SCIENCE
TE801/TE803

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Course Description

Strand: Elementary Science

Standard: All teachers will examine the interrelationships among standards, instruction, and assessment to improve student achievement in science:

Benchmarks:

1. Develop positive attitudes toward the teaching of science as it relates to inquiry about the everyday world.
2. Understand the purpose of standards and how they can improve student learning.
3. Develop an understanding of the inquiry model of teaching science.
4. Investigate assessment alternatives that are aligned with standards and instruction.
5. Explore how the Internet can be used effectively to support inquiry-based teaching, learning and assessment.

NSES Teaching, Inquiry and Assessment Standards for this course will be discussed in class.

TEACHING FOR UNDERSTANDING

The Teaching for Understanding model will be used as the framework for teaching and learning in this class. It is a distinct method of teaching and learning, rooted in a specific way of looking at and explaining the world. Teaching for Understanding begins with the assertion that knowledge is constructed. This means that people shape, form, or "construct" their own worlds. People determine what is "real" and what is "necessary," and what has meaning. In Teaching for Understanding, teachers and students change the ways in which they approach information, each other, and the learning experience. No longer "fountains of knowledge and information," teachers are called on to be learners in their own classrooms. No longer "empty vessels" of passive receiving, students are called on to be teachers of self and others. Cooperative relations among students and an interaction relationship between students and the instructor are a means for students and the instructor to construct knowledge. Teaching for Understanding includes the following approaches to discourse and social interaction. Classrooms are places where:

• Students and teachers acquire and construct knowledge collaboratively.
• Orthodoxies of pedagogy and "facts' are continually challenged.
• Conceptual understanding of subject is the goal.
• Teachers function as guides, coaches, and facilitators by posing questions, challenging thinking, and leading in the examination of ideas and of relationships between concepts and experience.

Based on the Teaching for Understanding model, this course will promote active student learning and the construction and development of knowledge through lectures, readings, videos, computers, small and large group discussions, small group activities, and lesson plans that require the application of knowledge.

DATE	TOPICS	ASSIGNMENTS	ASSIGNMENTS DUE
SESSION 1	- Overview of Course - What are Standards? - What are the NSE Teaching Standards? - What is Inquiry Science? - What are Science Process Skills?	- Construct a concept map of the interrelationships among standards, instruction and assessment. - Read pages 18 – 35 (Chapter2) (Inquiry in the Content Standards) in the textbook: Inquiry and the National Science Education Standards.	*Questions from reading assignment.

SESSION 2	- What are the Michigan Science Standards and Benchmarks? - What is a Learning Cycle? - What are Testable Questions? - How Does Standards-Based Inquiry Science Look and Feel in a Real Classroom? - What are the Elements of Standards-Based Science Inquiry Lesson Plan?	- View and discuss video of an inquiry lesson in a kindergarten classroom. - Read pages 75-85 (Chapter 4) in textbook: Inquiry and the National Science Education Standards	*Questions from reading assignment.
SESSION 3	- What are Some Web Sites That Can be Used as Resources for Teaching and Assessing Standards-Based Inquiry Science? - What are Some Effective Strategies for Assessing Inquiry Standards-Based Science in the Classroom?	- View and critic Assessment video. - Read Chapter 9 in textbook: Elementary Classroom Management.	- Critic of video due - Student independent activity for lesson plan.
SESSION 4	- What is a Rubric? - What are the Steps in developing a Rubric?	- Develop a rubric. - Read Chapter 10 in textbook: Elementary Classroom Management.	Cooperative activity for lesson plan.
SESSION 5	- How Can the Needs of a Diverse Student Population be Met in a Standards-Based Inquiry Science Classroom? - How Can Inquiry Science Skills and Knowledge be Integrated into Other Curricular Areas?	Do an investigation that illustrates how the diverse needs of students can be accommodated in an inquiry science lesson. Develop activities from other subjects that can be integrated into investigation.	Lesson Plan Due Journals Checked

*A list of questions and/or assignments for the readings is in this syllabus.

Rubrics for assignments will be distributed prior to their due dates.

Protection of Scholarship and Grades - The principles of truth and honesty are fundamental to the educational process and the academic integrity of the University: therefore, no student shall: "claim or submit the academic work of another as one's own; procure, provide, accept or use any materials containing questions or answers to any examination or assignment without proper authorization; complete or attempt to complete any assignment or examination for another individual without proper authorization; allow any examination or assignment to be completed for oneself, in part or in total, by another without proper authorization; alter, tamper with, appropriate, destroy or otherwise interfere with the research, resources, or other academic work of another person; fabricate or falsify data or results."

THE INSTRUCTOR RESERVES THE RIGHT TO MODIFY AND/OR CHANGE TOPICS AND ASSIGNMENTS WITH NOTIFICATION OF STUDENTS PRIOR TO CHANGES.

Your grade for the science seminars will count for one half of your grade for TE801 or TE803 and will be based on the following:

1. **Attendance – 20 points***
2. **Journal – 15 points**
3. **Critics of Video – 5 points**
4. **Reading Assignments – 20 points**
5. **Lesson Plan – 40 points**

***Attendance and Punctuality**
You are expected to be present and on time for your science classes. If you must be absent due to illness or an emergency, you must inform the instructor via e-mail the day before or the morning of the absence. Five points will be deducted for each unexcused absence and 2 points will be deducted for each unexcused tardiness. I will follow the policies in the Team Handbook with respect to excused absences.

Averages used for grading: *
92-100 points = 4.0
86-91 points = 3.5
79-85 points = 3.0
70-78 points = 2.5
63-69 points = 2.0
55-62 points = 1.5

*Since this is a graduate course, you should work hard to earn a grade of 3.0 or better. Assignments are expected on the date due and points will be deleted for late papers unless the reason for their lateness has been discussed and approved in advance by the instructor.

Textbooks:
Inquiry Strategies for Science and Math Learning: Its Just Good Teaching
http://www.nwrel.org/msec/science_inq/whatisinq.html

Inquiry and the National Science Education Standards: A guide for Teaching and Learning
http://www.nap.edu

National Science Education Standards
http://www.nap.edu

Updated Michigan Science Benchmarks
http://michigan.gov/mde

Bibliography:
Cole, Robert W., More Strategies for Educating Everybody's Children, 2001, ASCD Publications, Alexandria, VA.

Martin, David Jerner, Elementary Science Methods: A Constructivist Approach, 1997, Delmar Publishers, Albany, New York.

Ostlund, Karen L., Science Process Skills, 1992, Addison-Wesley Publishing Company, New York, New York.

Pearce, Charles R., Nurturing Inquiry: Real Science for the Elementary Classroom, 1999, Heinemann, Portsmouth, NH.

QUESTIONS AND ASSIGNMENTS FOR READINGS

SESSION 1:

Inquiry and the National Science Education Standards, Chapter 2, Pp.18-35

1. What are the essential features of classroom inquiry?
2. What are the common components shared by instructional models?
3. List the 5 myths about inquiry-based learning and teaching.
4. Print the Inquiry and Teaching Standards.

SESSION 2:

Inquiry and the National Science Education Standards, Chapter 4, Pp.75 - 85

1. What are some purposes of assessment?
2. Describe formative assessment.
3. Describe summative assessment.
4. What should be assessed?
5. How should student learning be assessed?

SESSION 3:

Elementary Classroom Management, Chapter 9: Managing Independent Work

Describe a non-worksheet independent activity that would provide an opportunity for students to review or reinforce the key concepts of your lesson plan.

SESSION 4:

Elementary Classroom Management, Chapter 10: Managing Groupwork

Select an approach discussed in the chapter (STAD, Jigsaw, Group Investigation, or one of Kagan's cooperative structures. Describe how you would use the cooperative learning strategy you selected in your lesson plan.