



**AED 496D/596D Syllabus  
Teaching Science and  
Mathematics through Inquiry**

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**Course Description:**

This seminar course will provide a comprehensive introduction to teaching science and math through inquiry. The seminar will consist of team taught sessions that include student and instructor presentations, active learning exercises, and discussions.

**Course Objectives:**

Students will develop teaching, learning and communication skills while gaining an understanding of the K-12 school environment, student competencies, the content-related needs of teacher partners, and methods for meeting some of those needs. Students will learn how to be an effective resource to facilitate high quality instruction in the classroom. In addition, this course will serve as a foundational course for the UA CATTS Fellows Program.

**Required Materials:**

The instructors will periodically provide reading material for the class

A healthy and productive partnership depends on respect for and understanding of the needs, background and interests of all parties involved. The relationship between a teacher and student is a partnership for learning. In this class, you will learn about being both an effective teacher and learner.

The workshop will consist of a mix of sessions that include student and instructor presentations, active learning exercises, and discussions. You will develop an understanding of the K-12 school environment, student competencies, the content-related needs of your teacher partners, and methods for meeting some of those needs. You will learn how to be an effective resource to facilitate high quality instruction in the classroom. Through readings, discussions, focused classroom observations, guest speakers and inquiry-based activities, we expect that you will develop an understanding of the following:

1. Your role as a technical professional in the schools
2. State and National science education standards, state testing, and other mandated programs
3. Questioning techniques and methods of inquiry-based instruction
4. Assessment strategies
5. Classroom management and general school district policies

**Expectations:**

Throughout the semester you will be expected to actively prepare, for, and participate in classroom activities. There will be discussions related to reading material and lectures. You are expected to be prepared and to actively participate. Students who are taking this course for graduate credit will be expected to take a lead in developing discussion topics in class.

To put the theory learned in this class into action, each student will also visit schools three times to observe teaching and another three times to teach or participate in teaching a lesson. Finally, each student will keep a journal in which they record thoughts, ideas, reflections on the readings, activities and work conducted this semester. The journal will be turned in on or before the 1<sup>st</sup> of the month beginning on Feb. 1, 2008. They will be submitted by email

to Nancy at [nregens@email.arizona.edu](mailto:nregens@email.arizona.edu) if you are a CATTS fellow or to Kathleen at [krwalker@ag.arizona.edu](mailto:krwalker@ag.arizona.edu) if you are a BioME fellow.

### **Course Methodology and Teaching Format:**

This class will meet one day a week (Tuesdays) from 3:00pm to 4:50pm in Forbes Room 230. Each week fellows will be engaged in the teaching and learning environment. Fellows will be asked to participate and facilitate class discussion, as well as complete reading assignments and in class activities. In addition, fellows will be asked to turn in reflections and monthly journal entries.

### **Attendance Policy**

Students will be expected to attend each Tuesday session. Attendance is critical for the success of each GK-12 Fellow. Formal attendance will be taken in this course and an attendance form will be available for students to sign-in at the beginning of each class. A maximum of (2) two absences will be allowed as students must be in attendance to satisfy fellowship and course requirements. Fellows should notify the instructors in advance should an absence be necessary.

### **Enrichment Activities:**

A variety of reading assignments, in class activities, and reflections, as well as monthly journals will be required through out the semester. In addition guest speakers will be attending our course and fellows will be required to observe teaching and learning in the classroom by visiting, observing and teaching/co-teaching in K-12 classrooms throughout the semester.

### **Grading Policy:**

Grades will be awarded as Pass/Fail for this course.

Grades will be posted for students following the Confidentiality of Student Records guidelines <http://www.registrar.arizona.edu/ferpa/default.htm>

### **Office Hours:**

Office hours will be maintained throughout the course. The specific times will be posted on Dr. Knight's office door at the beginning of each week with a sign-up sheet attached. In addition, he may be contacted via phone or email. To see Nancy or Kathleen a Fellow should call or email them for an appointment.

## KEEPING A JOURNAL

The main purpose of your journal is to provide us with candid and thoughtful feedback on your experiences while participating in this workshop and the GK-12 fellowships. Your journal must include two components:

1. a brief summary of your thoughts and reflections on each weekly workshop with an emphasis on how it will affect your experiences as a GK-12 Fellow or in other teaching situations; and
2. writing about anything that is relevant to being an educator/teacher

For example, you might share how a positive (or negative) comment by one of your students affected you. Or, you might run across an article or quote in the newspaper, a magazine or book that inspires and motivates you with respect to your teaching. Record this cerebral and/or emotional encounter and share your thoughts on it. It should document the type of activities you are engaged in, your reflections on the impact of those activities, and your growth as a teacher.

Be creative and perceptive in your thoughts and observations. Each journal should be unique to its creator. Only the instructors and project evaluator will read the journals. The evaluator is looking for common themes and trends that will be reported in our annual and final reports.

The journals are due on the first of every month beginning February 1, 2008. Please submit them via email to Nancy [nregens@email.arizona.edu](mailto:nregens@email.arizona.edu) if you are a CATTS Fellow or to Kathleen at [krwalker@ag.arizona.edu](mailto:krwalker@ag.arizona.edu) if you are a BioMe Fellow.

## OBSERVING TEACHING and LEARNING in a K-12 CLASSROOM

Due By: April 15, 2008

During this semester, you are required to observe teaching in a K-12 classroom in preparation for teaching part or all of a lesson in that same classroom. The purpose of this assignment is for you to learn more about how teacher behavior and lesson design impact student learning and behavior. Hopefully, you will also gather ideas to improve your own teaching. You must observe a lesson and write a brief summary of your observations.

Prior to the observation:

Speak with the teacher and/or Fellow to let them know what you plan to observe during the class time. Also, when possible, ask for a copy of the lesson plan so that you can better prepare for observing. When entering a school building always check in the front office and sign in as a visitor.

During the class observation:

1. Focus on the teacher while they introduce the lesson and get things started. In your observations of the teacher, answer the following questions:
  - a. How does the teacher introduce and motivate the particular activity?
  - b. How effective was the technique?
2. When the students begin their work, focus on one student for 3-5 minutes, record your observations, then focus on another group or student and do the same. Do this for 3-5 students over the course of the lesson. In your observations of the students, answer the following questions:
  - a. Is the student conceptually engaged?
  - b. How do you know?
  - c. Give an example of a comment or question posed by the student that indicates whether they are on task and engaged or not.

3. After focusing on several students, watch the teacher for 10 minutes. Focus your attention on answering the following questions:
  - a. What does he/she do during the time students are working?
  - b. Write examples of the comments she makes to students.
  - c. Write examples of the questions he/she asks.
  - d. What seems to be the teacher's goal of his/her teaching methods?

### **After the observation:**

Thank the teacher for allowing you to observe the class. You may want to briefly tell the teacher what you learned from the experience.

### **What to turn in:**

1. A written summary of your observations should specifically address the questions above. Also, indicate any teaching tips learned from observing the teacher.
2. A copy of the lesson plan if provided. This may not always be possible. Many experienced and master teachers have their lesson plan in their head and not on paper. Try to get them to write them down for you.

## **Teaching in the K-12 Classroom Assignment**

**DUE BY: April 29, 2008**

During this semester, you are required to actively participate in teaching on three occasions in a K-12 classroom of your choice. If you need help identifying a classroom or teacher to work with, please contact the instructors and they will assist you. For one of the three lessons, you must be fully in charge of the activities and classroom. The other two you may simply be assisting the teacher or your partner. You may work with a partner on the teaching but each individual must have clearly identified teaching roles. If you teach the same lesson twice with your partner, you must switch teaching roles for the second teaching experience. You may use the same lesson with two different groups of children for the two teaching dates.

### **Prior to your teaching assignment:**

If you would like to go over your lesson plan with an instructor please contact one of them.

### **After you have done your teaching in the classroom:**

Revise the lesson plan and incorporate any ideas or lessons you learned from the teaching experience.

### **Teaching a lesson to our Fellows**

Each fellow and a partner must teach a 30-min. lesson to the group. Sign up for the date of your lesson. Dates for the lessons are the last four classes of the semester. There will be constructive feedback given after the lesson.