



# The University of Georgia

## ESCI 3450: Practicum in Science Education Fall 2008

### INSTRUCTORS:

Michael P. Mueller, Ph.D.  
Mathematics and Science Education  
The University of Georgia  
212 Aderhold Hall, Athens, GA 30602  
Email: mmueller@uga.edu

Jessie Morris, Graduate Assistant  
Mathematics and Science Education  
The University of Georgia  
212 Aderhold Hall, Athens, GA 30602  
Email: draper@uga.edu

Aris Cajjal, Graduate Assistant  
Mathematics and Science Education  
The University of Georgia  
212 Aderhold Hall, Athens, GA 30602  
Email: aris@uga.edu

### TIME:

Fall Semester  
Wednesday 8:00-11:00  
August 20 – December 3, 2008

Syllabus is subject to change depending on the dynamics of the class and instructors.

### COURSE MATERIALS:

Required Books--- Chiappetta, E.L., & Koballa, T.R. (2008). *Science instruction in middle and secondary schools*. Upper Saddle River: Merrill Prentice-Hall.

Required Materials--- Journaling Notebook w/ Lined Pages

Optional Resources--- American Association for the Advancement of Science (1993). *Benchmarks for science literacy: Project 2061*. New York and Oxford: Oxford University Press. Retrieved on July 29, 2008, from <http://www.project2061.org/publications/bsl/online/index.php>



National Research Council (1996). *National Science Education Standards*. Washington DC: National Academy Press. Retrieved on July 29, 2008, from <http://books.nap.edu/openbook.php?isbn=0309053269>

### COURSE DESCRIPTION:

In this practicum, you will interact with students and teachers in schools. The intent of this practicum is to allow you to experience science teaching and learning in diverse cultural and regional settings, in middle and high school classrooms. The will also enable you to test some of your developing understandings about students, teaching, planning, assessment, and the learning environment. The topics addressed in the practicum correspond with those in ESCI 4450/6450 and ESCI 4460/6460. While in science classrooms, you will observe, work with small groups of students, assist classroom teachers in many ways, and lead instruction. It is important to remember that while in schools and interacting with teachers and students, YOU ARE THE UNIVERSITY of GEORGIA. Please ensure that your actions reflect well on yourself and the University. Your time in classrooms should help you develop a better understanding of teaching.

#### ATTENDANCE POLICY:

This course is based on John Dewey's (1916/1966 *Democracy and Education*) philosophy that, "since growth is the characteristic of life, education is all one with growing; it has no end beyond itself. The criterion of the value of school education is the extent in which it creates a desire for continued growth and supplies means for making the desire effective in fact" (p. 53).

Attendance and participation in discussions and assignments are required for educational growth, however, it is recognized that students get sick. Two missed classes are permitted this session. BE ON TIME TO THE SCHOOLS. Arriving more than 10 minutes late or leaving schools early will be counted as an absence. More than two absences will result in your being dropped from the course.

#### ACADEMIC HONESTY:

The University of Georgia seeks to promote and ensure academic honesty and personal integrity among students and other members of the University community. In keeping with the University Honor Code and Academic Honesty Policy, each student is expected to do his/her academic work and to acknowledge fully any assistance and academic resources. All academic work must meet the standards contained in "A Culture of Honesty." All students are responsible to inform themselves about those standards before performing any academic work. Terms of this policy, resolution procedures, and consequences of violation are available at: [http://www.uga.edu/ovpi/academic\\_honesty/culture\\_honesty.html](http://www.uga.edu/ovpi/academic_honesty/culture_honesty.html)

#### REQUESTS FOR MODIFICATIONS:

It is policy of the University of Georgia to make reasonable accommodations for qualified individuals with disabilities. If you are a person with a disability and want to request accommodations to complete your course requirements, please make an appointment with the course professors as soon as possible to discuss your request. For information on documentation requirements, contact the office of Disability Services (2-8719).

#### CHEMICAL RIGHT TO KNOW TRAINING:

By August 25, please provide verification that you have completed the "Chemical-Specific RKT Training for Laboratory Personnel," provided online: <http://www.esd.uga.edu/rtkcs>

#### TORT LIABILITY INSURANCE AND SECURITY CLEARANCE:

By August 25, please provide verification that you have Tort liability insurance (covered by the College of Education) and security clearance for teaching in schools, provided online: <http://www.coe.uga.edu/students/precheck.html>

#### NOTES ON CLASS DISCUSSIONS:

This course welcomes a caring style with respect to conversation and interaction with peers. A caring style encourages paraphrasing of others' thoughts and asking questions as a way to offer interest and attentiveness. A caring style offers compassion when others are frustrated. A caring style offers support for ideas to obtain clarity prior to critique. A caring style monitors their time so that they are not monopolizing the conversation---allow quieter others to voice their positions. A caring style is responsible to others to ensure that the current topic is given enough attention. Contrasting views are also appreciated and help to clarify others' ideas---so offer contrasting views when appropriate but in a constructive and inclusive way that permits effective exchanges.

#### NOTES ON MEETING AT THE LOCAL SCHOOLS:

A professional style of dress is required for both men and women in the schools. Please use appropriate discretion when choosing to "dress down" for school spirit weeks and other events. Keep in mind that as you are observing the classroom, you are being constantly observed in the school, which has the potential to provide an excellent recommendation for employment, or not. Equally, if not more importantly, be early to the schools so that you have time to talk with the teachers prior to their students arriving. You are more likely to teach if you have time to converse. Take to the time to build a trusting relationship with the teacher by arriving early enough to class. That relationship will go a long ways with respect to the opportunities you have down the road.

## ASSIGNMENTS PROFICIENCY AND SUMMARY:

Assignment proficiency is meeting 90% of the required expectations for completing assignments (rubrics). Assignments may be re-completed to meet the proficiency requirements for this course.

The reading schedule, activities, and assignments rubrics will be negotiated with the class.

### *School Journal*

The school journal is to show that you have learned to reflect in-depth on your school experiences. The journal also provides a way for you to reference ideas gained through the interactions with teachers and students in ESCI 4450/6450 and ESCI 4460/6460, which enhance class discussion. You are encouraged to carry the school journal (Journaling Notebook w/ Lined Pages) with you at all times and jot down notes throughout the class experiences, and immediately after your classes. Document your experiences and reflections related to those experiences beyond a "book report". Keep track of science teaching ideas, materials, websites, and other resources that are new to you. In addition, keep track of your "daily practicum tasks," the kind and number of tasks completed. One entry for every Wednesday you are in the schools is the minimum for your school journal, but you are encouraged to talk with the teacher about other opportunities and journal those as well.

### Example of a Journal Entry:

Date 08/08/08 Mrs. Sandlewood, Room 43, Earth Science

First off, during the first part of the class, Mrs. Sandlewood talked with the class, asking them some questions about what they had done the previous few days. I thought about how this fits into the inquiry scale, and I realized that it was probably more teacher directed, as for the most part the students were simply responding to her questions. At the same time however, I began to think about how her questions fit into the Bloom's taxonomy diagram that we looked at in the text. I took note of her questions and then referenced the diagram and found that her questions covered several levels of the taxonomy, including knowledge, comprehension, and analysis. I'm not sure whether or not she was actively thinking about this, or whether she just sort of subconsciously does it because she's been teaching so long, or if there was even any thought to this at all, but it is definitely something that I was glad to pick up on. I hope that, whether consciously thinking about it or not, I can implement all of these different sorts of questions into my teaching. Along with this idea, I saw the formatted lab report that she has the students fill in, and I think it also covers many of the levels of the taxonomy diagram. She has the students do a variety of activities from defining a hypothesis, describing the results, and constructing/analyzing a graph. I would definitely like to talk more with her on this to see what her underlying thoughts are.

The second noteworthy thing today was a little activity that Mrs. Sandlewood did with the students. I don't think she required them to write anything down, just to work through it with her. She used an analogy of a car and how different forms of energy (topic of the week/chapter) are involved when the car cranks up and moves. She had a diagram that she put up on the projection screen and explained how when we think about driving a car we can also think about what forms of energy (mechanical, thermal, electrical) are helping us get to our destination. I think this was an excellent example of her considering the context of the students in her teaching. She knows that many of them work, and drive to work, and drive to school, so what better way to relate the concepts of energy that they have been talking about to their everyday lives. As a corollary to this, she also shared an article that she found on the internet about "dihydrogen monoxide" and "its terrible effects on the environment". I think she used this to tie in the fact that science isn't just about memorizing useless facts, but that being educated is important. If an uneducated person had come across such an article and had no idea that dihydrogen monoxide was simply water, then they would have probably been outraged, and possibly "donated money to the campaign" against its use. A sad state of affairs if everyone was so easily fooled.

Great teaching strategies!! I wonder what else she has up her sleeve...

### Daily Practicum Tasks:

1. Find the appropriate place to park in the school lot. Introduce yourself at the office as a future science teacher representing the University of Georgia. Always be patient and courteous, wear a smile, and comment positively about the school, students, and teachers. Your positive comments may make someone's day, it's infectious, and they will remember and look forward to your arrival each day.
2. "Sign-in" in the office upon your arrival, get a nametag, and "sign-out" when you exit the school. Remember that the principal is responsible for knowing at all times who is in the building.

3. Walk around the campus so you get to know more about the high school and middle school science areas, where the faculty restrooms are located, etc.

4. If one exists, consider visiting the faculty workroom to find out what goes on there. It is recommended that you not discuss politics or religious affiliation. For issues that involve the politics of the school remain neutral or quiet—you are a visitor and guest of the school, not a sounding board, mediator, or negotiator. Similarly, some of the teachers may use the faculty workroom to complain about colleagues or students. Avoid the discussion, but learn from what you hear.

Possible Practicum Experiences:

1. Make a sketch of the classrooms you are working in and learn the names of students. Do this the first day and memorize the names of students the first night. This is not only the first element of effective classroom management, but it shows the students that you care about who they are. Ask your teacher about how she/he prepares for the first day of school, introduces the year's work and classroom rules. What are the safety rules in the science classroom and how are emergencies handled, first aid, and fire extinguishers? Is students' work displayed in the classroom? If teachers are using a computerized system for record keeping, ask to see how it is done.

2. Conduct interviews with first-year teachers and ask them about the joys and challenges that they associate with their jobs. Write a report summarizing the teachers' responses and giving your opinion about whether you share their ideas about the joys and challenges of teaching.

3. Interview a science teacher who has served as the mentor for beginning teachers in the past. Ask the teacher about his or her expectations for a beginning science teacher in the areas of lesson planning, instruction, classroom management, and learning assessment. Prepare a report summarizing your findings and drawing conclusions regarding your own preparation for science teaching.

4. The National Science Teachers Association (NSTA) is the largest organization in the world committed to the advancement of science teaching. Access the NSTA web site [[www.nsta.org](http://www.nsta.org)] and check out its teacher resources, events for science teachers, and professional journals—*The Science Teacher*, for high school teachers, and *Science Scope*, for middle school teachers. Join NSTA as a student member.

5. Start a notebook of science teaching ideas and materials. Organize your notebook into sections (e.g., classroom environment, assessment, safety, demonstrations, etc.) and add your reflections regarding the usefulness of ideas and materials included.

6. Interview two students about their science learning experiences. In a paragraph, describe how their comments reflected the themes of scientific literacy: (1) science as a way of thinking, (2) science as a way of investigating, (3) science as a body of knowledge, and (4) science and its interactions with technology and society.

7. Gather instructional materials from a teacher that he or she uses to teach students about the nature of science. Compare the concepts taught by the teacher with those discussed by Dr. William McComas (<http://coehp.uark.edu/pase/TheMythsOfScience.pdf>) about myths of science.

8. Administer Chiappetta and Koballa's "Myths of Science" quiz to several teachers or students and then discuss their answers with them. Write a paragraph that describes their responses to the quiz and thinking about the nature of science. [The quiz is in the November 2004 issue of *The Science Teacher*, page 58-61 and on page 90 of your textbook.]

9. Draw a floor plan for a middle school or high school classroom that would facilitate quality science instruction and reduce the probability of student misbehavior. On the floor plan, show the location of students' and teacher's desk, student laboratory stations, safety equipment (e.g., first aid kit, fire blanket, safety shower, etc.), materials and equipment storage, chalkboard or overhead projector and screen, and doorways. Also draw lines to represent student traffic patterns.
10. Observe a science class taught by a veteran teacher and pay particular attention to how he or she addresses the areas of classroom environment, including interpersonal relationships, organization and management, and lesson design and teaching. Arrange to meet with the teacher after the class to discuss your observations. Direct the discussion to have the teacher talk about his or her reasons for the management decisions and strategies you observed.
11. Talk with a school principal or the assistant principal in charge of discipline. Ask about the school's disciplinary procedures and under what conditions it is considered appropriate for teachers to send students to the school office for discipline.
12. Select a concept or topic from a middle or high school science course that you believe students find boring. Develop a plan to teach the concept or topic in a way that will motivate students to be engaged science learners.
13. Interview two science teachers about their lesson assessment practices. Ask about alignment among standards, instruction, and assessment.
14. Develop a set of class rules that you would display in your classroom. Show the class rules to science teachers and ask what changes they would recommend. Write a paragraph that describes how you would introduce class rules to students. Include in your paragraph information about the level of student involvement in constructing the class rules.
15. Ask a veteran science teacher to assess his or her own lesson assessment practices using the checklist presented in Table 6.3 of the textbook. Discuss your own thoughts with him or her about lesson assessment and determine what changes he or she would suggest to improve the checklist and your own thinking about lesson assessment.
16. Interview two science teachers about the Georgia Performance Standards for the courses that they teach. Ask how they standards influence their teaching and student learning.
17. Show your map of the core concepts in the science discipline you plan to teach to veteran science teachers. Have them comment on your map and describe how a map that they might construct would be different from your map.
18. Talk with teachers about web sites and computer software that they consider valuable resources for teaching science. Explore one or more of the site or software packages. Describe in a paragraph how the sites or software could be used to help student learn science.
19. Ask teachers to allow you to examine curriculum units that they have developed. After examining the units, talk with the teachers about them. Ask about the vision and philosophy that supports the unit, the standards addressed in the unit, and how student learning of unit content is assessed.
20. Make arrangements to observe a lesson taught by a veteran middle or high school science teacher and to speak with the teacher after the lesson. Ask the teacher about the lesson's purpose, planning, instruction, classroom management, and assessment. Write a paragraph about your

experience in which you compare your thoughts about the lesson with those of the teacher. Share your paragraph with other beginning teachers.

21. Find out what resources are available for teaching science in a school. Also, check out the library/media center for science books, videos, etc. What is the annual science budget for science? Is the budget the same or different for other subjects?

22. Interview any two of the following school staff people to gain their perspectives of the school, their role in the lives of students and teachers, and why they enjoy their careers: office staff worker, cook, custodian, nurse, guidance counselor, security officer, bus driver, etc.

23. During one lesson observation make a seating chart and record the distribution of classroom discussion by making a tally of the way the period is spent. Your recording categories could be: discussion, worksheet assignments, group work, question-and-answer, student note taking, etc. Your tallies may reveal differences by gender, race, or room position. Write a paragraph that summarizes your observations.

24. Observe two lessons that are other than science. Carefully focus on the style of instruction. How do the lessons compare to science lessons? Based on your observations, what seems to make science lessons unique? Summarize your responses to the questions in a paragraph.

25. Request a copy of the year's syllabus for the classes you observe. Also, ask for some sample lesson plans and tests. Become familiar with the Georgia Performance Standards for the classes you observe.

26. Teach as often as possible. First consider team-teaching with a peer, your mentor teacher, or your university course instructors. Also, request to teach small groups of students. Then, try to teach a lesson or part of a lesson on your own.

#### TENTATIVE COURSE SCHEDULE:

August 20, 2008	Introductions and Syllabus Review Placement forms
August 27, 2008	1. Read Selected Pages of J.M. Cooper and G.D. Borich's "An Educator's Guide to Field-based Classroom Observation" Activities: Preparing for the Practicum in Science Education
September 3, 10, 17, 24	In Schools
October 1, 8, 15, 22, 29	In Schools
November 5, 12, 19	In Schools
December 3	In Schools 1. School Journals