



Biology-260

Teaching Biology: Pedagogy and Practice

Fall 2009



Instructors:

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When and Where:

Thursdays, 5:45-8:30 PM, Barnum 201

(Bio260-02, Bio 13 lab prep)

Fridays, 10:30-11:30 AM, Barnum 113

(Bio260-01, for those who have not previously taken Bio260)

Course Description:

What defines '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? These questions represent a sampling of the topics that we will address in Bio 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 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.

Course objectives

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

1. Promote effective class discussions that engage students in critical thinking.
2. Identify various learning styles and adapt your teaching/mentoring to address as many styles as possible.
3. Create learning goals and write student learning outcomes for a classroom topic/activity.
4. Distinguish between formative and summative assessment and apply each in your teaching.
5. Write effective exam questions and determine what skills they are testing using Bloom's taxonomy.
6. Evaluate student work fairly and consistently using rubrics.
7. Describe pedagogical innovations that promote active learning, including cooperative learning groups, inquiry-based exercises, and student-centered activities.
8. Assess techniques that can be used to deal with conflict in the classroom.
9. Identify diversity issues in the classroom and implement teaching strategies to address these.
10. Create an effective teaching evaluation and utilize it to enhance your teaching.
11. Use metacognitive skills to enhance your teaching effectiveness.

BIO260 Course Topics

Week #	Date & Day	Topic	Assignment due	Bio13 Lab and Lecture notes
Week 1	Sept.10 (Th)	Introduction to Bio260-02, Prep for lab week 1		No BIO13L lab
	Sept.11 (F)	Introduction to BIO260-01, Promoting effective class discussions	none	
Week 2	Sept.17 (Th)	Prep for lab week 2, Enzymes lab I		Lab 1- Introduction to enzyme assays, data presentation
	Sept.18 (F)	Learning goals and outcomes	Homework: Reading and short response assignment	
Week 3	Sept.24 (Th)	Prep for lab week 3, Tools for peer editing		Lab 2 - Enzymes lab I
	Sept.25 (F)	Types of assessment (formative vs. summative), Grading rubrics	Homework: Reading and short response assignment	
Week 4	Oct.1 (Th)	Prep for lab week 4 Enzymes lab II		Lab 3- Calculations for Solutions and Enzyme Analysis
	Oct. 2 (F)	Summative assessment, Using Bloom's taxonomy to write exam questions	Homework: Reading assignment and Bloom's taxonomy survey	
Week 5	Oct.8 (Th)	No Prep		Lab 4- Enzymes II EXAM 1 on 10/8
	Oct.9 (F)	Dealing with difficult situations in the classroom	Homework: Submit by e-mail a difficult classroom situation	
Week 6	Oct.15 (Th)	Prep for lab week 5, Transformation lab		No lab this week
	Oct.16 (F)	Learning styles	Homework: Complete learning styles survey	
Week 7	Oct.22 (Th)	Prep for lab week 6, Gender testing case study		Lab 5 – Transformation Lab report 1 due this week
	Oct.23 (F)	Teaching with hooks: effective or distracting?	Homework: Create a hook for an assigned topic	
Week 8	Oct.29 (Th)	Prep for lab week 7, Genetics computer simulation		Lab 6 – Gender testing case study
	Oct.30 (F)	Active learning techniques that promote student involvement	Homework: Preparation for jigsaw activity	

Week 9	Nov.5 (Th)	Prep for lab week 8, Genetics wet lab		Lab 7- Genetics computer simulation
	Nov.6 (F)	Open week Topic to be determined		
Week 10	Nov.12 (Th)	Prep for lab week 9, Tools for promoting group work		Lab 8 – Genetics web lab EXAM 2 on 11/10
	Nov.13 (F)	Theories of teaching and learning; metacognition	Homework: Reading and short response assignment	
Week 11	Nov.19 (Th)	Prep for lab week 10, DNA diagnostics wet lab		Lab 9 – Antibiotics and bacterial growth simulation Lab report 2 due this week
	Nov.20 (F)	Education research: Using the literature to enhance your teaching	Homework: Find and summarize an education research article	
Week 12	THANKSGIVING BREAK			
Week 13	Dec. 3 (Th)	Prep: How to design an effective lab practical		Lab 10 – DNA diagnostics
	Dec.4 (F)	Teaching evaluations	Homework: True/false survey about evaluations	
Week 14	Dec.10 (Th)	No prep		Lab practical this week
	Dec.11 (F)	Bio 260 Wrap-Up		EXAM 3 on 12/10 FINAL EXAM on 12/15

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

NEED ASSISTANCE? A few important resources

1) **Blackboard website** (<http://blackboard.tufts.edu/webapps/login/>). Course announcements, lecture slides, reading assignments, discussion board and more. You should check the BIO260 site frequently for announcements and helpful suggestions.

2) **Weekly office hours** (times are posted on the BIO260 BB site). If you have questions – meeting with faculty can often help clarify any questions.

Course Requirements, Policies & Assessments

Grading:	Attendance	30%
	Class participation	30%
	Short homework assignments	40%

Evaluation for this course will be based on a combination of attendance, class participation, and short homework assignments. **All written assignments are due at the beginning of class (10:30 a.m.) in hardcopy unless otherwise specified.** No late assignments will be accepted. 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 the readings.

As mandated by Tufts policy on academic integrity, plagiarism or any form of academic dishonesty will not be tolerated.

General Course Requirements:

Class Participation/Attendance: In this type of class, participation during class discussions is imperative and therefore, class attendance is required. Students should come to class prepared, ask thoughtful questions, be organized and meticulous in your work, and contribute to the class discussions. Although attendance is mandatory, we understand that sometimes “life happens” (people get sick, or have a career-related emergency/opportunity). As a matter of courtesy, if you have to miss a class we kindly request that you please send us an e-mail (a.k.a. “drop-a-note”) to let us know that you will not be joining us. You are allowed to “drop-a-note” once during the semester without a penalty. Remember that if you “drop-a-note”, you are still required to turn-in any assignments that are due that day. After you have used your one “drop-a-note” class, each additional absence will result in 2% deducted from your final grade for each unexcused absence. (For example, if you miss 5 classes during the semester – and your total number of points earned was 95/100 points – your final grade will be 85/100 for the course because 10% will be deducted from your final grade for the 5 unexcused absences).

Please be considerate of your professors and fellow classmates – plan to arrive on time. Arrivals after 10:40 a.m. will be counted as a missed class.



Reading Assignments: There is NO textbook to buy for this class. We will assign reading material in the form of review articles, primary literature and other handouts that will be posted on the course Blackboard site for you to download or read online. It is your responsibility to obtain copies of the assigned material and read it prior to class.

Short homework assignments: Each week, there will be a short 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.