

Using Advanced Technologies to Teach about the Environment

EVS 560	Instructor: Dr. Amy Taylor
Spring Semester 2013	Office: Education Building, room 260
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COURSE OVERVIEW

EVS 560

This course will focus on: the use of technologies to teach about the environment, current issues and trends in environmental education; the development, implementation, and assessment of new technologies; and effective instructional strategies to teach key environmental principles and concepts. Students will gain experience incorporating the epistemology of constructivism as they utilize an inquiry-based approach to their teaching strategies. Through exploration of curriculum, resources, and pedagogy, students will be able to bridge the gap between informal and formal science education.

Prerequisites: None

Our primary mode of communication will be through our Blackboard Learn site. Please visit this site often to check for announcements, weekly course readings, print class material, complete online learning modules, etc. I will open new modules every week on Thursday at Noon. These new modules will include readings and information for the upcoming class.

COURSE OUTLINE:

The purpose of this course is to provide you with:

A theoretical and conceptual framework that

- addresses the current goals of environmental education,
- identifies characteristics of exemplary programs, and
- examines and/or utilizes curricular/instructional alternatives.

Knowledge and the skills to use the following technologies in formal and informal settings:

Internet based data visualization tools (DVTs)
Probeware data collection
iPads
Selected websites
Robotics

Google Earth
Simulations/gaming/virtual worlds
Nanotechnology
Interactive presentation tools
G.I.S. and GPS

Environmental Education Center Guidelines

After completing EVS 560, you should be able to:

1. Present and defend a philosophy for teaching environmental education
2. Use advanced technologies that focus upon the acquisition of process skills and conceptual change/development.
3. Compare and evaluate the major curricular alternatives for environmental education
4. Apply your knowledge of environmental issues to instructional strategies for teaching environmental education and implement a student developed learning module.
5. Assess your effectiveness as an environmental educator.
6. Analyze various technologies to enhance your teaching about the environment.
7. Evaluate instructional design of lessons within formal and informal settings.

I emphasize the importance of creating integrated thematic units and the 5-E learning cycle within science lessons. In the 5-E learning cycle, students are first *engaged* in the learning before they *explore* their ideas. Following a common exploration “hands-on” type activity, teachers and students exchange *explanations* of a particular concept or idea. Students are then challenged to *elaborate* or *extend* their conceptual understanding to a new context. *Evaluation*, or assessment, takes place throughout the whole learning cycle. Observations of teaching and learning in elementary and middle school classrooms and regular discussions with your colleagues will provide the forum for thinking about alternative ways of creating learning opportunities for ALL students.

University Mission Statement

The University of North Carolina at Wilmington is a public comprehensive university dedicated to excellence in teaching, scholarship and artistic achievement, and service. Through the College of Arts and Sciences, the professional schools, and the graduate school, the university seeks to stimulate intellectual curiosity, imagination, rational thinking, and thoughtful expression in a broad range of disciplines and professional fields. Of prime importance is the university's commitment to undergraduate teaching. The humanities, the arts, the natural and mathematical sciences, and the behavioral and social sciences comprise the core of the undergraduate curriculum. Strong graduate programs complement the undergraduate curriculum. The university considers scholarly practice, research, and creative activities essential for effective learning.

UNCW Learning Goals

The four categories of student learning articulated in the university's [mission](#)—creative inquiry, critical thinking, thoughtful expression and responsible citizenship—give rise to eight learning goals for every baccalaureate graduate of UNCW. These goals capture the skills and expected student learning outcomes needed to ensure breadth of learning characteristic of a liberal education (the goal of a general education program).

COURSE READINGS:

- a. Selected journal articles, laboratory guides, and curriculum/reference materials found within the *weekly* Blackboard Learning Modules.
- b. Selected Chapters from *The Case for Constructivist Classrooms* by Brooks and Brooks.

(The intro and chapters 1 & 2 are available free on the Web)

- c. NSTA Teacher Journals: *Science and Children*, *Science Scope*, and *The Science Teacher*
- d. Research Journals such as *Journal of Research in Science Teaching*, *Science Education*, *International Journal of Science Education*, *Journal of Elementary Science Education*, *School Science and Mathematics*, *Journal of Environmental Education*, *The Earth Scientist*, and *International Journal of Environmental and Science Education*.

OTHER OPTIONAL RESOURCES:

- Louv, R. (2005). *Last Child in the Woods*. Algonquin Books of Chapel Hill.
- Liem, T.L. (1987). *Invitations to Science Inquiry* (2nd Ed.). (\$60) see amazon.com
- North Carolina Department of Public Instruction (NCDPI)
 - Students will use this web page to “serve as a curriculum terminal from which you can travel to specific goals and objectives based on discipline and grade level. This service provides a convenient way for teachers, administrators, and parents to verify the instructional objectives of the Common Core and Essential Standards at a given grade and subject area.”
 - <http://www.ncpublicschools.org/acre/standards/new-standards/#science>
- North Carolina Professional Teaching Standards
 - “Every public school student will graduate from high school, globally competitive for work and postsecondary education and prepared for life in the 21st Century.”
 - <http://www.ncptsc.org/Final%20Standards%20Document.pdf>
- AAAS, (1993). *Benchmarks for Science Literacy*. Oxford University Press, New York.
 - www.project2061.org/tools/benchol/bolframe.htm
- National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press. <http://www.nap.edu/readingroom/books/nses/>
- NESTA, National Earth Science Teacher Association. *The Earth Scientist* Journal. <http://www.nestanet.org/cms/content/welcome>
- North American Association for Environmental Education. Guidelines for Excellence in Environmental Education published by the NAAEE: <http://eelinked.naaee.net/n/guidelines/posts/Environmental-Education-Materials-Guidelines-for-Excellence>

Professional Development (beyond the scope of this course)

It is recommended that you join a professional organization to keep you up to date on current issues and trends in your field. Join now and get special student membership rates.

1. National Science Teachers Association (NSTA) for \$34/yr. Be sure to mark the Journal for the level you teach. You may also want to participate in the local student chapter of NSTA. <http://www.nsta.org/membership/student.aspx>
2. North American Association for Environmental Education (NAAEE) for \$35/yr. <http://www.naaee.net/membership/categories>
<http://eelinked.naaee.net/>
3. You may also wish to subscribe to the *Journal of Environmental Education* and participate in the local chapter activities.

ATTENDANCE AND PARTICIPATION:

Active participation and promptness with work are expected for all class sessions, assignments, and discussions. Students are expected to be active participants in this class—that is, to complete all reading, writing and activity assignments. Each anticipated absence must be discussed with the instructor in advance. Each unanticipated absence must be discussed with the instructor immediately upon return to class. In the case of excessive absences, your grade may be lowered at the discretion of the instructor.

In the case of an absence, it is the student's responsibility to find out what work was missed, and to make work up on his or her own time. I recommend finding a "study buddy" that would be willing to share with you all vital information.

ASSIGNMENTS AND COURSE REQUIREMENTS:

All material submitted for grading must be neatly typed or handwritten in ink on standard sized paper with clean margins with careful attention given to grammatical conventions. Please discuss with me at least 2 days in advance any problems you will have meeting a due date. If this is not done, 20 percent will be subtracted from the grade received for each day the material is late.

Students are bound by the UNCW Student Academic Honor Code. Any Honor Code offense (e.g., sanctions as set forth in University policy, including, but not limited to, a 0 on the assignment. Ensure all work is original (i.e., conceived and written the student) and developed specifically for this course. Any work that is explicitly borrowed must be indicated by providing the proper citation using APA 6th edition formatting.

- Participation (25 points)
- Weekly Quizzes (50 points total)
- Environmental Issue Glog (25 points)
- Work with a partner to develop, conduct and present to the class the design and results of an extended (3 week) probeware experiment and a detailed instructional plan. (75 total points)
 - Experimental Design Probeware Report
 - Each student should write one instructional plan to accompany their experiment
 - Presentation incorporating some form of technology
- After attending Project Wild or Aquatic Wild, prepare a two page paper describing a technology-rich modification of an activity found within the resource guide you will receive at the workshop. (25 points)
- 3-hour Field Experience. You will be able to choose from a wide range of experiences designed to enrich your experiences in a non-traditional science setting. Such activities may include serving as a science fair judge, attending a conference, assisting a park ranger or school during a science field trip, assisting with the UNCW Science Olympics, etc. This assignment must be approved by submitting a description of what you are planning to do, and a short description of how technology could have been incorporated to improve this experience. (25 points)
- Environmental Education paper and presentation: Prepare a paper (5-10 pages) outlining your view of the *Ideal Environmental Education* classroom. This should include both the curriculum focus aligned to the Common Core Essential Standards, incorporation of technology, and strategies for engaging the students. Share a 10-15 minute interactive snapshot of your ideas. (50 points)

- Begin your paper with a literature review of science education journal articles to explore what and how environmental education is currently being researched. Then design an environmental education curriculum instructional unit for a classroom.
- Be creative when choosing which type of presentation tool when sharing your product. Examples of tools: 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, or Empressr just to name a few.
- Select an environmental focus and then lead a class discussion and activity on: GPS, G.I.S., the USGS , NOAA websites, etc. (25 points)
- Comprehensive Final Exam (50 points)

Grading Procedure:

During this course, it will be possible to earn a total of 350 points for EVS 560. Your final letter grade will be determined based on percentage points from total:


$$\frac{\text{Pts. Received}}{350 \text{ points}} = \% = \text{Final Grade}$$

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

Select from one of the following

Aquatic Project WILD	Tuesday Feb. 5 and Thursday, Feb 7	5:00-8:00
Project WILD	Saturday, Feb. 23	9:00-3:30
Aquatic Project WILD	Tuesday Mar. 12 and Thursday, Mar. 14	5:00-8:00
Growing Up WILD	Saturday Mar. 16	9:00-3:30

Tentative Schedule for EVS 560

DATE	Learning Module Topic	Reminders and What's Due?
1/9	Welcome to EVS 560! Environmental Education Formal Science vs. Informal Science Topics Graduate student assignment planning	Bring Syllabus North Carolina Environmental Literacy Plan
1/16	Bridging the gap between formal & informal science education: From a teacher's perspective, Mr. David Glenn (Burgaw M.S.) Inquiry Learning Model Begin working on Instructional Plans/Units	Quiz and discussion on Brooks National Science Education Standards North Carolina Essential Science Standards Read Intro, chapters 1 & 2 of Brooks and Brooks
1/23	Utilizing River Run DVT to facilitate inquiry with Dr. Rich Huber Graduate student assignment planning	Inquiry Learning Model Quiz Internet tools for facilitating inquiry by Huber
1/30	New River DVT Ocean View	River Run Quiz
2/6	Using Google Earth Cheston Saunders, WVU Graduate student assignment planning	DVT quiz
2/13	Introduction to Probeware Mr. Chris Gorman Specialization with data collection for research	Experimental design quiz
2/20	Digital Microscopes with Dr. Dennis Kubasko TEM with Dr. Richard Dillaman Planning for Probeware research	Bring outline for experiment and unit Digital Microscopes: Enhancing Collaboration
2/27	Planetarium & Research project workday Utilizing Science Websites	Bring draft for experiment and unit
3/6	SPRING BREAK 	Work on research projects
3/13	Nanotechnology Dr. Gail Jones, NCSU	Virtual Viruses & Haptics in Education See Blackboard Module
3/20	Using Squeak to Infuse Information Technology into the STEM with Dr. Sridhar Narayan Probeware research presentations	SQUEAK Technologies Presentations & instructional plan
3/27	Teaching Technologies and Gaming with Jeff Ertzberger & Salena Rabidoux Probeware research presentations	Uncw.edu/EdGames Presentations & instructional plan
4/3	GIS exploration w/ Jeremy, Tracy, & Morgan Probeware research presentations	Presentations & instructional plan
4/10	Introduction to GPS and handheld units Mr. Chris Gordon	Technology-based Project Wild Lesson Due
4/17	Robotics with Mr. Chris Gordon EE presentations	
4/24	EE presentations Review for final exam	Field Experience Reflections Due
5/1	Final Exam	

Online Resources:

River Run DVT: <http://uncw.edu/riverrun/river-dataRR.htm>

New River DVT: <http://www.uncw.edu/riverrun/DWQ/DWQindex.htm>

Ocean View: <http://uncw.edu/Oceanview/>

EPA Air Now: <http://airnow.gov/>

USGS: <http://www.usgs.gov/>

Gizmos: <http://www.explorelarning.com/>

NASA GIS book http://www.nasa.gov/pdf/703154main_earth_art-ebook.pdf

SQUEAK <http://www.csc.uncw.edu/useit/>

NC Envir ED <http://www.eenorthcarolina.org/index.asp>

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.

Please silence your cell phone and do not make calls, access applications or text during class. If you have a personal, urgent matter for which you need to be on call, please let me know in advance. In addition, please do not have active any PDAs or laptops/netbooks/iPads open and active unless the activity warrants. We will use these devices in selected activities and they are permissible then.

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.

UNCW practices a *zero-tolerance policy* for violence and harassment of any kind. For emergencies contact UNCW CARE at 962-2273, Campus Police at 962-3184, or Wilmington Police at 911. For University or community resources visit <http://www.uncw.edu/stuaff/care/>.