

# Methods of Science Teaching

ESCI 6460 Fall, 2006

Location: Gwinnett University Center

Day and Time: Thursday, 5:15 -8:15 p.m.

Room: 1760

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In this methods course, you will learn the essential elements of planning, classroom management, teaching, and evaluation in the secondary science classroom. The course is organized around three major themes: (1) engaging students in active learning in science; (2) teaching science for all students; and (3) continuing to learn from your own teaching. Topics to be addressed include: classroom management techniques, how students learn science, teaching for conceptual change, planning science lessons, core instructional strategies, lab safety, teaching diverse learners, assessing students' learning, and assessing your own performance.

1. How can we create a positive learning environment for students?
2. How do adolescents learn science?
3. How can we plan instruction to actively engage students and present a variety of representations?
4. How can we teach so that all students may learn science?
5. How can science teachers continue to grow and improve their teaching?
6. What are the most effective ways to assess students' learning?

## Course Goals

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

- Demonstrate knowledge of the foundational skills necessary for planning, teaching, management, and evaluation in the secondary classroom.
- Demonstrate that you can effectively engage all students in actively learning science.
- Plan, set up, manage, and assess laboratory activities.
- Explain how students learn science and apply these ideas in lesson planning.
- Demonstrate that you can teach or plan to teach science to diverse learners.
- Demonstrate that you understand the cultural background of your students and that you can effectively communicate with them.

### Textbooks

1. Chiapetta, E. L., Koballa, T. R., & Collette, A. T. (2002). *Science instruction in the middle and secondary schools* (fifth edition). Merrill Prentice Hall, 2002. (To be used in both block classes)

2. Wong, H. K., & Wong, R. T. (1998). *The first days of school*. Sunnyvale, CA: Harry K. Wong Publications.

Book #1 is available at the bookstore. Number 2 can be purchased at local books stores or on line. Be sure to check on an educators discount.

### Course Requirements

The assignments for this course will be components of your professional portfolio. By choosing your own portfolio pieces, you may pursue areas of growth which are the most important to you, yet at the same time, develop the knowledge and skills to be certified in Georgia. Portfolios allow the learner to demonstrate what they know, to learn while they are being assessed, and to have some choice and creativity in demonstrating an excellent performance. The National Certification Board is now using portfolios, and we believe this is an excellent model of assessment for teacher certification. The basic idea is that we will present the Standards for Certification to you, and then you will design ways to provide evidence that you meet those Standards. The Standards that we are using are a synthesis of those written by the National Association for Teachers in Science and previous benchmarks developed by the Science Education Department at UGA.

Topics to be assessed: During the fall semester, you will be asked to satisfy the Standards in four areas: learning environment, planning, skills of teaching, and assessment. The Standards for each of these four areas are shown in the attached handout. Within each of these four topical areas you will provide *at least* one piece of evidence that you have attained the knowledge and skills to meet each of the Standards. Certain pieces of evidence will be standard for everyone (required items), while others will be at your discretion (student choice items).

Contents of the portfolio: You will need to purchase a three-ring binder for assembling your portfolio. The following items are required for the portfolio:

- title page and table of contents
- goals statement, including a minimum of five goals for the semester
- observations or reflections on teaching practices journal. Each week as you teach in your own classroom or observe other teaching, you will reflect on what you have seen or done on one specific aspect of teaching and learning. These notes will be used for class discussion and will be included in your portfolio.
- required and student choice items (see Grading Summary)
- “Brief Reflection Form” (approximately ½ to 1 page) for each item of evidence

- final reflective statement including: (a) your philosophy of teaching (some of you did this for another course; you may use the one you have already done, or you may modify it) and (b) a summary of what you have learned and how you have met your goals

How your work will be graded: There are five portfolio assignments that will be required for everyone. Each of these will be submitted and graded as the semester progresses. Grades will be based on the quality of the work as judged against a grading rubric. Elements of the rubric will be discussed in class, along with more details about the required assignments. There is one student choice to be completed as a group. In addition to the five required portfolio assignments and the student choice item, there will be a grade for the portfolio as a whole, taking into account the quality, thoroughness, and creativity of the items and the way they are assembled. A rubric for grading the whole portfolio will be distributed and discussed in class.

Grading summary:

| <b>Task</b>  | <b>Value</b>           |
|--|------------------------|
| Daily: class attendance, punctuality, participation in discussion threads and other daily activities | 15% (75 pts)           |
| Portfolio:   |                        |
| Observations or Reflections Log  | 10% (50 pts)           |
| Classroom safety plan  | 10% (50 pts)           |
| Classroom management   | 10% (50 pts)           |
| Sub-folder including lesson plans and materials for 3 days   | 15% (75 pts)           |
| Skills of teaching (Resource File)   | 10% (50 pts)           |
| Assessment Instruments   | 10% (50 pts)           |
| Student Choice: Group project  | 10% (50 pts)           |
| Holistic Portfolio Grade   | 10% (50 pts)           |
| <b>Total</b>   | <b>100% (500 pts.)</b> |

Grades: A= 90-100; B= 80-89; C= 70-79; D= 60-69

**This syllabus is a tentative course plan; changes may be necessary based on the needs of the participants.**