

# Biology 10 (Biol 10) Introduction to Life Science

<i>Semester: Fall 2022</i> <i>Reedley Community College</i>	
Lecture Instructor: Dr. Christopher Emerling Email: christopher.emerling@reedleycollege.edu	<i>Class No. 52002</i> Lecture: T/Th 3:30–4:45 pm, Math & Science 204
In-person Office Hours: MTWTh 1:00–1:50 pm, LFS 13 Online Office hours: Th 10–10:50 am Zoom ID: 990 6009 7271 Phone: extension 3134 Can request appointments <i>Class Dates: 8/8/22–12/9/22</i>	

## Catalog Description:

This lecture course is recommended for the non- biological science and pre-education majors. This is an introductory course using biological concepts. The organismal structure, function, inheritance, evolution, and ecology are covered. Not open to students with credit in Biology 3. (A, CSU-GE, UC, I)

## Prerequisites:

None, English 1A or 1AH recommended.

## Student Learning Outcomes:

Upon completion of this course, students will be able to:

1. Apply the principles of Mendelian genetics to evolutionary theory and human medicine.
2. Understand the chemical basis of life.
3. Assess human impacts on natural systems and critically evaluate solutions to environmental problems.
4. By examining anatomical and physiological features.
5. By investigating chemical and energy relationships.
6. Classify the wide range of living organisms and identify the evolutionary mechanisms that have impacted this diversity.
7. Evaluate current scientific literature and examine how the scientific method is employed in biological research.
8. Examine the function of DNA and recognize how its discovery has impacted modern science.
9. Understand the cellular basis of life.
10. Identify levels of biological organization and apply these concepts to living systems.
11. By examining anatomical and physiological features.
12. By investigating chemical and energy relationships.

## Course Objectives:

In the process of completing this course, students will:

1. compare anatomical and physiological features seen in the animal kingdom
2. compare and contrast Eukaryote and Prokaryote cell structure.
3. demonstrate knowledge of evolutionary theory and identify the different mechanisms responsible for biological change.
4. describe energy flow and nutrient cycling within an ecosystem. -consider human impact on natural systems.
5. diagram plant life cycles and identify major plant adaptations.
6. distinguish the processes of transcription and translation and identify their roles in protein synthesis.

7. explain and compare the processes of photosynthesis and cellular respiration.
8. read scientific literature and apply the steps of the scientific method to laboratory research.
9. recognize chemical elements, bonds and properties of water.
10. relate principles of population ecology to the study of the global human population.
11. calculate genetic probabilities based on the principles of Mendelian genetics. -identify human genetic mutations and explain probable causes for their occurrence.

## TENTATIVE SCHEDULE

Week	Lecture	Readings	Assignments
Week 1: 8/8–8/12	Course Intro Unit 1. What is Science? Science limitations	Ch. 1.2. The Process of Science	
Week 2: 8/15–8/19	Unit 1. Science limitations cont'd, First Scientific Experiment  Unit 1. How Scientists Minimize Bias		
Week 3: 8/22–8/26	Unit 1. How Scientists Minimize Bias cont'd  Unit 1. Scientific Community in Action		
Week 4: 8/29–9/2	Exam day  Unit 2. Atoms & Molecules	Ch. 2.1. The Building Blocks of Molecules, 2.2 Water	
Week 5: 9/5–9/9	Unit 2. Organic molecules, Lipids, Carbs  Unit 2. Enzymes, Proteins, Nucleic Acids	Ch. 2.3 Biological Molecules  Ch. 3.1 How Cells Are Studied	Choose paper topic
Week 6: 9/12–9/16	Unit 2. How DNA encodes traits, Transcription & Translation  Unit 2. Transcription & Translation cont'd	Ch. 9.1 The Structure of DNA, 9.3 Transcription, 9.4 Translation  Ch. 9.5 How Genes Are Regulated, 10.1 Cloning & Genetic Engineering, 10.2 Biotechnology in Medicine & Agriculture	
Week 7: 9/19–9/23	Unit 3. Metabolism  Unit 3. How Cells Move Substances, Homeostasis, Response to Stimuli, Reproduction	Ch. 1.1. Themes and Concepts of Biology, 4.1 Energy & Metabolism, Glycolysis, 4.4 Fermentation  Ch. 3.4 The Cell Membrane, 3.5 Passive Transport, 3.6 Active Transport	
Week 8: 9/26–9/30	Unit 3. Adaptation, Viruses  Exam day	Ch. 17.1 Viruses	
Week 9: 10/3–10/7	Unit 4. Eukaryotic cell structure, Mitochondria & Chloroplasts	Ch. 3.2 Comparing Prokaryotic & Eukaryotic Cells, 3.3 Eukaryotic Cells, 13.2 Eukaryotic Origins, 4.3 Citric Acid Cycle & Oxidative Phosphorylation, 5.1 Overview of Photosynthesis	Choose Research Sources

	Unit 5. Multicellularity, Mitosis	Ch. 9.2 DNA replication, 6.2 The Cell Cycle, 6.3 Cancer and the Cell Cycle, 18.2 Development & Organogenesis	
Week 10: 10/10–10/14	Unit 5. Meiosis  Unit 5. Genetics	Ch. 7.1 Sexual Reproduction, 7.2 Meiosis  Ch. 6.1 The Genome, 8.1 Mendel's Experiments, 8.2 Laws of Inheritance	
Week 11: 10/17–10/21	Unit 5. Genetics cont'd  Unit 6. Evolution & DNA	Ch. 8.3 Extensions of the Laws of Inheritance  Ch. 11.1 Discovering How Populations Change, 11.2 Mechanisms of Evolution, 11.4 Speciation	Paper Outline Due
Week 12: 10/24–10/28	Unit 6. Evolution & Shared Traits  Exam day	Ch. 11.3 Evidence of Evolution, 11.5 Common Misconceptions about Evolution, 12.1 Organizing Life on Earth, 12.2 Determining Evolutionary Relationships	
Week 13: 10/31–11/4	Unit 7. Unicellular life, Algae, Plants  Unit 7. Plant Reproduction, Fungi	Ch. 13.1 Prokaryotic Diversity, 13.3 Protists, 14.1 The Plant Kingdom  Ch. 14.2 Seedless Plants, 14.3 Seed Plants: Gymnosperms, 14.4 Seed Plants: Angiosperms, 13.4 Fungi	
Week 14: 11/7–11/11	Unit 7. Simple Animals, Arthropods  Unit 7. Fishes, Amphibians, Reptiles	Ch. 15.1 Features of the Animal Kingdom, 15.2 Sponges & Cnidarians, 15.3 Flatworms, Nematodes & Arthropods, 15.4 Mollusks & Annelids  Ch. 18.1 How Animals Reproduce, 15.6 Vertebrates	Rough Draft Due
Week 15: 11/14–11/18	Unit 7. Birds, Mammals  Unit 8. Population, Community Ecology	Ch. 19.1 Population Demographics & Dynamics, 19.2 Population Growth & Regulation, 19.3 The Human Population, 19.4 Community Ecology	Peer Review
Week 16: 11/21–11/25	Unit 8. Ecosystem Ecology	Ch. 20.1 Waterford's Energy Flow through Ecosystems, 20.2 Biogeochemical Cycles, 2.3 Terrestrial Biomes, 20.4 Aquatic & Marine Biomes	
Week 17: 11/28–12/2	Unit 8. Global Ecology, Conservation Biology  Exam day	Ch. 21.1 Importance of Biodiversity, 21.2 Threats to Biodiversity, 21.3 Preserving Biodiversity	Final Paper Due
Week 18: 12/5–12/9	Final Week		

## Required Course Materials

- The textbook is a free open educational resource (OER) which can be found at the link here <https://openstax.org/details/concepts-biology>. Weekly readings can be found in the tentative schedule above.

## Technology Requirements

- The web/online portion of this course will occur through Zoom (synchronous lectures) and Canvas. All students must have access to a device with internet access to that allows students to retrieve and complete assignments through Canvas.
- Check Canvas and your Reedley College email accounts regularly (multiple times per week) for announcements.
- If you need access to technology in order to complete your course, please make sure to contact the [Information Center](#) to check out a laptop or other needed technology.

## ATTENDANCE AND DROP/ADD POLICY

Attendance is expected of all students every week in this class. In order to avoid being dropped from this class, you must attend the first day of lecture and/or lab, unless you contact me ahead of time to provide a legitimate excuse for your absence.

Beyond this, I reserve the right to drop students (both enrolled and waitlisted) based on the following policy:

1. Student does not attend the remainder of the first week
2. Student does not attend the second week assignment and does not respond to contact efforts from the professor during the third week

## ASSESSMENTS

Assignment Description	Points
Exams	90%
Term paper	10%

The final course grade is based on a non-traditional scale:

Percent Range	Grade
80-100	A
60-79.99	B
40-59.99	C
20-39.99	D
Less than 20	F

**Course grades are non-negotiable.** Instructor reserves the right to adjust individual tests and/or assignments should it be to the benefit to the entire class. Final grades may be adjusted to the benefit of the students, should there be a justifiable reason for doing so. I do not round up grades to the next letter grade given that there are multiple opportunities to boost grades during the course.

## ASSESSMENTS

**Exams** These may be any combination of multiple-choice, true-false, matching, short-answer and essay questions based on the main objectives of each lecture and may be based on words only or may include images. Please note that I require spelling and grammar be as close to accurate as reasonably possible; spelling must be at least phonetically approximate, such that it is unambiguous what your answer is. If I can't clearly understand it, I can't give you points for it.

**Writing assignment** You will be writing a paper on an organism of your choice, and your grade will depend on the final product of your paper. However, we will be gradually working on this throughout the semester by coming up with a topic, finding sources, writing an outline, completing a rough draft, and giving feedback to your peers on their drafts, culminating in a final version of the paper.

## LATE ASSIGNMENTS AND EXAM MAKE-UP POLICY

The only assignment for the course with a due date is the final paper. This will be due in week 17, and given that you have 17 weeks to complete it, you likely will not receive an opportunity to submit it late. Possible exceptions may include if the student falls victim to extreme, **documentable** circumstances. The same applies for exams, but only up to a certain point. If a student misses an exam, they will have finals week to make up any missed.

## EXTRA CREDIT

I do not provide extra credit opportunities in a traditional sense. My belief is that you need to learn and complete what we are doing in class, not something beyond the scope of the normal content. However, I do believe strongly in providing the chance to learn from your mistakes and being able to master content on subsequent attempts. As such, during finals week, you will have the opportunity to 'retake' any of the exams that you had previously taken. They will not be identical to the earlier versions of the exams, but rather include highly similar content. The grades on any exams you retake will replace your original exam score, whether higher or lower.

## COMMUNICATION POLICY

The best way to get ahold of me is to send me a direct message through Canvas. The second best way is to email me at [christopher.emerling@reedleycollege.edu](mailto:christopher.emerling@reedleycollege.edu). Don't know how to send a message in canvas? Check out this quick guide [How to send a message in canvas](#).

- Please allow a 24hr response time on business days (Mon-Fri). I tend to be very prompt with my email responses, however, there are times when it may take me up to 24hrs to respond. As a rule, I try to prioritize messages and e-mails that require an immediate response over those that are less urgent, so please indicate if the message is urgent. If you do not receive a response from me after 24hrs then please double check that you have contacted me correctly (e.g., was it the correct email address?), and then try both Canvas messages and e-mail.
- Emailing and messaging can be used 24/7. If I expect to be away from my computer for any significant length of time, you will be notified in advance.

## OFFICE HOURS

Office hours are a great chance to meet one-on-one with your instructor, so you can get extra clarification on concepts that you have found difficult, practical advice on studying, additional context for completing assignments, and otherwise general support in the course. You can stop by my office directly during these hours, but if you cannot make it in person, I can jump onto Zoom and chat with you. My office hours office number, the Zoom ID and are posted on the first page of this syllabus. Office hours likely will not be posted in the first week but will be posted as soon as I have all the information I need to schedule them.

## CANVAS

All lecture slides will be located on Canvas, which you can access here:

<https://scccd.instructure.com/login/ldap>. Please turn on e-mail notifications for Announcements in

Canvas or check them regularly. You can find them under the tab “Announcements” and see the three most recent announcements at the top of the course page.

## STARFISH

I will be using a service called “Starfish” throughout the semester as a way to provide you with progress reports. Of course, you are able to view your grade any time on Canvas, but this gives me a way to acknowledge your success or encourage you if you’re struggling during the class. If you’re having a particularly difficult time, enough Starfish alerts from your instructors can trigger your counselor to contact you and help you to figure out the best plan of action for the course (i.e., whether to drop, get tutoring, change majors, etc.). Check your emails periodically in case you receive any Starfish alerts or “kudos” from myself or other instructors.

## DROPPING THE COURSE

It is the student’s responsibility to drop themselves from the course, not the professor. Here are some important dates, derived from the [Reedley College Academic Calendar](#):

**August 19<sup>th</sup>**: last day to drop for full refund

**August 26<sup>th</sup>**: last day to drop to avoid a “W”; last day to Add in person

**October 7<sup>th</sup>**: last day to drop (letter grades assigned after this date)

## TUTORING

We may have a tutor embedded in our course this semester. The tutors are former, successful students who understand the material well, know how to study for the class and can help you succeed. I highly recommend most students to receive tutoring, even students who tend to do reasonably well. Students that are getting tutored are not ‘less than’ others who don’t go to tutors. I received tutoring when I was in college (calculus and physics), and this tutoring helped me enormously to succeed in those classes.

## COLLEGE POLICIES

The university has several policies that you will be expected to adhere to in my course. The policies on **Disabled Students Programs and Services, Student Conduct Standards, Academic Dishonesty**, and the **Computer/Network Equipment Use Policy**, portions of which are below, can all be found in the Reedley College Catalog.

**Academic Dishonesty:** “Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly attained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences.” Reedley College Catalog. In an online classroom, academic dishonesty can manifest as copying other students’ work, sharing answers on exams and much more. When you cheat, not only do you defraud the college, but you devalue your education and the education of others by weakening the integrity of our institution. Furthermore, in my experience, cheaters almost never succeed at their career goals, so don’t ruin your opportunity to learn!

Please see the Student Conduct Standards and Grievance Procedures Handbook available in the Vice-President of Student Services office, or at the links listed below.

Student Conduct Standards: <https://www.reedleycollege.edu/about/about-us/policies-and-procedures/student%20conduct%20standards.html>

Grievance Procedures: <https://www.reedleycollege.edu/about/about-us/policies-and-procedures/grievance-procedures.html>

**Academic Accommodations:** If you have a verified need for an academic accommodation or materials in alternate media (e.g. Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact the instructor as soon as possible.

### **DIVERSITY STATEMENT**

Diversity is not only a fact of life but, to me, it is one of life's most beautiful traits and greatest strengths. My goal is for all students from all backgrounds and perspectives to be able to succeed, thrive and feel valued in my courses. My valuing of diversity encompasses gender, sexual identity, disability and health status, age, socioeconomic status, religion, philosophy, ethnicity, race, and culture. If you believe that my course and/or my instructional techniques are in any way invalidating your group identity or are in some way hampering your ability to succeed, please let me know so that I can address any concerns you have.

### **FINAL NOTES**

Every syllabus represents the intended roadmap and structure of the course, but due to unforeseen events and/or feedback during the semester, adjustments may be necessary. This is a reminder that some details described in this syllabus or potentially subject to change at the discretion of the instructor, but he will inform you as promptly and clearly as possible as to the reasoning for any changes.

Student Learning Outcomes are statements about what the discipline faculty hope you will be able to do at the end of the course. This is NOT a guarantee: the ultimate responsibility for whether you will be able to do these things lies with you, the student. In addition, the assessment of Student Learning Outcomes is done by the department in order to evaluate the program as a whole, and not to evaluate individual faculty performance.