BIOL 604 Survival Kit for Scientists, Part One: Teaching Issues

Pass/fail grading

Meeting time & place: Wednesdays, 6-9 PM, S3-214


Why take this course? Graduate students do not receive much training in how to teach and most of their learning about teaching is by trial and error. The purpose of this course is to develop teaching skills more efficiently. Completion of this course will satisfy some of the requirements for Binghamton University's Certificate of College Teaching. Specifically, each student will complete a teaching portfolio. Increasingly job advertisements ask for evidence of teaching training and skills. Having taken this course and having a teaching portfolio will provide that evidence.

Tentative schedule:

27 Jan. Introduction*
3 Feb. Student learning (Chapter 1)
10 Feb. The lecture hour (Chapter 4)*
17 Feb. Conducting discussions (Chapter 3)
24 Feb. Teaching scientific writing*
3 March Cooperative learning exercises*
10 March In-class demonstrations & lab & field exercises
24 March Evaluating students (Chapter 5)*
7 April Grabbing your students' attention & inspiring them
14 April Planning a course (Chapter 2)*
21 April Advising students & resolving conflicts*
28 April Evaluating your teaching (TEACHING PORTFOLIO DUE!)
5 May Teaching for scientific literacy

* A panel discussion is planned for part of this evening.

Format of course:

We'll spend Wednesday evenings with panel discussions with faculty, videos demonstrating techniques, in-class development and practice of techniques, and lots of class discussion.

Requirements to pass course:
1) Adequate preparation for class meetings (completing reading and out-of-class assignments on time) (20% of grade)
2) Adequate participation during class (20% of grade)
3) Adequate completion of teaching portfolio* (60% of grade). The portfolio should contain the following:
   a) generic protocol of a lecture (can be tailored to your subdiscipline)**
   b) commitment to prepare & deliver an hour lecture within one year of this course)**
   c) generic protocol for conducting a discussion (can be tailored to your subdiscipline)**
   d) generic protocol for teaching scientific writing**
   e) development of a co-operative learning exercise**
   f) commitment to prepare & evaluate a lab/field exercise within one year of this course)**
   g) development of guidelines for evaluating students**
   h) generic protocol for teaching for scientific literacy**
   i) 250-word statement of philosophy of teaching and your teaching goals
   j) summary record of all teaching assignments to date (e.g., BIOL 115 - taught two lab sections per week with an average of 20 students per section, wrote and administered weekly quizzes, graded lab reports, attended 2-hour preparatory meeting with instructor and TAs weekly)

**  Note that we will spend class time developing many of the items for the portfolio.

Also, if you are preparing for Binghamton University's Certificate in College Teaching, you may wish to add other items to your portfolio to obtain feedback from the instructor. For example, you may wish to add a videotape of a "best practice" recitation, pre-lab or lecture, with a self-evaluation; representative samples of lesson plans, quizzes, examinations, assignments and handouts that you have prepared; and summaries of evaluations that you have received.

Assignments (reading & assignment to be completed BEFORE class):

3 Feb. - Read Chapter 1. Before class, describe your 'learning preferences' and 'learning strategies'. Ask a friend or sibling who is not a biology major for help with this next part. Explain to him/her what 'learning preferences' and 'learning strategies' are. Ask that person what his/her preferences and strategies are. You will probably find this of most interest if you ask someone who is arts or humanities-oriented as opposed to science-oriented. Write a comparison of your and his/her learning preferences and strategies. Bring this comparison (typed, 100-250 words) to class.

10 Feb. - Read Chapter 4. Before class, prepare a critique of teaching styles of three past (unnamed, high school/university) teachers. The critiques should be typed, 100-200 words per teacher and provide a thoughtful evaluation of strengths and weaknesses. At least one critique should focus on one of your best teachers and another should focus on one of the worst. Write these as if you were visiting the class and had to write a report to
the supervisor who would share your report with the teacher.

17 Feb. - Read Chapter 3. Before class, make a list of 5 or more generic questions to pose to students during laboratory investigations (e.g., as you move from group to group checking on their progress). Try to develop generic questions that require more than a 'yes' or 'no' answer. 'Generic' means that you could use these questions in a wide variety of lab situations. Bring two copies of your typed list to class.

24 Feb. - a) If you do not own a good writing guide for biology, buy one, read it, use it and refer your students to it! If you do own one, refresh your memory by reading it. Here are two good guides:


b) Develop a lesson plan to teach students how to write a good scientific essay of 500 words or two pages in length. Your lesson plan should be about one page. Number the parts or sections of your plan. On a second page indicate by letter the corresponding objectives and time during class allocated from each part or task. Assume you have a one-hour class period for this exercise. Bring a typed copy of these two pages to class.

   d) Develop two ideas for a cooperative learning exercise for the course for which you are or have been a teaching assistant. About 25-50 words each, typed.

10 March - Read Chapter 6. Before class, find two "How-to-do-it" articles in American Biology Teacher (journal is in Science Library). Complete an evaluation form for each article.

24 March - Read Chapter 5. Before class, write 5 multiple choice questions for the course for which you are (or have been) a teaching assistant. One question should illustrate the pitfalls of such questions, two should be of medium difficulty and two should illustrate thought-provoking questions. Write the answers on the back of the page. Indicate the pitfalls of #1, and why #4 and 5 are thought-provoking. Then on a second sheet, write three essay questions, one designed for a 50-word answer, a second designed for a 250-word (=one typed page) answer and a third designed for a 1000-word (=4 page) answer. Provide an outline of the answers on the back of the page. These should be typed.
7 April - Before class, describe the most attention-getting thing that an instructor ever did in a course you took, and then describe the most inspirational thing that an instructor ever did in a course you took. No more than 100 words for each description. Bring two typed copies of your descriptions to class.

14 April - Read Chapter 2. Before class, describe the 'structure' of 5 courses that you have taken or for which you have been a teaching assistant. The descriptions should be typed, 50-100 words per course and compare and contrast the course structures. You may wish to compare courses that you have liked versus disliked, or small versus large classes, or undergraduate versus graduate. Indicate which of these comparisons you are making.

21 April - Before class, read the case studies in the handout.

28 April - Your teaching portfolio is due!!


d) Imagine that you have been assigned to teach the biology portion of a general science education course required of all students in the university. The enrollment each term is 500 and a fourth of the course is devoted to biology (3 weeks, with two 1.5 hour lectures per week, or a total of 6 lecture periods). Outline your course plan, taking into account all that you have learned this term. Refer to any introductory biology text for help (e.g., Campbell's). Be creative! Bring your typed plan to class (about 2-3 pages).

Reserve reading in Main/Science Library:


Recommended reading:

Burns RH (1994) Helping students succeed at a creative writing assignment in the biological
Crockett DS (1983) Advising Skills, Techniques, and Resources. American College Testing Program, Iowa City, IA
Hill WF (1977) Learning thru Discussion. Sage Publ, Beverly Hills, CA
Walter LM (19??) Lifeline to the underprepared: successful academic advising. Improving College & University Teaching 30:159-163
Commitment Form for Lecture

I, __________________________, promise to develop and present a one hour lecture for the course ____________________________________________ within one year of this date __________________. I understand that I must keep this commitment regardless of whether I serve as a teaching assistant for this course. Only the instructor of BIOL 604, the Graduate Director or the 'co-signed instructor' may allow me to transfer this commitment to another course/instructor and that permission must be in writing and with the agreement of the new instructor.

Promisee _____________________________

Co-signed by instructor of that course ____________________________________

Make three photocopies of this signed form.

original to 'co-signed' instructor
copy to: my portfolio, instructor of BIOL 604, my advisor

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Commitment Form for Laboratory/Field Exercise

I, __________________________, promise to develop a laboratory/field exercise for the course ____________________________________________ within one year of this date __________________. I promise to contribute sufficiently so that the instructor of that course would consider me the author or co-author of the exercise. I understand that I must keep this commitment regardless of whether I serve as a teaching assistant for this course. Only the instructor of BIOL 604, the Graduate Director or the 'co-signed instructor' may allow me to transfer this commitment to another course/instructor and that permission must be in writing and with the agreement of the new instructor.

Promisee _____________________________

Co-signed by instructor of that course ____________________________________
Make three photocopies of this signed form. Original to 'co-signed' instructor and copies to: my portfolio, instructor of BIOL 604, my advisor.