



**Biology 196/260-01**  
**Teaching Biology: Pedagogy and Practice**  
**Fall 2020**

**Instructors:**

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**Class meetings: Mondays, 10:30-11:45 AM, in person at 200 Boston Avenue room 4745**  
**Some of the class meetings may be virtual.**

**Textbook: Teaching at its Best, by Linda Nilson, 4<sup>th</sup> edition**

**What will we be talking about in this class?** What constitutes “effective” teaching in a biology class? What characteristics do “good” teachers share? Why do some students prefer taking multiple choice exams while others would rather work in a group to complete a semester-long project? How is science education changing with the COVID-19 pandemic? These questions represent a sampling of the questions that we will address in Bio 196/260.

The overall goal of this course is to provide you with a collection of “tools” that you can use while teaching biology in both lecture and laboratory settings. To do this, we will discuss a variety of topics, including course design and development, learning styles, diversity in the classroom, mentoring, conflict resolution, effective ways to lead discussions, active learning techniques, assessment (both formative and summative), and course evaluations.

In this class, you will: 1) learn about pedagogy, 2) be mentored by a team of faculty members and by your peers, and 3) gain practical teaching experience. Throughout the semester, you will also reflect upon your own teaching and learning experiences and apply metacognitive skills to improve your effectiveness as an educator.

**What are the course objectives?**

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

1. Lead effective class discussions that engage students in critical thinking.
2. Describe the major theories that have been proposed to describe how students learn science.
3. Identify practices that promote inclusion and participation for diverse groups of students.
4. Create learning goals and write student learning outcomes for a classroom topic/activity.
5. Distinguish between formative and summative assessment and apply each in your teaching.
6. Write effective questions and determine what skills they are testing using Bloom’s taxonomy.
7. Evaluate student assignments fairly and consistently using rubrics.
8. Describe pedagogical innovations that promote active learning, including cooperative learning groups, inquiry-based exercises, and student-centered activities.
9. Assess techniques that can be used to promote effective student/instructor interactions.
10. Create an effective teaching evaluation and utilize it to enhance your teaching.
11. Describe the pros and cons of using technology in the classroom and provide examples of how technologically enriched learning environments are changing science education.
12. Design a lesson plan for a given set of learning outcomes.
13. Identify resources for enhancing teaching in the science education literature.
14. Use metacognitive skills to enhance your teaching effectiveness.

## Bio 196/260-01 Course Topics

<b>Week #</b>	<b>Date &amp; Day</b>	<b>Topic</b>	<b>Reading/ Assignment due</b>
Week 1	Sept. 14	<b>Engaging students in your class</b>	Chapters 7,8,12,13 No assignment due
Week 2	Sept. 21	<b>How do students learn science?</b>	Chapters 1,2 Reflection: How do you learn science?
Week 3	Sept. 28	<b>Organizing lessons to maximize student learning</b>	Chapters 11 & 12 Lesson design
Week 4	Oct. 5	<b>Assessments</b>	Chapters 24,25,26 Writing effective questions
Week 5	Oct. 12	<b>Rubrics and evaluation</b>	Chapter 27 Grade a sample assignment
Week 6	Oct. 19	<b>Promoting inclusive teaching</b>	Chapters 22 & 23 Take implicit association test
Week 7	Oct. 26	<b>Using hooks to engage students</b>	Create your own hook
Week 8	Nov. 2	<b>Active learning techniques</b>	Chapters 14,15,16,17 Prepare for jigsaw activity
Week 9	Nov. 9	<b>Technology in the classroom</b>	Chapter 4
Week 10	Nov. 16	<b>Student/instructor interactions</b>	Chapters 9,10 Lesson revision, Description of a difficult classroom situation
Week 11	Nov. 23	<b>Teaching evaluations and letters of recommendation</b>	Chapter 28 Teaching evaluations survey
Week 12	Nov. 30	<b>Using the education research literature to enhance your teaching</b>	Find and summarize an education research article
Week 13	Dec. 7	<b>Class Wrap-Up</b>	

We will do our best to follow the course syllabus – however, we reserve the right to make modifications as needed during the semester.

## What resources do you have available?

1) **Canvas website** (<https://canvas.tufts.edu/>): Go here to view course announcements, lecture slides, reading assignments, the discussion board, and more. You should check the BIO196/BIO260-01 site frequently for announcements and helpful suggestions.

2) **The Textbook:** Teaching at its Best, by Linda Nilson, 4<sup>th</sup> edition. This is an excellent resource whether you're teaching your first class or have been practicing your craft for years. We will provide you with a .pdf version of the textbook.

3) **Individual meetings with Mitch and Kelly:** We encourage you to stop by our offices or drop by our Zoom office hours if you have questions or want to chat.

4) **Remote teaching observations:** Some of your teaching this semester will be in person in the lab and some will be virtual. We can't attend your in-person lab sessions due to COVID-19 restrictions, but we're happy to observe one of your virtual sessions if you think it would be useful. **This is an optional service.** If you do ask us to observe your class, please provide us with the Zoom link and a list of what you would like us to focus on in our observation.

If you would prefer that we don't visit your virtual classroom, that's fine. We are always available for consultations.

## How will your performance in this class be assessed?

<b>Grading:</b>	Attendance and class participation	50%
	Short homework assignments	25%
	Lesson design project and revision	15%
	Ten-minute teaching activity	10%

Attendance/Class Participation: Class attendance is required. As a matter of courtesy, if you have to miss a class we request that you please send us an e-mail to let us know that you will not be joining us. You are allowed to miss one class during the semester without a penalty. If you are absent, you are still required to turn-in any assignments that are due that day. If you miss more than one class, each additional unexcused absence will result in 5% deducted from your final grade.

Please be considerate of your professors and fellow classmates – plan to arrive on time. Arrivals after 10:45 A.M. will be counted as a missed class.



Reading Assignments: We will assign reading material from the textbook, in addition to occasional review articles and other handouts that will be posted on the course Canvas site. Since substantive contribution to classroom discussions will be a valuable component of this course, you should complete all readings prior to coming to class and be prepared to reflect upon them.

Short homework assignments: Each week, there will be a homework assignment designed to help set the stage for a particular class topic. Generally, you will be asked to write a short response to the reading or complete an activity that will prepare you for the class discussions. All written assignments are due at the beginning of class (10:30 A.M.) unless otherwise specified. No late assignments will be accepted. As mandated by Tufts policy on academic integrity, plagiarism or any form of academic dishonesty will not be tolerated.

Lesson design project: Mid-way through the semester, you'll have an opportunity to design a lesson for a topic of your choosing. Several weeks later, you'll revise your design, applying what you're learning in the class. We'll also engage in peer review to further improve the lessons.

Ten-minute Teaching Activity: The best way to figure out how to promote student participation is to practice. During the semester, each of you will be asked to lead a 10 minute discussion/mini-activity on a topic of your choosing related to biology and/or pedagogy. Further details about this will be provided on the first day of class.

Accommodations for Students with Disabilities: Tufts University values the diversity of our body of students, staff, and faculty and recognizes the important contribution each student makes to our unique community. Tufts is committed to providing equal access and support to all qualified students through the provision of reasonable accommodations so that each student may fully participate in the Tufts experience. If a student has a disability that requires reasonable accommodations, they should please contact the StAAR Center (formerly Student Accessibility Services) at [StaarCenter@tufts.edu](mailto:StaarCenter@tufts.edu) or 617-627-4539 to make an appointment with an accessibility representative to determine appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

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In-Person Classroom Health and Safety Policy: As you are aware, due to the COVID-19 pandemic the academic experience will be different for all of us. When physically in person for this course, you'll be responsible for wearing a mask that covers your mouth and nose, practicing physical distancing of 6 feet with other individuals, and keeping your desk and chair on the designated spots on the ground. You will also be responsible for wiping down your own desk, chair, and other frequently touched surfaces with alcohol wipes or other approved disinfectant upon arrival and departure from the classroom. You are also responsible for following the one-way directional patterns indicated by the signs in the hallways in academic buildings. It is imperative that we work together as a community to uphold these standards to help mitigate the risk of spreading the virus. Failure to do so may result in a referral to the Dean of Student Affairs Office. For more information about expectations for the Fall, please review the Fall Guide [here](#).