BIO 302G **Biotechnology & Our Future** **Fall 2020**

Unique Numbers: 46850, 46855, 46860, 46865, 46870, 46875, 46880, 46885, 46890, 46895, 46900, 46905

Meeting Time & Place: Online via Canvas, TopHat, and Zoom

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

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

Course Format: Online, mostly asynchronous, with one weekly synchronous session

Synchronous Meeting Times via Zoom: Lectures (Optional): Mon. 10 am & Wed. 12 pm
Discussion Meetings: Your Weekly Time

Office Hours via Zoom, CST: Individual Sessions: Mon. 11 am, Tues. 10 am, & by appt.
Group Sessions: Wed. 10 am; Fri. 3 pm

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 is will help you understand the biological world while empowering you to navigate an increasingly challenging informational landscape.

Finally, though this course is a Biology course, I encourage all students to also view it as 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.

As an online course, this class requires a higher level of independence in learning and initiative. We will try to foster these skills and provide a scaffolded time line to help stay on track. However, the expectation is that students are well-prepared to learn in an online setting.

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

Online Class Format:

The online administration of the class will contain both synchronous and asynchronous. The majority of the course will be asynchronous but with structured "available" times and "due" times for activities. This is to encourage you to engage a little bit with the course each day of the week (M – F) while maintaining flexibility for your own scheduling. **However, each week your weekly discussion time will be synchronous and you should block time in your**

weekly schedule to log on to Zoom at your standard discussion time, Central Time Zone. If you cannot make this time due to being located in a very different time zone, or if you face any other significant barriers to meeting with your discussion section, please contact Dr. Bradbury and your TA ASAP.

Lectures will be conducted via Zoom and recorded. Students may either log on to the live lecture or access it later as a recording. **Two synchronous exams will be given during lecture time, Monday, October 12 and Monday, November 23.** Normally, lectures will only be broadcast and recorded one time per day, however exams will be offered for each Registrar lecture section (10 am and 12 pm on Mondays).

Finally, the last four days of class will be for group project presentations, and students will be required to not only give their presentation but attend at least five other presentations over the course of the four days. Scheduling for these will be pre-determined with student input.

All other assignments will be asynchronous with defined "start" and "due" times. Any assignments submitted after their "due" time without ***prior*** approval will be deducted 10% per day late. ***We strongly encourage you to attempt assignments as soon as you can once they are available so that you have time to solve any technical or other problems.*** We are unable to manage the class on a case-by-case scenario for each student, so poor time management will make this class very difficult.

Course Points Allocation:

Course credit will come from a combination of asynchronous, individual "homework" assignments, lecture engagement (either synchronous or asynchronous), the weekly discussion activities (synchronous), exams (synchronous), and final group project (flexibly synchronous). The points allocation for the course is as follows:

Assessment	Points
Homework Assignments	100
Lecture Engagement	100
Weekly Discussions	100
2 Exams @ 50 points each	100
Final Group Project	100
Total Points	500

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 an online office hours session.

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!

Attendance & Participation in an Online Environment:
I expect that all of my students are autonomous adults acting with agency in their own lives. You are taking this course because you want to learn. However, there are additional challenges to showing me that you are present and engaged in an online course. I can track student log-in data, though I prefer not to. Significantly more important will be your participation in online activities and synchronous discussions. **If there are any students who will be missing extended access to the course due to a University-sponsored event or religious observance, please notify Dr. Bradbury ASAP.**

Skills Needed for Success in an Online Environment:

Succeeding in an online environment requires very different skills than are required for success in a traditional in-person large lecture college course. Your ability to memorize facts or perform under pressure will only account for 1/5 of the course credit. However, your ability to **independently self-motivate**, **keep a schedule**, and **direct your own learning** will make the difference between success and failure. The course is structured with incremental deadlines to help you not fall behind and many opportunities for engagement with the teaching team. However, only *you* will be responsible for managing your time and asking for help!

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."