

# Biology 10H (Biol 10H) Introduction to Life Science Honors

<i>Semester: Spring 2024</i>		<i>Reedley Community College</i>
Lecture Instructor: Dr. Chris Emerling Email: christopher.emerling@reedleycollege.edu		<i>Class No. 50012</i> Lecture: MW 12–1:15 pm, MSCI 204
Office Hours, Life Sciences (LFS) 13: MW 3:20–4:10 pm, TTh 11–11:50 am Online Office hours: Fri 10–10:50 am Zoom ID: 990 6009 7271 Phone: extension 3134		<i>Class Dates: 1/8/24–5/17/24</i>

## Catalog Description:

This lecture course is recommended for the non- biological science and pre-education majors seeking honors natural science credit. In this introductory course a range of biological concepts will be examined; organismal structure, function, inheritance, evolution, and ecology are covered. Within this course honors level student directed research will be incorporated into the teaching curriculum. This course is 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. Demonstrate skills in conducting academic and scientific research through peer reviewed literature.
2. Identify structures of a cell and describe their function
3. Describe evolutionary theory and apply knowledge to understanding of natural systems.
4. Develop an understanding of the effects of humanity and human development on the natural world
5. Diagram the life cycles and adaptations of plants and animals.
6. Develop the skills to read and apply scientific literature as a component of the scientific method.
7. Recognize the chemical and molecular aspects of biology including, elements, and biological macromolecules, transcription and translation.
8. Describe the process of cellular division and relate these processes to patterns of inheritance.

## Course Objectives:

In the process of completing this course, students will:

1. Demonstrate skills in conducting academic and scientific research through peer reviewed literature.
2. Compare anatomical and physiological features seen in the animal kingdom.
3. Compare and contrast cell structure, function, as pertaining to prokaryotic and eukaryotic cells.
4. Demonstrate knowledge of evolutionary theory and apply knowledge to understanding of natural systems.
5. Develop an understanding of the effects of humans on natural systems.
6. Diagram the life cycles and adaptations of plants and animals.
7. Distinguish the processes of transcription and translation and identify their roles in protein synthesis.
8. Explain and compare the processes of photosynthesis and metabolism including cellular respiration.
9. Develop the skills to read and apply scientific literature as a component of the scientific method.
10. Recognize the chemical aspects of biology including, elements, and biological macromolecules.

11. Perform problem solving for genetic principles in accordance with Mendelian genetics, and the role of genetics in health.

### TENTATIVE SCHEDULE

Week	Lecture	Readings	Assignments
Week 1: 1/8–1/12	Course Intro Unit 1. What is Science? Unit 1. Science limitations, First Scientific Experiment	1.2 The Process of Science	
Week 2: 1/15–1/19  <b>No class Monday (MLK day)</b>	Unit 1. How Scientists Minimize Bias		
Week 3: 1/22–1/26	Unit 1. Scientific Community in Action		
Week 4: 1/29–2/2	Unit 2. Atoms & Molecules Unit 2. Organic molecules, Lipids, Carbs	2.1 The Building Blocks of Molecules; 2.2 Water  2.3 Biological Molecules	<b>Unit 1 Exam</b>  Choose Research Topic
Week 5: 2/5–2/9	Unit 2. Enzymes, Proteins, Nucleic Acids  Unit 2. How DNA encodes traits, Transcription & Translation	9.1 The Structure of DNA; 9.3 Transcription; 9.4 Translation  10.1 Cloning and Genetic Engineering; 10.2 Biotechnology in Medicine and Agriculture; 10.3 Genomics and Proteomics	Choose Research Article
Week 6: 2/12–2/16  <b>No class Friday (Lincoln Day)</b>	Unit 3. Metabolism, How Cells Move Substances, Homeostasis  Unit 3. Response to Stimuli, Reproduction, Adaptation, Viruses	1.1 Themes and Concepts of Biology; 4.1 Energy and Metabolism; 4.2 Glycolysis; 4.4 Fermentation  3.4 The Cell Membrane; 3.5 Passive Transport; 3.6 Active Transport; 17.1 Viruses	
Week 7: 2/19–2/23			<b>Units 2 &amp; 3 Exams</b>

<b>No class Monday (Washington Day)</b>	Unit 4. Eukaryotic cell structure, Mitochondria & Chloroplasts	3.1 How Cells Are Studied; 3.2 Comparing Prokaryotic and Eukaryotic Cells; 3.3 Eukaryotic Cells; 4.3 Citric Acid Cycle and Oxidative Phosphorylation; 5.1 Overview of Photosynthesis; 13.2 Eukaryotic Origins	
Week 8: 2/26–3/1	Unit 5. Multicellularity  Unit 5. Mitosis	6.1 The Genome; 6.2 The Cell Cycle  6.3 Cancer and the Cell Cycle; 6.4 Prokaryotic Cell Division	Peer-review article assignment Due
Week 9: 3/4–3/8	Unit 5. Meiosis	7.1 Sexual Reproduction; 7.2 Meiosis  7.3 Variations in Meiosis	<b>HONORS:</b> 2nd article due
Week 10: 3/11–3/15	Unit 5. Genetics	8.1 Mendel’s Experiments; 8.2 Laws of Inheritance  8.3 Extensions of the Laws of Inheritance	<b>HONORS:</b> 3rd article due
Week 11: 3/18–3/22	Unit 6. Evolution & DNA  Unit 6. Evolution & Shared Traits	11.1 Discovering How Populations Change; 11.2 Mechanisms of Evolution; 11.3 Evidence of Evolution  12.2 Determining Evolutionary Relationships; 11.4 Speciation; 11.5 Common Misconceptions about Evolution	<b>HONORS:</b> 4th article due
<b>SPRING BREAK: 3/25–3/29</b>	<b>NO CLASS</b>		
Week 12: 4/1–4/5	Unit 7. Unicellular life, Algae, Plants  Unit 7. Plant Reproduction, Fungi	13.3 Protists; 14.1 The Plant Kingdom; 14.2 Seedless Plants  14.3 Seed Plants: Gymnosperms; 14.4 Seed Plants: Angiosperms; 13.4 Fungi	<b>HONORS:</b> 5th article due
Week 13: 4/8–4/12			<b>Units 4, 5 &amp; 6 Exams</b>

	Unit 7. Simple Animals, Arthropods	15.1 Features of the Animal Kingdom; 15.2 Sponges and Cnidarians; 15.3 Flatworms, Nematodes, and Arthropods; 15.4 Mollusks and Annelids	
Week 14: 4/15–4/19	Unit 7. Fishes, Amphibians, Reptiles Unit 7. Birds, Mammals	15.6 Vertebrates	
Week 15: 4/22–4/26	Unit 8. Population Ecology Unit 8. Community Ecology	19.1 Population Demographics and Dynamics; 19.2 Population Growth and Regulation; 19.3 The Human Population; 19.4 Community Ecology	
Week 16: 4/29–5/3	Unit 8. Ecosystem Ecology	20.1 Waterford's Energy Flow through Ecosystems; 20.2 Biogeochemical Cycles 20.3 Terrestrial Biomes; 20.4 Aquatic and Marine Biomes	
Week 17: 5/6–5/10	Unit 8. Global Ecology, Conservation Biology	21.1 Importance of Biodiversity; 21.2 Threats to Biodiversity; 21.3 Preserving Biodiversity	<b>HONORS:</b> Presentation due
Week 18: 5/13–5/17	<b>Finals Week</b>		<b>Units 7 &amp; 8 Exams</b>

### Required Course Materials

- There is a *free* textbook available to read and/or download online at <https://openstax.org/details/books/concepts-biology> Chapter readings listed in the Tentative Schedule above.

### Technology Requirements

- All students must have access to a device with internet access to that allows students to retrieve and complete assignments and obtain learning materials 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 order to avoid being dropped from this class, you must attend the first day of lecture, 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 second and/or third weeks of class
2. Student does not respond to contact efforts from the professor after missing the second week of class

## ASSESSMENTS

Assignment Description	Points
Exams	95%
Honors Research Project	5%

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 other types of questions based on topics discussed in each lecture, and highlighted in the study guides. Questions may be based on words only or may include images. Please note that I require spelling and grammar to 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.

**Honors Research Project** You will be reading peer-reviewed scientific literature on an organism of your choice, culminating in a presentation on the research you have conducted. In addition to being worth 5% of your grade, it is, in effect, considered a quasi-mandatory assignment. If you do not perform your presentation, you **cannot** receive an 'A' letter grade, and can only receive a 'B' at the highest. For example, if you end the class with a 92%, and you complete the presentation, you will receive an 'A'. If you end the class with a 92% and you do not complete the presentation, you will receive a 'B'. If you end the class with a 78%, regardless of whether you completed the presentation, you will receive a 'B', and so on.

## **LATE ASSIGNMENTS AND EXAM MAKE-UP POLICY**

The Honors Research Project presentation will have a due date that is generally non-negotiable. Possible exceptions may include if the student falls victim to extreme, **documentable** circumstances on the days leading up to the submission of the assignment. The same applies for lecture exams, but only up to a certain point. If a student misses an exam, they will have finals week to make up a portion of those that are missed.

## **EXTRA CREDIT**

I do not provide extra credit opportunities in a traditional sense. My belief is that the goal is for you 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' several of the exams that you had previously taken. They will not be identical to the earlier versions of the exams, but rather will include similar content. The grades on any exams you retake will replace your original exam score, whether it is higher or lower.

## **COMMUNICATION POLICY**

The best way to get ahold of me is to send me a direct message through Canvas. Don't know how to send a message in canvas? Check out this quick guide [How to send a message in canvas](#). The second best way is to email me at [christopher.emerling@reedleycollege.edu](mailto:christopher.emerling@reedleycollege.edu). I regularly check announcements for comments and replies, so this is also a viable option for communicating about specific content.

Please allow a 24hr response time on business days (Mon-Fri). I often reply on weekends as well, but given that I try to give myself breaks from work, please do not assume that I will reply on non-business days. I tend to be very prompt with my responses, however, there are times when it may take me up to 24hrs or more to respond. As a rule, I try to prioritize Canvas 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 again with 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 instructors, 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. If you wish to meet on Zoom, please contact me as soon as possible to schedule it so I can ensure that I'm available. My office hours, office number and my Zoom ID are posted on the first page of this syllabus. Office hours may not be posted in the first week or may be altered given changes in scheduling. However, they will be posted as soon as I have all the information I need to schedule them.

## **CANVAS**

All course content will be located on Canvas. 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" during some points of the semester as a way to provide you with progress reports and to make referrals. 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, though the professor may drop you under certain conditions (see above). Here are some important dates:

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

**January 28<sup>th</sup>:** last day to drop to avoid a "W"

**March 8<sup>th</sup>:** last day to drop to earn a "W"; 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 that most students 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 it 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 so he can help determine how to best accommodate you. If you have not already, you should contact Disabled Student Programs & Services (DSP&S) as soon as possible so they can begin to assign your accommodations.

## **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 are potentially subject to change at the discretion of the instructor, but I 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.