

Syllabus for EDCI 266W & EGEN 296, Secondary Science & Agriculture
University of Connecticut
Fall Semester, 2005

COURSE OVERVIEW

Learning to teach secondary science is a challenging and deeply rewarding endeavor. This class will more formally start you on this adventure, but teaching science is more truly a journey than a destination. This course will help you learn the practical knowledge you will need in order to motivate your students and to teach science for understanding.

The class is structured around the notion of a “teaching cycle” and will use this framework to engage in the complexity of teaching science. The cycle itself however, is not complex. It considers the tasks of teaching science to consist of the following four parts.

- *Planning.* Teachers must decide what they are going to teach. To do this, teachers must first focus on what they want their students to learn and what they want them to be able to do in the classroom.
- *Teaching.* Teachers must put their plans into action. This includes finding ways to engage students in motivating and productive activities. These activities must provide the intellectual scaffolding necessary to learn science for understanding.
- *Assessing.* Teachers must determine what their students have learned and determining grades. But it also means learning to identify how students are making sense of their learning and how assessments can be used to improve the quality of an educational experience in addition to evaluating it.
- *Reflecting.* Teachers must inquire about their teaching. What went well? What might be changed to improve the educational experience for the students? How might goals, strategies and perspectives need be changed? What can be learned from these teaching experiences? Have *all* of the students in my class made adequate progress?

New Literacies

A second purpose of this course is to prepare science/ag teachers who are equipped to use online teaching and learning tools: 1) for their own professional development, and 2) to support pupil learning. To achieve both elements of this purpose, you will acquire knowledge and skill in:

- Knowing the challenges that online learning can pose to pupils learning science/ag,
- Accessing online resources for professional development and pupil learning,
- Using five online learning strategies for teaching and learning (*identifying problem, searching, evaluating, synthesizing, and communicating*),
- Understanding key online teaching strategies—such and *Internet Reciprocal Teaching*,

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- Designing lesson plans and activities that integrate online instructional models as key features,
- Familiarizing/defamiliarizing yourself and pupils with the online communication tools commonly used for teaching and learning (e.g., *email*, *web pages*, *TaskStream*, *Wikipedia*, *blogs*, etc.)

Evidence that these purposes have been achieved will be gathered from a number of sources outlined the following pages: surveys, in-class tasks, in- and out-of-class assignments, projects, a unit plan, and observations of class participation in discussion of course readings and pedagogical demonstrations.

COURSE ASSIGNMENTS, GRADING AND PARTICIPATION

This class has two primary components. Each of these must be completed successfully for you to pass the course. If you fail to complete either of these components, you will receive a grade of 0.0 or Incomplete.

- A. Class** -- meets Tuesdays and Thursdays, 1:00-3:00.
- B. Field** – 6 hours per week of arranged time in your field placement site starting Monday, September 12th and ending on Friday, December 9th, 2005.

ATTENDANCE POLICY

Attendance matters. It matters to me as your instructor and it matters to your peers who count on your support and feedback. Teacher candidates must generally be present and on time for professional commitments, including classes and field experiences. Teacher candidates must communicate with their instructor and their field placement mentor about any absences. Absences for which you have not pre-notified me or your field placement mentor or absences that we discuss together after the fact but cannot accept as valid become “unreasonable” absences. *More than two unreasonable absences may result in a 0.0 grade for the course.*

If you know you are going to miss a class, talk with me prior to that time. Help me understand why the absence is necessary. Also, make a plan to get the information from that class. If an emergency occurs, try to call me at the phone numbers above at your earliest convenience and leave a voice mail message.

In your field placement, discuss with your mentor how to best communicate about absences and emergencies. Remember that this is a professional relationship and a pro-active stance goes a long ways in building/sustaining relationships. Again, *more than two unreasonable absences (or absences you fail to make up) may result in a 0.0 grade for the course.*

ACADEMIC INTEGRITY

The University's academic code of conduct is posted on the website <http://www.dosa.uconn.edu>. I expect each of you to always turn in your own work that

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represents your own thinking. That does not mean that you cannot speak to other people about assignments. You can and should discuss your work with others – they likely have interesting and helpful ideas. Also, there is much information available on the internet that I expect you to make use of. This does mean, however, that you distinguish the ideas and words of others and your own. Use appropriate citation.

“Academic Misconduct in any form is in violation of the University of Connecticut Student Conduct Code and will not be tolerated. This includes, but is not limited to: copying or sharing answers on tests or assignments, plagiarism, and having someone else do your academic work. Depending on the act, a student could receive an F grade on the test/assignment, F grade for the course, or could be suspended or expelled.”

COURSE READINGS AND MATERIALS

- **REQUIRED TEXTS:**

Chiapetta, E. L., & Koballa, T. R. (2006). *Science instruction in the middle and secondary schools: Developing fundamental knowledge and skills for teaching*. Upper Saddle River, NJ: Pearson Prentice Hall.

Fay, J., & Funk, D. (1995). *Teaching with love and logic*. Golden, CO: Love and Logic Press

National Research Council (2000). *Inquiry and the National Science Education Standards*. Washington, D.C.: National Academy Press.

Wiggins, Grant, & McTighe, Jay (2005). *Understanding by design, Expanded 2nd Edition*. Alexandria, VA: Association for Supervision and Curriculum Development.

- **ON WEBCT / HANDOUTS / ONLINE:**

American Association for the Advancement of Science (1993). *Benchmarks for science literacy*. Available on-line at: <http://www.project2061.org/publications/bsl/default.htm>

Bruner, Jerome (1996). *The culture of education*. Cambridge, MA: Harvard University Press. Chapter Two.

Connecticut Bureau of Curriculum and Instruction Science Main Index Page.
<http://www.state.ct.us/sde/dtl/curriculum/currsci.htm>

Dillon, J.T. "Using Questions to Depress Student Thought." *School Review*. 1978: 87, 50-63.

Dweck, C. S. (1988). A social-cognitive approach to motivation and personality. *Psychology Review*, 95(2), 256-273.

Fulwiler, Toby. Writing to learn in subject matter courses.

Gallagher, J. & Parker, J. (1996). *Improving teaching & learning using assessment in middle school science*. East Lansing: MI.

Kohl, H. (1994). *I won't learn from you*. New York: New Press. (Excerpt)

National Research Council (1996). *National science education standards*. Available on-line at: <http://books.nap.edu/books/0309053269/html/index.html>

Palmer, P. (1998). *The courage to teach*. San Francisco: Jossey-Bass. (Excerpt)

HIGHLY ENCOURAGED PROFESSIONAL MEMBERSHIP SUBSCRIPTION:

One of the hallmarks of a professional is participation within a community. As teachers of science and agriculture, there are a number of choices that can provide immediate benefits to education students. Such benefits include:

- Provides you access to subject-specific resources and the latest ideas about teaching and learning in your field of study.
- Gives you access to online versions of many professional resources.
- Membership in a professional organization tells prospective employers that you are already started as a professional science or agriculture teacher.
- It's really fun to learn about teaching from others who are doing the same. Eventually, you might contribute your own ideas!

For each of the major subject areas, the following are associations to consider:

Biology: The **National Association of Biology Teachers** (NABT) publishes the journal *The American Biology Teacher*. Student membership \$35.

<http://www.nabt.org/>

Chemistry: The **American Chemical Society** (ACS) publishes the *Journal of Chemical Education*. Also a journal called, *The Chemical Educator*, might be of interest.

<http://divched.chem.wisc.edu/index.html>

<http://chemeducator.org/>

Earth Science: The **National Earth Science Teachers Association** (NESTA) publishes the journal *The Earth Scientist*. \$15 a year (4 issues)

<http://www.nestanet.org>

Agriculture: **FFA** is the flagship organization for agricultural education.

<http://www.ffa.org/>

Physics: The **American Association of Physics Teachers** (AAPT) publishes the journal *The Physics Teacher*. Student membership \$22 (for online access).

W COURSE CRITERIA

Some of you may be thinking that having a science/ag methods course as a mandatory W doesn't make sense. After all, if writing is the focus, you would have become an English teacher☺ Well, let me share with you the perspective that I have on this question: first of all, I believe that writing is very hard work. Second, I think I know why—because writing is really the result of very careful thinking. A **central** goal of this course is for you to learn how to think about the complex issues and challenges of being a professional teacher. Writing is the way for you to say, “exactly what you mean,” and

the way you will also, in the process, learn what it is you want to say. More on this as the course progresses.

Based Upon the Formal Criteria from the University:

1. Students are required to write a minimum of fifteen pages that have been revised for conceptual clarity and development of ideas, edited for expression, and proofread for grammatical and mechanical correctness;
2. The course will address writing as a process, require revision, and provide substantial supervision of student writing. (The structure of revision and supervision may vary, including in-class writing workshops, individual consultation, substantial formative commentary on drafts, and so on.);
3. The explicit relation between writing and learning in the course will be evident;
4. The structure of supervision of student writing will be articulated;
5. The place and function of revision will be explained in the course;
6. How the page requirement will be met will be described;
7. All students must pass the writing component in order to pass EDCI 266W.

(Additional information about guidelines online at: <http://www.geoc.uconn.edu/geocguidelines.htm>):

ASSIGNMENTS AND GRADES

Assignments are listed below. Complete descriptions will be provided and discussed as we move through the term. Though grades will be reported separately as below, the two courses work synergistically with each other. Therefore, activities in each class are used and drawn upon for assignments and experiences.

EDCI 266W		EGEN 296	
5%	metaphors for teaching essay	30%	Case studies of students (2)
5%	management & safety plans	30%	Field memos (3)
5%	reflection-on-teaching paper	30%	Placement mentor evaluation
5%	participation	10%	participation
10%	2 analytic memo's. understanding in science, diversity & differentiation.		
10%	Teaching portfolio		
20%	2 lesson plans		
20%	1 unit plan		
20%	Inquiry Curriculum Box		

COURSE SCHEDULE (SUBJECT TO REVISION)

Date	Topic	Reading Due	Assignment Due in Class/Field
8/30	Introductions & P.T.A.R. surveys for New Literacies and subject matter		SM tasks and New Literacies Survey
9/1	Teaching Science in age of technology: new literacies	Science Instruction in the Middle and Secondary Schools (SIMSS). Chapter 1.	Metaphors for Teaching essay
9/6	Models of Understanding	Understanding by Design (UbD). Chapters 1, p. 13-35.	
9/8	The Private Universe: Misconceptions research in science education	UbD: ch. 2, p. 35-55.	Understanding in science memo
9/13	Learning in school placements: Observation	SIMSS. Ch. 3 & 4.	9/12: First day of placement
9/15	State Standards: CT	UbD: ch. 3, p. 56-81	
9/20	Learning cycle I		Field memo 1
9/22	Learning cycle II		Lesson plan 1
9/27	Learning science and reasoning with data I.		
9/29	Assessment	UbD, Ch. 7 Thinking like an Assessor. Gallagher & Parker	Student case study 1
10/4	Using labs effectively	Inquiry and the National Science Education Standards	
10/6	Making good explanations		Field memo 2
10/11	Learning science and reasoning with data II		
10/13	Technology in science teaching	SIMSS ch. 15	Lesson plan 2
10/18	Designing clinical interviews		

10/20	Asking questions and leading discussions	Dillion, J. T.	
10/25	Safety in science classrooms	SIMSS ch. 14	
10/27	Reading, writing and vocabulary in science.	Fulwiler	Reflection on teaching memo
11/1	Inquiry in Science	Inquiry and the NSES	Student case study 2
11/3	Learning from students	Readings from Love and Logic	
11/8	Managing a science learning community	Readings from Love and Logic	Unit plan check
11/10	Motivation to learn in science	Dweck	Inquiry box check
11/15	Equity and science teaching/learning	Kohl (excerpt)	Diversity memo
11/17	Teaching for Understanding	UbD, Ch. 10.	Unit Plan due
11/22	Thanksgiving recess		
11/24	Thanksgiving recess		
11/29	Managing a science learning community		
12/1	National standards and teaching science	Benchmarks (online) and NSES (online)	Inquiry Box Due
12/6	Intern-panel: preparing for student teaching in science		Portfolio check
12/8	Preparing for student teaching		Field memo 3 12/9 last day of placement
12/13-17	Finals week		Teaching portfolio due.

NOTES: