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C&I 426.01: Teaching Science in the Middle and Secondary School

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Teaching Science in the Middle and Secondary School
C&I 426

School of Ed 112 - Tuesday and Thursday- 9:00-12:00

Instructor: Fletcher Brown,
Office: 106 School of Ed Building
Office Hours: TBA

Textbooks: Teaching Secondary School Science by Trowbridge & Bybee
National Science Education Standards

Goals

The goal of this course is to help prepare you to teach science in the middle and secondary school. After completing this course, you should be able to:

1. Describe appropriate science concepts, processes and attitudes to be included in the middle and secondary science curriculum.

2. Select appropriate materials to support secondary science instruction.

3. Plan effective science lessons for middle and secondary science students.

4. Deliver effective science instruction to secondary school students using a variety of teaching methods.

5. Discuss current problems and issues related to secondary school instruction in an informed manner.

6. Develop the ability to be reflective about teaching, education, students, and the entire educational process.

Attendance

You are expected to be in class on time and for all class meetings. This is your education; get the most out of it.

Assignments

1. Word-processed assignments are mandatory.
2. Submit work on or before the due date to receive credit for your work.
3. Submit high quality, thoughtful assignments only.

Other Important Information

1. Be flexible; the syllabus might change in order to serve your needs in a more helpful, efficient manner.

2. Be in contact with me if anything related to the class is unclear or if you need further assistance.

3. Be sure to "Go the Extra Mile" in everything you do for this course. We need EXEMPLARY science teachers in our schools that go the EXTRA MILE. So, begin now.

Syllabus

Regular Class and Field Experience Meetings: The methods course work and field experience will be divided into three sections. The first section of class (9/3-10/31) students works in class developing an understanding of what good science instruction is composed of. This includes readings and participation in inquiry oriented instruction, cooperative group learning strategies, integrating math and science content and pedagogy, and the use of appropriate form of technology in teaching. Along with the classroom meetings students will begin their second field experience, meet their teacher, and become comfortable with the students and the classroom-learning environment. *The second section of class* (11/1-11/28) students will be completely immersed in their field experience and **will not meet** in class during regular meeting times. E-mail journalizing will be used to focus student's field experience on important themes identified in class or the text. Students will also teach their integrated unit in their respective middle or high school. *The third section of class* students will again meet at the regular class meeting time at the University using their experience in the field as a basis to refine their teaching practice Students will present their integrated unit to the rest of the class and complete the remaining requirement in their class portfolio

Integrated Math/Science Meetings: When possible during the first and third sections of class the math and science methods classes will meet together and complete investigations modeling integrated math/science teaching. After the investigations students and instructors will deconstruct the investigations identifying the unique and overlapping content and processes for both disciplines and the pedagogical approach used in the investigation.

Integrated Whole Group Meetings: The Social Studies, Business, Math, and Science methods classes will meet a number of times throughout the semester both during regular classroom meeting times and several evenings. The focus of these meetings is for interdisciplinary groups of students to meet and develop an integrated teaching unit to be taught in the schools during your field experience.

Student Evaluation

The assessment of your performance in this class will be based on the assignments described below. At the end of the semester you will be expected to create and hand in an assessment portfolio which brings together each of these assignments for a final evaluation. Below is a brief description of each assignment. Further description of each assignment and the assessment portfolio will be given in class.

Journal - You will be asked to record your own thoughts and reflections from your field experience in this course. You be required to make one journal entry each week you are in the classroom on e-mail with two other students in the class as well as the instructor. You are also responsible to respond to other student e-mail journal entries, giving comments, questions, and reflections.

Teaching Episodes – You will team teach three different times in class and be evaluated by fellow students and the instructor. The first teaching episode will not be used for your evaluation in class but the second two will be. The guide for evaluating your teaching will be described in more detail in class.

Thematic Interdisciplinary Unit - -You will be teamed with methods students from math, science, and business and expected to develop a minimum of a one-two day teaching unit to be taught in your field experience C&I 301/302 during the last two weeks of November. This unit should include an

appropriate theme, a rationale, unit goals, two lesson plans, appropriate technology, an assessment scheme, and reflection on the implementation of the unit. Due December 3th.

Year Long Curriculum Course and Sequence - You will be expected to develop a yearlong scope and sequence for the subject you expect to teach. The scope and sequence should include a central theme, a conceptual framework, model both national and state standards, and incorporate appropriate forms of technology and instruction pedagogy.

Educational Philosophy – You will be asked to write a one page educational Philosophy which you should eventually include in your teaching portfolio.

Resources – Identify and collect 10 different classroom activities you plan on using in your classroom. In addition create a bibliography and if possible collect a minimum of 20 resources for you to use, as a science teacher (no more than 1/3 of them can be from the Internet).

Readings Assignments/Participation- You will be expected to complete all readings and associated assignments and participate in discussions involving the chapter readings and articles given in class. You are also expected to be in class actively participating in discussions and activities.

Grades

Each assignment will have a certain number of factors, which will be assessed using a set of criteria (See sample below for an example of criteria used). The number of factors measured in each assignment are as follows: Journalizing 4; Teaching Episodes – 2; Integrated Thematic Unit 4; Year Long Curriculum Course and Sequence 4; Educational Philosophy 2; Resources 2; Participation 2 (1 for Attendance, 1 for student evaluation) Total: 20. The specific factors measured will be assigned prior to the assignment being initiated and often times developed by the students in class.

Your final grade will be determined by the following. A number score will be given to each criteria (4-excellent, 3-good, 2-needs work, 1 lacking) and summed for all 20 factors. Grades will be based on the following:

70-80 - A
60-70 - B
50-60 - C
40-50 - D

Keep track of your work and evaluations in your portfolio as the semester goes along. This portfolio will have six sections; one representing each area being evaluated listed above (Not including reading assignments/participation). In each section there will be three parts; the assignment requirements, evidence collected for the assignment, and the evaluation given for the assignment. At the completion of the semester you will be asked to hand in the assessment portfolio and a grade will be given to each student based on the above grading scale accompanied with a written narrative summarizing the students work throughout the semester.

Syllabus

WK	DATE	TOPIC
1	Sept 3	Introduction: Why do we teach? What is Science Teaching
	Sept 5	*First Teaching Episode*
2	Sept 10	What is learning in science? Inquiry & Conceptual Change (Business/Math/Sci. Methods Meeting)
	Sept 12	**In the Field**
3	Sept 17	Creating Effective Science Learning Environments Part#1 (Integrated Math/Science Methods Activity)
	Sept 19	**In the Field**
4	Sept 24	Creating Effective Science Learning Environments Part#2
	Sept 26	**In the Field**
5	Oct 1	*Second Teaching Episode*
	Oct 3	**In the Field**
6	Oct 8	Process Skills/Affective Domain (Bus./Math/Sci. Methods Meeting)
	Oct 10	**In the Field**
7	Oct 15	Science Education Curriculum (Integrated Math/Science Methods Activity)
	Oct 17	MEA Conference (**In the Field**)
8	Oct 22	Assessment in Science Education (Business/Math/Sci. Methods Meeting)
	Oct 24	**In the Field**
9	Oct 29	Assessment in Science Education
	Oct 31	**In the Field**
10	Nov 5	**In the Field**
	Nov 7	**In the Field**

11	Nov 12	**In the Field**
	Nov 14	**In the Field** (Integrated Unit Teaching)
12	Nov 19	**In the Field** (Integrated Unit Teaching)
	Nov 21	**In the Field** (Integrated Unit Teaching)
13	Nov 26	**In the Field** (Integrated Unit Teaching)
	Nov 28	**Thanksgiving No Class**
14	Dec 3	Integrated Unit Presentation (Integrated Math/Science Methods Activity)
	Dec 5	Education Technology and Science
15	Dec 10	Research in Science Education (Integrated Math/Science Methods Activity)
	Dec 12	Teacher Resources/ Special Topics
16	Dec 17	Final Exam/Presentations