



BIO 302G

Biotechnology & Our Future

Fall 2021

Unique Numbers: 48545, 48550, 48555, 48560, 48565, 48580

Meeting Time & Place: 12 pm & 1 pm MWF, BUR 112 & Zoom

Instructor: Dr. E. Jane Bradbury, Ph.D.

E-mail: e.jane.bradbury@utexas.edu

Course Format: Hybrid

Office Hours: MWF: 11 am – 12 pm BUR 112 & Zoom

TA Information: Please see the Course Resources section of Canvas

Course Description:

“Biotechnology & Our Future” is an introductory biology class for non-science majors and fulfills the requirement of 3 credits of natural sciences for all non-science majors. As such, it will provide a comprehensive introduction to the key themes of biology, including biological macromolecules, cell structure and function, energy metabolism, molecular genetics, inheritance, cellular division, evolution, and ecology. However, this course also has the special focus of learning about biotechnology in the model context of the climate crisis. Students will learn about different aspects of the climate crisis and the fundamental biology concepts needed to understand each aspect. The course has three units: The Carbon Cycle, Atmospheric Chemistry & Marine Systems, and Disturbance & Terrestrial Systems. Biotechnologies addressing each of the facets of the climate crisis will be addressed in conjunction with the underlying biology of each problem-technology pair.

Additionally, this course is intended to provide proficiency and basic literacy in scientific thinking and skills. Integrated with the course content are several skills modules that focus on quantitative reasoning and analysis, hypothetical research frameworks, accessing and evaluating information, oral communication of scientific concepts, self-directed learning, and working effectively in teams. This course will help you understand the biological world while empowering you to navigate an increasingly challenging informational landscape.

Finally, even though this course is a Biology course, in many ways, it is also a *language* course—there are more new vocabulary words in the average introductory biology course than in an introductory foreign language course! Because this is a non-majors course, we will try to make vocabulary a less significant component, however, it is inescapable. You will want to make regular vocabulary memorization practice a part of your study routine.

Core Content Objectives:

By the end of this course, students should be able to:

- 1) Describe the geological events and biological processes that create the carbon cycle to explain how human-caused carbon emissions reverse the balance of carbon exchange.



- 2) Explain the unique effects of the climate crisis on oceans and why these effects are significant to ocean systems.
- 3) Use the principles of gene regulation, evolution, and ecology to describe the short- and long-term effects of extended climate crisis-mediated disturbance on terrestrial systems.
- 4) Evaluate proposed technological solutions to the challenges of climate change for biological efficacy relative to the standard of natural ecological processes.

Core Skills Objectives:

By the end of this course, students should be able to:

- 1) Select reliable, credible sources that are most relevant to a research topic using multiple criteria.
- 2) Present information from multiple sources and follow content, organizational, and design guidelines in order to deliver an oral presentation in the time allotted
- 3) Identify components of a research study that support or fail to support a stated hypothesis.
- 4) Understand how mathematical models are used in data analysis and fluently interpret visual representations of data analysis.
- 5) Describe the ethical imperative science has to society and how this relates to the basic tenets of ethical behavior.
- 6) Learn in a self-directed manner through understanding of metacognitive strategies.
- 7) Work effectively in organized teams to plan and execute a multistage project.

Required Materials and Technologies:

- Student subscription to the in-class online interactive learning platform TopHat
- *Biological Principles & Our Future*, by EJ Bradbury, e-book available on TopHat
- Either a laptop or desktop computer with capacity to access Google Chrome or Safari, and Zoom and reliable access to high bandwidth internet

Helpful Materials and Technologies:

- Headset with microphone

Class Teaching Modality:

This class is a “hybrid” on-line and in-person class. This teaching modality affords your teaching team the flexibility to change how course instruction is delivered depending on the status of the on-going pandemic. We strive to conduct as much of the class in-person as possible, however, safety is our highest priority. Thus, we will likely have both in-person and synchronous on-line course components throughout the semester. Check Canvas for weekly updates on instruction implementation.



Course Points Allocation:

Course credit will come from a combination of individual homework assignments, lecture engagement, weekly discussion activities, “quizzams”, and final group project. The points allocation for the course is as follows:

Assessment	Points
Homework, Lecture, & Discussion Assignments	300
6 Quizzams @ 25 points each	150
Final Group Project	100
<i>Total Points</i>	550

Final Grade Determination Grading Scale:

Percentage	Letter Grade
93% and above	A
90% - 92.99%	A-
86% - 89.99%	B+
83% - 85.99%	B
80% - 82.99%	B-
76% - 79.99%	C+
73% - 75.99%	C
70% - 72.99%	C-
66% - 69.99%	D+
63% - 65.99%	D
60% - 62.99%	D-
59.99% and below	F

Re-Grade Policy:

There are no re-grade opportunities outside of keying or rubric errors. If there is a keying or rubric error applied to your assignment, you should attend office hours to resolve it.

Teaching & Learning Philosophy:

An important part of succeeding in this course is understanding the underlying philosophy behind my teaching strategies. Education should be valued for its ability to grow and strengthen the mind. I expect you to be engaging in this course because you desire to improve yourself and your cognitive abilities. This attitude carries with it an implicit sense of self-responsibility for one’s own learning. I am not here to *teach you* as much as I am here to *help you learn*. I do my best to craft my courses to provide a diverse set of learning opportunities, including lectures, but just as much of the course content will be communicated with readings and other exercises. Similarly, there is a vast body of literature that cannot be formally included in the course but which I encourage you to explore in your quest for understanding specific facets of course content. I cannot tell you “everything you need to know”—that’s not how true learning works. However, I am committed to providing you with the best possible learning environment to expand your understanding of the science and systems of life!



University Policies:

Religious holy days: A student who misses classes or other required activities, including examinations, for the observance of a religious holy day should inform the instructor at least one week before the absence and be prepared to complete the assignment before the absence.

Students with Disabilities: Please notify your instructor of any modification/adaptation you may require to accommodate a disability-related need. You may find out more information on the Services for Students with Disabilities website: <http://diversity.utexas.edu/disability/> and/or <http://diversity.utexas.edu/disability/how-to-register-with-ssd/>

Policy on Scholastic Dishonesty: Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Policies on scholastic dishonesty will be strictly enforced. For further information, please visit the Office of Student Conduct and Academic Integrity website at <http://deanofstudents.utexas.edu/conduct/>.

Use of E-mail for Official Correspondence to Students: All students should be familiar with the University's official e-mail student notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. The complete text of this policy and instructions for updating your e-mail address are available at <http://www.utexas.edu/its/policies/emailnotify.html> .

University of Texas Honor Code: "As A Student Of The University Of Texas At Austin, I Shall Abide By The Core Values Of The University And Uphold Academic Integrity."