

<p>Program Course Information:</p>	<p>PROGRAM: COLE/NC TEACH EDUC 551 SECTION 963 COURSE TITLE: Designing Science Tasks</p> <p>INSTRUCTOR NAME and CONTACT INFORMATION: Dr. Nick Cabot nicabot@email.unc.edu Phone Number: 843-9844 (office) Office: Peabody 201A Office hours: by appointment and anytime via email Blackboard Course Site: Login to http://blackboard.unc.edu/ and select EDUC 551 Acrobat Connect Course Site: Login to http://breeze.unc.edu/ and select EDUC 551</p> <p>DATE SYLLABUS REVISED: August 2009 COURSE DESCRIPTION: In this methods course you will become better prepared to teach any science course at the middle and/or secondary level. This course integrates science content with multiple methods (pedagogical strategies) for teaching such content to an increasingly diverse group of learners. Each student will build upon the strengths he/she already brings to the teaching profession.</p>
<p>UNC-CH School of Education Conceptual Framework:</p>	<p>Preparing Leaders in Education</p> <p>The School of Education is committed to the preparation of candidates who can assume leadership roles in the field of education. Such preparation is accomplished through the coherent integration of the abilities and predispositions of candidates, the knowledge and abilities of faculty, and the contextual elements of academic and field settings. Candidates accept their professional responsibilities and focus their expertise and energy on supporting Birth-12 student development and learning. They must work to maintain a meaningful involvement in activities within schools and in partnership with parents and the community.</p> <p>The growth and development of candidates is promoted through curriculum, instruction, research, field experiences, clinical practice, assessments, evaluations, and interactions with faculty and peers. All of these elements work together to build a solid foundation for exemplary practice in education, creating educational practitioners who are prepared to better serve children, families and schools, as well as business and agencies of government within North Carolina, across the nation and throughout the world.</p> <p>For Equity and Excellence</p> <p>Preparation of educational leaders for today's society is based in values of equity and excellence that assure our candidates' and their students' future success. Attending to the challenge of promoting both equity and excellence is imperative. To address only one of these goals would, on the one hand, sacrifice those put at risk by social and cultural hierarchies in society or would, on the other hand, fail to press for the highest possible levels of accomplishment. Equity and excellence must be pursued concurrently to assure that all students are well served and that all are encouraged to perform at their highest level.</p> <p>Within the School of Education, equity is seen as the state, quality, or ideal of social justice and fairness. It begins with the recognition that there is individual and cultural achievement among all social groups and that this achievement benefits all students and educators. Equity acknowledges that ignorance of the richness of diversity limits human potential. A perspective of equity also acknowledges the unequal treatment of those who have been historically discriminated against based on their ability, parents' income, race, gender, ethnicity, culture, neighborhood, sexuality, or home language, and supports the closure of gaps in academic achievement. Decisions grounded in equity must establish that a wide range of learners have access to high quality education in order to release the excellence of culture and character which can be utilized by all citizens of a democratic society.</p> <p>Within the School of Education, excellence is seen as striving for optimal development, high levels of achievement and performance for all and in all that is done. In preparatory programs across grade levels, curriculum and instruction furthers excellence when it moves a learner as effectively as possible toward expertise as a thinker, problem solver and creator of knowledge. Excellence entails a commitment to fully developing candidates, not only academically but also in moral and political senses.</p>

	<p>In a Democratic Society</p> <p>The preparation of exemplary practitioners in education to meet the challenges of equity and excellence is best accomplished through preparation for a democratic society. Democracy around the globe is an ideal, one with the potential to meet the needs, recognize the interests and establish the rights of all citizens. Education is a necessary foundation for this ideal, and both must be subscribed to and participated in by all.</p> <p>School of Education Conceptual Framework Principles</p> <p>The School of Education is committed to diverse, equitable, democratic learning communities. As a result, candidates are expected to acquire and apply the knowledge, skills and dispositions that prepare them to support the development and education of all students.</p> <p>The School of Education uses the following unit principles, applicable at all program levels, to identify the knowledge and skills that are central to preparation of candidates. It is the School of Education 19s goal that candidates will become leaders supporting and promoting the development, teaching and learning of all students in multiple contexts.</p> <ol style="list-style-type: none"> 1. Candidates possess the necessary content knowledge to support and enhance student development and learning. 2. Candidates possess the necessary professional knowledge to support and enhance student development and learning, including meeting student needs across physical, social, psychological, and intellectual contexts. Candidates incorporate a variety of strategies, such as technology, to enhance student learning. 3. Candidates possess the necessary knowledge and skills to conduct and interpret appropriate assessments. 4. Candidates view and conduct themselves as professionals, providing leadership in their chosen field, including effective communication and collaboration with students and stakeholders. <p>SOE Conceptual Framework Dispositions</p> <p>Certain dispositions are essential to prepare leaders who support equity and excellence in education within a democratic society. Dispositions are beliefs that foster commitments, leading to actions within educational environments with students, colleagues, families, and communities. Candidates strengthen these dispositions as they think deeply, reflect critically and act responsibly in their professional practice. These dispositions are interconnected with knowledge and skills; specific dispositions connect to and exemplify unit principles, facilitating their enactment in particular programs.</p> <ol style="list-style-type: none"> 1. Candidates will exhibit behavior that demonstrates a belief that all individuals can develop, learn, and make positive contributions to society. 2. Candidates will exhibit behavior that demonstrates a belief that continuous inquiry and reflection can improve professional practice.
Course Objectives:	<ol style="list-style-type: none"> 1. Understand the expectations for science teaching presented in the science education reform documents (specifically the National Science Education Standards and North Carolina Standard Course of Study) and develop and implement science lessons that meet the expectations set forth in these documents. 2. Understand how to create a safe, nurturing classroom environment where all students have the opportunity to grow and learn. 3. Describe and use a diverse repertoire of instructional strategies in teaching science. 4. Implement assessments to evaluate one’s own teaching and student learning. 5. Differentiation
Course Standards (Addressed):	<p>National Science Education Standards – Science Teaching Standards:</p> <ol style="list-style-type: none"> A. Teachers of science plan inquiry-based science program for their students. B. Teachers of science guide and facilitate learning. D. Teachers of science design and manage learning environments that provide students with time, space and resources needed for learning science.

E. Teachers of science develop communities of science learners that reflect the intellectual rigor of scientific inquiry and the attitudes and social values conducive to science learning.

SOE Principles:

1. Candidates possess the necessary content knowledge to support and enhance student development and learning
4. Candidates view and conduct themselves as professionals, providing leadership in their chosen field.

SOE Dispositions:

1. Candidates will exhibit behavior that demonstrates a belief that all individuals can develop, learn, and make positive contributions of society.
2. Candidates will exhibit behavior that demonstrates a belief that continuous inquiry and reflection can improve professional practice.

INTASC Standards:

1. The teacher understands the central concepts, tools of inquiry, and the structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.
2. The teacher of science understands how students learn and develop and can provide learning opportunities that support students' intellectual, social, and personal development.
3. The teacher of science understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.
4. The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.
6. The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
7. The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals.
8. The teacher of science understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student.
9. The teacher of science is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.

North Carolina Specialty Standards for Science:

1. Science teachers understand the unifying concepts of science.
2. Science teachers understand the nature of science and the development of scientific thought.
3. Science teachers understand the historical development of scientific thought and the application of science in society.
7. Science teachers organize and manage the science learning environment to ensure optimal science learning.
9. Science teachers integrate appropriate technology to enhance instruction in science and scientific investigation.
10. Science teachers develop strategies to address science topics that are controversial to diverse groups.
11. Science teachers encourage underrepresented groups to engage in science.
13. Science teachers research and learn to apply best practice in science education and participate in the dissemination of those ideas.
14. Science teachers understand safety and liability issues in science and advocate for appropriate safety materials and enforcement practices in the classroom.

NC Core Standards:

1. Teachers know the content they teach.
4. Teachers are leaders.
6. Teachers respect and care about students.

NC Diversity Standards:

1. Teachers understand the central concepts, tools of inquiry, and structures of the discipline(s) they teach and can create classroom environments and learning experiences that make these aspects of subject matter accessible, meaningful and culturally relevant for diverse learners.
3. Teachers work collaboratively to develop linkages with parents/ caretakers, school colleagues, community members and agencies that enhance the educational experiences and well being of diverse learners.

	<p>4. Teachers acknowledge and understand that diversity exists in society and utilize this diversity to strengthen the classroom environment to meet the needs of individual learners.</p> <p>6. Teachers of diverse students are reflective practitioners who are committed to educational equity.</p> <p>NC Technology Standards:</p> <p>1. Teachers plan and design effective learning environments and experiences supported by technology.</p> <p>3. Teachers implement curriculum plans that include methods and strategies for applying technology to maximize student learning.</p> <p>4. Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies.</p> <p>5. Teachers use technology to enhance their productivity and professional practice.</p> <p>NC Science Standards:</p> <p>2. Science teachers understand the nature of science and the development of scientific thought</p> <p>6. Science teachers plan and implement appropriate scientific investigations to develop problem solving and critical thinking skills in science</p> <p>8. Science teachers create and use appropriate assessment strategies and instruments to improve science instruction for all students.</p> <p>9. Science teachers integrate appropriate technology to enhance instruction in science and scientific investigation.</p> <p>10. Science teachers develop strategies to address science topics that are controversial to diverse groups.</p> <p>11. Science teachers encourage underrepresented groups to engage in science.</p> <p>14. Science teachers understand safety and liability issues in science and advocate for appropriate safety materials and enforcement practices in the classroom.</p>
<p>Course Standards (Assessed):</p>	<p>SOE Principles:</p> <p>1. Candidates possess the necessary content knowledge to support and enhance student development and learning</p> <p>4. Candidates view and conduct themselves as professionals, providing leadership in their chosen field.</p> <p>SOE Dispositions:</p> <p>2. Candidates will exhibit behavior that demonstrates a belief that continuous inquiry and reflection can improve professional practice.</p> <p>National Science Education Standards – Science Teaching Standards:</p> <p>A. Teachers of science plan inquiry-based science program for their students.</p> <p>INTASC Standards:</p> <p>1. The teacher understands the central concepts, tools of inquiry, and the structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.</p> <p>4. The teacher understands and uses a variety of instructional strategies to encourage students’ development of critical thinking, problem solving, and performance skills.</p> <p>7. The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals.</p> <p>North Carolina Specialty Standards for Science:</p> <p>2. Science teachers understand the nature of science and the development of scientific thought.</p> <p>7. Science teachers organize and manage the science learning environment to ensure optimal science learning.</p> <p>13. Science teachers research and learn to apply best practice in science education and participate in the dissemination of those ideas.</p> <p>14. Science teachers understand safety and liability issues in science and advocate for appropriate safety materials and enforcement practices in the classroom.</p> <p>NC Core Standards:</p> <p>1. Teachers know the content they teach.</p> <p>NC Diversity Standards:</p> <p>1. Teachers understand the central concepts, tools of inquiry, and structures of the discipline(s) they teach and can create classroom environments and learning experiences that make these aspects of subject matter accessible, meaningful and culturally relevant for diverse learners.</p>

	<p>NC Science Standards: 2. Science teachers understand the nature of science and the development of scientific thought 14. Science teachers understand safety and liability issues in science and advocate for appropriate safety materials and enforcement practices in the classroom.</p>
<p>Activities & Assignments:</p>	<p><u>Safety Report Letter – DUE Sept. 17</u></p> <p>Using the Safety Checklist provided in your course packet, analyze a laboratory environment in your school (preferably your own room if you have lab facilities). Analyze your results for any poor rankings and rank order your findings according to degree of severity. You will then write a letter to your principal indicating:</p> <ul style="list-style-type: none"> • who you are • what you did • why you did this • what you found • what are the most severe items that need to be addressed • explanations of the fixes you propose • a rough estimate of the cost for all repairs (use a scientific catalog such as Flinn or Fisher to get price quotes) <p>This should be a professional written letter and should be approximately 2-3 pages in length. It is up to you whether or not you actually deliver it to your principal, but I encourage you to at least consider it</p> <p><u>Cookbook into Inquiry Lesson Plan – DUE Oct. 15</u></p> <p>Using the Volkmann & Abell article (Rethinking Laboratories) and Mortimer & Scott (Meaning Making in Secondary Science Classrooms) for guidance, you will convert a cookbook lab into an inquiry oriented activity. Choose any traditional lab activity that is appropriate to the content and grade level you are or will be teaching. This can come from your textbook, supplemental materials, online, etc. Provide an electronic copy of the original lab (can retype or scan) along with your converted activity. You must also provide a 2-3 page document that explains each change you made and the rationale for the change. In other words, if you change the statement of purpose tell me WHY you did so. Ideally, you will end up with a finished product that you can use sometime during this school year. It is not an easy thing to do for the first time and I expect that you will struggle. I want to stretch your thinking and challenge your preconceptions about inquiry!</p> <p><u>Science Conference Report – DUE Dec. 3</u></p> <p>Students will write a 2-3 page conference report summary. The report should include the following questions:</p> <ul style="list-style-type: none"> • Which conference did you attend? • Which sessions did you attend? • Which speakers and/or topics were the most interesting to you? • What did you learn about students? • What did you learn about teachers? • What did you learning about teaching? • What are the 2-3 most important things that you will take away from this conference? Why?
<p>Requirements:</p>	<p><u>Policies:</u></p> <ul style="list-style-type: none"> • You are responsible for knowing and adhering to due dates. Please do not request extensions or make-ups except under extraordinary circumstances. • You are expected to abide by the UNC Honor Code. Plagiarism and cheating are not accepted and all suspected cases will be pursued. • All work turned in is expected to be of professional quality. This means that it will be free of typos, grammatical errors, and slang, and that written and oral presentations will be coherent and follow a logical progression. <p><u>Grading:</u></p> <p>A grade of HIGH PASS (H) is reserved for students who excel at all assignments, who attend each class session, and who evince quality participation. A grade of PASS (P) will be assigned to students who complete all assignments, attend class, and competently prepare and participate. A grade of LOW PASS (L) will be assigned to students whose work is consistently less than proficient.</p>

Topics:	Inquiry Teaching and Learning, Effective Lecturing/Interactive Lecturing, Science Process Skills, Diverse Learners, Laboratory Safety
Disability Services Information:	If you have a medical condition/disability that may require reasonable accommodation to ensure equal access to this course, please contact the Department of Disability Services at 962.8300, on the internet at http://disabilityservices.unc.edu/eligibility/index.html or via email at disabilityservices@unc.edu
Honor Code Information:	The University of North Carolina at Chapel Hill has had a student-administered honor system and judicial system for over 100 years. The system is the responsibility of students and is regulated and governed by them, but faculty share the responsibility. If you have questions about your responsibility under the honor code, please bring them to your instructor or consult with the office of the Dean of Students or the Instrument of Student Judicial Governance. This document, adopted by the Chancellor, the Faculty Council, and the Student Congress, contains all policies and procedures pertaining to the student honor system. Your full participation and observance of the honor code is expected. If you require further information on the definition of plagiarism, authorized vs. unauthorized collaboration, unauthorized materials, consequences of violations, or additional information on the Honor Code at UNC, please visit http://honor.unc.edu .
References & Resources:	[insert references and resources here]