THE TEACHING OF SCIENCE GRADES K-6

EDN 336	Instructor: Dr. Amy Taylor
Spring Semester 2013 ONLINE	Office: Education Building, room 260
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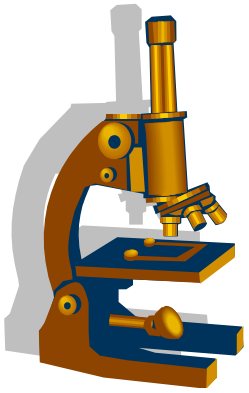
The primary mission of the Donald R. Watson College of Education at the University of North Carolina at Wilmington is to develop highly competent professionals to serve in teaching and other educational leadership roles in southeastern North Carolina, the state, and nation. The Watson College is committed to achieving excellence in teacher and administrator preparation in all of its programs.

COURSE OVERVIEW:



This course is designed to provide an opportunity for students to explore methods of teaching the biological, earth, and physical sciences to elementary children. Students will focus on current issues and trends in science education; the development, implementation, and assessment of curricular materials; the evaluation and use of technology in the classroom as well as other effective instructional strategies to teach science in the elementary school. Field experiences are required. **Prerequisites**: EDN 301 & two sciences.

COURSE PURPOSE:

The purpose of this course is to provide you with:

A. A conceptual framework that
- ✓ focuses on the teacher as a decision maker and reflective practitioner
- ✓ emphasizes the current goals of science education
- ✓ addresses the issue of science anxiety and provides strategies for handling it
- ✓ identifies characteristics of exemplary programs
- ✓ examines curricular/instructional alternatives.

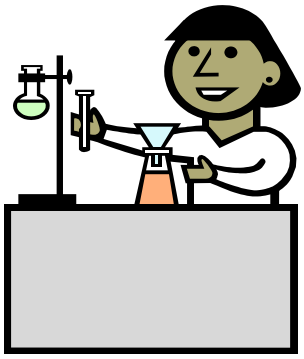
B. Ideas for teaching elementary school science to enhance your expertise in
- ✓ the selection, development and/or implementation of curricular materials resources
- ✓ the selection of instructional strategies
- ✓ the evaluation and assessment of students, teachers, and the curriculum
- ✓ communicating science concepts and ideas to a diverse student population
- ✓ fostering communication among students in order to enhance the learning of science.

C. After completing this course, you should be able to:
- ✓ develop a philosophy for teaching science in the elementary school.
- ✓ use instructional strategies that focus upon the acquisition of process skills, conceptual change/development, and integration with other subject areas.
- ✓ compare and evaluate the major curricular alternatives for teaching elementary school science.
- ✓ apply your knowledge of instructional strategies to your teaching of science.
- ✓ assess your effectiveness as a science teacher.
- ✓ use the Internet to enhance and supplement your science instruction.

The epistemology of constructivism will be used to develop understanding of how and what students learn. You will need to develop skills in listening to and understanding children as they experience science. Observations of teaching and learning in elementary classrooms and regular discussions with your colleagues will provide the forum for thinking about alternative ways of creating learning opportunities for ALL students.

A substantial factor of the level of your individual success is contingent on YOU! What you bring to the course and what you hope to learn from the interactions are very important. We will endeavor to provide many appropriate experiences based on your needs and the needs of your learners in years to come.

REQUIRED MATERIALS:



Access to Blackboard Learn Website

Course readings found within learning modules on Blackboard and some readings may be found *on electronic reserve* at Randall Library. Access the readings at: **http://library.uncw.edu/**

Beginning with the fall 2005 semester, the Watson College of Education requires that all education majors enrolled in methods courses maintain an active account on TaskStream, a web-based curriculum builder and portfolio toolset. You are asked to maintain that account for the duration of your program with the Watson College of Education (www.taskstream.com). Students in these courses will use TaskStream to maintain a Professional Development Portfolio. This portfolio includes evidence of your work to demonstrate progress toward meeting exit requirements and professional standards. *You may use TaskStream for our class to share lessons, rubrics, or assessments with me for review.*

PROFESSIONAL DEVELOPMENT: (beyond the scope of EDN 336)

It is recommended that you join the National Science Teachers Association (NSTA) at the special student membership rate ($34/yr). By joining this organization you will receive the journal Science and Children which has many activities that you can use in your teaching. You also can attend the state science teacher conference where you can get free resources and materials.

SPECIAL CONSIDERATIONS:

If you are a person with a disability and anticipate needing accommodations of any type in order to participate in this class, please notify Disability Services (Westside Hall, Ext. 7555), provide the necessary documentation of the disability and arrange for the appropriate authorized accommodations. Please identify yourself to me so that I can implement these accommodations.

PARTICIPATION:

Active participation and promptness with work are expected for all class modules, assignments, and discussions.

Students are expected to be active participants in this class:

- Complete all readings found in modules or on electronic reserves at Randall Library

- Complete all writing and activity assignments:
  Assignments with possible points can be found in the table below and explained in detail within the individual assignment links for each module [Total of 230 points]

- Be prepared to discuss assignments online
  Ten group interactions (discussions, wikis, blogs) this session. The rubric for online discussions may be found in the course materials**.**
  [10 possible points per interaction=100 possible points total].

- Complete field experience requirements

- In addition to the assignments and group interactions, there are two a **2-PART** Final Project **(Science Instructional Unit Plan *and* Components of the Science Field Experience Reflection *and* Analysis)**. This final project is a cumulative project merging your field experience with content from this course [100 points for each part].

  Total Possible Points for this Course: 530 points.

Please discuss with me in advance, if you experience any problems complying with the due dates of assignments. If this is not done, twenty percent will be subtracted from the grade received for each day the material is late.

All assignments must be typed and submitted in a professional manner in accord with guidelines set forth by MLA or APA manuscript style. Proofread before submitting— errors in grammar, spelling, punctuation, etc. will result in a lower grade.

Avoid Plagiarism! Visit the University Learning Center: Writing Services or go to http://www.edu/stuaff/uls/writing-plagiarism.htm

Field Experience Requirements

Students will engage in planning, teaching, and reflection of science instruction in an elementary classroom. They will have numerous opportunities to observe, work with students, assist with teaching and assessment, and teach a variety of lessons using what they are learning in their science methods classes. Elementary Education Majors enrolled in the corresponding labs (EDNL 332 and 333) should follow the hour requirements outlined by your lab instructor.

During your field experience for EDN 336, you are responsible for logging 10 hours of field experience on the provided log sheet. These 10 hours must include the following:

- **2 or more science lessons taught by you**
- **3 observations of your partnership teacher's science instruction**

ASSIGNMENTS AND COURSE REQUIREMENTS:

This course is designed so that learning occurs through student engagement in learning strategies that illustrate or demonstrate a philosophy of science teaching, curriculum, and learning. Students will develop as thoughtful decision makers and reflective practitioners.

Remember:
I have organized each of our Learning Modules on Blackboard Learn with a **checklist** to ensure that you have completed all parts of the module. For each module be sure to complete:

- ✓ Assigned Readings found in module and occasionally on reserve at Randall library website
- ✓ Powerpoints with topic information, links to websites, and videos for you to explore. **Detailed information and rubrics for assignments can be found within each module.**
- ✓ Double check assignment due dates on Class Schedule
- ✓ Class Interactions may vary from week to week (discussions, blogs, and wikis). Please post your response a few days before the module is due so that your classmates will have a chance to respond.

GRADING PROCEDURE:

During this course, it will be possible to earn a total of approximately 530 points. Your final letter grade will be determined based on percentage points from total:

$$\frac{\text{Pts. Received}}{530} = \%\ \text{Final Grade}$$

Grading Scale

Grade	Equivalent Percentage
A	94- 100%
A-	90-93
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D	60-69
F	59 and below

Tentative ONLINE Schedule

MODULE (Availability Date)	Due Date	Readings	Assignment *	Group Interaction (10 pts each)
Science Literacy 1-9-13	1-15-13 by midnight	Put a little science in your life by Brian Greene Less time for science article	Submit 2-3 paragraphs about importance of teaching science, literacy, and Science in YOUR life (10 pts)	Introduction Glogster!
Science Process Skills 1-16-13	1-22-13 by midnight	Process skills article	Science Process Skills assignment (10 pts)	NO
Science Inquiry 1-23-13	1-29-13 by midnight	The many levels of inquiry by Banchi	Using research to answer questions abt Science Education (10pts)	Class Blog
Science Inquiry Lesson 1-30-13	2-5-13 by midnight	Inquirize your teaching by Everett & Ready, set, go! by Erin Morgan	Complete 5 E lesson plan (30 pts)	OPEN Class Blog for feedback
Questions & Assessments 2-6-13	2-12-13 by midnight	Read articles found in this week's module	Create a rubric using Taskstream templates (10 pts)	Class Blog
Science Learning and Misconceptions 2-13-13	2-19-13 by midnight		Preconceptions List and explanations (10 pts)	Class Blog on Private Universe videos
Design Controlled Experiment 2-20-13	2-26-13 by midnight	Experimental Design Handout	Detailed design of raisin experiment (30 pts) Upload revised report to taskstream.	NONE
Midterm 2-27-13	3-5-13 by midnight	NONE	Complete Midterm and Mid Course Evaluation Survey (30 pts)	NO
Science Teaching Strategies 3-13-13	3-19-13 by midnight		Design your Safety Poster on Glogster (10 pts)	Class Wiki
Discrepant Events 3-20-13	3-26-13 by midnight	Activities in discrepant event folder on e-reserves.	Discrepant Event Exploration (30 pts)	Class Blog
Diverse Learners 3-27-13	4-2-13 by midnight	Readings by Marcee Steele	Answer questions about diverse learners (10 pts)	Wiki Group
Technology and Integration 4-3-13	4-9-13 by midnight	Implementing Science Notebooks by Catherine Nesbit	Evaluate a science website for elementary students based on ABC strategy(10 pts)	Wiki Group
Science Resources 4-10-13	4-16-13 by midnight	Any two articles of from Science and Children folder on e-reserves.	Journal Review (30 pts)	Whole Class Discussion
4-17-13	4-23-13 by midnight	NONE	Science Content and Instructional Plan (100 pts)	NO
4-24-13	5-1-13 by midnight	NONE	Turn in Field Experience Final Project (100 pts)	Class Discussion

**** Note: Readings are found in our Blackboard Modules and on electronic course reserve.***

Final Projects

Science Instructional Unit Plan-
(100 pts)

Often new teachers have difficulty visualizing the connection between science content, Science Standards, and their own lesson plans. The purpose of this assignment is to develop a science unit that explores a science content area of your choice (chosen from the NC essential standards for K-5 science). As part of this final project, you will have to explore a science content area of your choice, correlate it to National and State science standards and design unit lessons in the 5E format about that topic. You will need to turn in a word processed commentary that includes the following sections:

a. Choose a type of science that you want to focus on such as earth, life, physical, or space science, etc. Give a brief overview about that type of science. What subgroups are found in this science? What are the major components included in this science. 1-2 pages (10pts)

b. Now, pick one concept that you want to explore in more detail from that science. (For example, if you chose earth science then you could explore plate tectonics.) Write a 3-5 page paper on this concept including important vocabulary, theories, and information. Be sure to include references. This paper should be detailed and intended for other teachers to use as a resource. (30 pts)

c. Examine and research learners' understandings of this topic. What level of understanding is expected for students in elementary school? What are common learner misconceptions related to this topic? Be sure to include references. 2-3 pages. (10pts)

d. Identify all NC essential standards and National Science Teaching Standards that are correlated with your science concept and specific grade level. NC Essential standards are available at the following website: http://www.dpi.state.nc.us/acre/standards/new-standards/. A PDF of the National Science Education Standards can be downloaded for free from: http://www.nap.edu/openbook.php?record_id=4962 (10pts)

e. Finally, choose a specific grade level and write a ***detailed*** 5 E lesson plan to teach a specific concept. Within this lesson plan be sure to include all resources that a teacher would need such as book titles, website links, materials. Also, create a component geared toward the students at the specific grade level that utilizes some sort of visual technology to help teach your lesson such as:
Youtube, xtranormal, animoto, slide rocket, Stixy, Storybird, VoiceThread, storyjumper, Fotobabble, capzles, dipity, prezi, Popplet, 280Slides, PreZentit, authorSTREAM, Zoho Show, Slideshare, GoAnimate, Vuvox, Viddix, Vcasmo, Preezo, Present.io, My Brain Shark, Slideboom, Empressr (40pts)

Components of the Science Field Experience Reflection *and* Analysis:
(100 pts)

a. Field Experience Contact Signed Log (5 pts.)

Field experiences are required for EDN 336. Make sure that you pay close attention to e-mails from Stephanie Gumina (field experience office) to receive a placement by the date determined. Once you are given your field experience placement, you are expected to be in the school on a consistent and predictable basis. **This signed log must be scanned and submitted as part of your final project.**

b. General observations of the class: classroom layout, demographics, behavior management policy, procedures, etc. (10 pts.)

c. Assessments: What types of formative or summative assessments did you observe within your classroom. Describe the how assessments were used and what you learned about them. (10 pts.)

d. Reflective observations describing **3** science lessons you observe with comments on what went well and what you would have done differently. Include a thoughtful **analysis of the science teaching strategies** applying the principles and concepts learned in EDN-336. (20 pts.)

e. ***Two detailed lesson plans*** that you teach during your field experience lessons in the 5 E format. Be sure to include all components of the lesson in ***great detail***. If possible, try to integrate this science lesson with some other content area such as math, reading, or social studies. Please share your lessons with me in this final project either embedded in a word document or by providing hyperlinks to Taskstream lessons. Feel free to share student work, pictures, and/or videos. (20 pts)

f. Reflective comments on the positive and negative aspects of the science lessons you teach. **Brief overview of what you did, what went well, what didn't go well, and what would you change next time.** A simple description of what you taught will not be acceptable. (20 pts.)

g. A summary of your field experience including comments on what you learned in relationship to the time invested. (15 pts.)

Please compile components a-g into one document if possible. If the file is too large then you may separate it into separate documents. Please label each component accordingly.

Religious Observance Policy

In accordance with NC SL 2010-211, you are entitled to two excused absences for religious observances **per academic year**. You must inform me in writing the first week of class if you will be missing any classes due to religious observance and using one of the two permissible absences for the academic year. In addition, please inform the Registrar the first week of class who will then confirm your intentions to miss class with the impacted course instructors. Any absence for religious purposes will be considered unexcused unless you submit the request in writing the first week to me and the Registrar.

The UNCW Statement on Diversity in the University Community

As an institution of higher learning, the University of North Carolina Wilmington represents a rich diversity of human beings among its faculty, staff, and students and is committed to maintaining a campus environment that values that diversity. Accordingly, the university supports policies, curricula, and co-curricular activities that encourage understanding of and appreciation for all members of its community and will not tolerate any harassment or disrespect for persons because of race, gender, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, political affiliation, marital status, or relationship to other university constituents. Students with Disabilities information and resources available at http://www.uncw.edu/stuaff/disability/