>
Unit 9	13	<ul> <li>9.1 Cell Cycle and Mitosis</li> <li>9.2 Replication Assignment</li> <li>9.3 Lab - Build Models</li> <li>9.4 Meiosis</li> <li>9.5 Discussion Board - Animations and Study Aids</li> </ul>
Final Project	14	*Project Upload Checkpoint 3 (Non-graded)
	15	*Final Exam

# **Course Credit**

The course grade will be calculated as follows:

- 50% coursework average;
- 50% summative assessment average, including the Unit 1 Design Your Own Experiment, the Midterm, the Final Project, and the Final Exam;
- A passing course grade is 70 or higher.

Students must attempt all assignments in the course. The final exam will not be available until all assignments have been accepted and graded by the teacher.

Students who score below 70% on the final exam will be eligible for one re-exam opportunity.

### Coursework

The lessons, assignments, labs, and discussions within each lesson are formative in nature. This means that they are designed to assist you in applying and demonstrating the lesson concepts, as well as identifying areas in which you need additional review.

When you work through the learning material, you'll find self-checks that help you gauge how well you're understanding the material in the moment. You can retry most of these questions. Then you will upload assignments and labs for your teacher to check.

### **Summative Assessments**

Summative assessments are those that allow you to demonstrate mastery of the course objectives. For summative assessments, you will NOT be allowed to use the learning materials. These are opportunities for you to show what you have learned by that point in the course.

Summative assessments may be proctored using the online proctoring system Proctorio. Information about Proctorio is provided in **Remote Proctoring** in the Syllabus section of your course. The summative assessments for this course are as follows:

- Summative Assessments (20% of Course Grade)
  - Unit 1 Design Your Own Experiment
  - o Midterm
  - Final Project
- Summative Final Exam (30% of Course Grade)

# **Course Completion**

- Students may not complete the course in less than 30 days.
- All courses expire six months after the enrollment date.

# **Academic Integrity**

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

"Scholastic dishonesty" includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

# **Student Expectations**

You will be expected to log into the Blackboard course regularly to be aware of possible announcements/reminders and to pace your progress in the course.

Students are expected to maintain an online environment conducive to learning, which includes "netiquette" (Internet etiquette). Please review the basic rules for <u>Online</u> <u>Discussion Netiquette</u>. Ensure that your email messages, discussion board postings,

and other electronic communications are thoughtful and respectful. Diverse opinions are welcome in this course, and you are expected to demonstrate an open mind and courtesy when responding to the thoughts and ideas of others.

The following are prohibited:

- making offensive remarks in email or the discussion board;
- using inappropriate language or discussing inappropriate topics online;
- spamming;
- hacking;
- using TTU or Blackboard email or discussion boards for commercial purposes;
- using all caps (considered shouting in online communications); and
- cyber-bullying or online harassment of any type.

Inappropriate behavior shall result in consequences ranging from a request to correct the problem, to removal from the course or even the university, depending on the severity of the behavior. Disciplinary actions will be taken according to the TTU K-12 Student Handbook.

### Communication

- You can expect a reply from your instructor within 2 business days.
- Use the Blackboard Course Messages tool for sending messages to your instructor.

# **Submitting Assignments**

You will submit all assignments through the Blackboard Assignment Tool, rather than by mail or email.

# **Technical Difficulties**

#### **Getting Help**

For student assistance with Blackboard, visit TTU K-12 Support.

#### **Computer Problems**

A working computer is necessary for online coursework. Computer problems will not be accepted as a valid reason for failure to complete course activities within the allotted time frame. Identify a second computer, before the course begins, that you can use if you experience computer problems.

#### Server Problems

When the Blackboard server needs to be taken down for maintenance, the Blackboard administrator will post an announcement in your course informing you of the time and

date. If the server experiences unforeseen problems, your course instructor will notify you.

#### Lost or Corrupted Files

You must keep/save a copy of every project/assignment on an external disk or personal computer. In the event of any kind of technology failure (e.g., Blackboard server crash or virus infection, students' own computer problems, loss of files in cyberspace, etc.) or any disputes, the instructor may request or require you to resubmit the files. In some instances, the instructor may need to open another attempt within Blackboard, so communication with your instructor is critical in these circumstances.