Secondary Science Methods  
CURR 5493  
Fall 2012

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Office Hours: Th/F 11:00 a.m. – 1:00 p.m. or by appointment

Required Textbook:  

Additional Resources (or Recommended Textbooks):  
- Colorado Academic Standards –Science: [http://www.cde.state.co.us/cdeassess/UAS/CoAcademicStandards.html](http://www.cde.state.co.us/cdeassess/UAS/CoAcademicStandards.html)  
  (click on Printable Standards, choose science in PDF format)  
- National Academy Inquiry and the National Science Standards  
- Benchmarks for Science Literacy (free online)  
- National Academy Science Standards (free online)  
- Science for All Americans (free online)  
- Science Matters  
- Making Sense of Secondary Science
Course Overview: This course presents an overview of the methods, materials, and curricula currently in use in secondary science education and general secondary curriculum in instruction. Integration of standards-driven inquiry-based, discovery, and problem-solving techniques and strategies will be stressed. Students will be prepared to become confident in teaching science. Promotion of positive attitudes and understanding, gender equity issues, and hands-on teaching and learning will be emphasized. Students will learn how to make decisions in diverse contexts, to understand and use the theme of “Educational Leaders and Learners” throughout their teaching, to develop appropriate assessment strategies, to use technology, and to apply state and national science curriculum standards. This course will continue to emphasize lesson planning, assessment, implementation of classroom management philosophies, and ethical and professional responsibilities in the classroom.

Course Objectives: Upon successful completion of this course students will be prepared to meet the following standards:

**NSTA SCIENCE STANDARDS**

1. **Content.** Teachers of science understand and can articulate the knowledge and practices of contemporary science. They can interrelate and interpret important concepts, ideas, and applications in their fields of licensure; and can conduct scientific investigations. To show that they are prepared in content, teachers of science must demonstrate that they:
   
   a. Understand and can successfully convey to students the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association.
   
   b. Understand and can successfully convey to students the unifying concepts of science delineated by the National Science Education Standards.
   
   c. Understand and can successfully convey to students important personal and technological applications of science in their fields of licensure.
   
   d. Understand research and can successfully design, conduct, report and evaluate investigations in science.
   
   e. Understand and can successfully use mathematics to process and report data, and solve problems, in their field(s) of licensure. (CO PB Standard 2.2, 3.1, 3.2, 3.3, 3.4, 3.7, 3.8, 4.1-4.4, 5.1-5.9)

2. **Nature of Science.** Teachers of science engage students effectively in studies of the history, philosophy, and practice of science. They enable students to distinguish science from non-science, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science. To show they are prepared to teach the nature of science, teachers of science must demonstrate that they:
   
   a. Understand the historical and cultural development of science and the evolution of knowledge in their discipline.
   
   b. Understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world.
   
   c. Engage students successfully in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science. (CO PB Standard 2.2, 3.1, 3.2, 3.3, 3.4, 3.7, 3.8, 4.1-4.4, 5.1-5.9, 8.1, 8.2)

3. **Inquiry.** Teachers of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually
and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences. To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they:

a. Understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge.

b. Engage students successfully in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner. (CO PB Standard 2.2, 3.1, 3.2, 3.7, 4.1, 4.2, 4.3, 5.1,-5.9)

4. Issues Teachers of science recognize that informed citizens must be prepared to make decisions and take action on contemporary science- and technology-related issues of interest to the general society. They require students to conduct inquiries into the factual basis of such issues and to assess possible actions and outcomes based upon their goals and values. To show that they are prepared to engage students in studies of issues related to science, teachers of science must demonstrate that they:

a. Understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues.

b. Engage students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students. (CO PB Standard 2.2, 3.1, 3.2, 3.3, 3.4, 3.7, 3.8, 4.1-4.4, 5.1-5.9, 7.1-7.5)

5. General Skills of Teaching. Teachers of science create a community of diverse learners who construct meaning from their science experiences and possess a disposition for further exploration and learning. They use, and can justify, a variety of classroom arrangements, groupings, actions, strategies, and methodologies. To show that they are prepared to create a community of diverse learners, teachers of science must demonstrate that they:

a. Vary their teaching actions, strategies, and methods to promote the development of multiple student skills and levels of understanding.

b. Successfully promote the learning of science by students with different abilities, needs, interests, and backgrounds.

c. Successfully organize and engage students in collaborative learning using different student group learning strategies.

d. Successfully use technological tools, including but not limited to computer technology, to access resources, collect and process data, and facilitate the learning of science.

e. Understand and build effectively upon the prior beliefs, knowledge, experiences, and interests of students.

f. Create and maintain a psychologically and socially safe and supportive learning environment. (CO PB Standard 3.1-3.8,4.1-4.4,5.1-5.9,6.1-6.7,7.1-7.5,8.2)

6. Curriculum. Teachers of science plan and implement an active, coherent, and effective curriculum that is consistent with the goals and recommendations of the National Science Education Standards. They begin with the end in mind and effectively incorporate contemporary practices and resources into their planning and teaching. To show that they are prepared to plan and implement an effective science curriculum, teachers of science must demonstrate that they:
a. Understand the curricular recommendations of the National Science Education Standards, and can identify, access, and/or create resources and activities for science education that are consistent with the standards.

b. Plan and implement internally consistent units of study that address the diverse goals of the National Science Education Standards and the needs and abilities of students. (CO PB Standard 2.2; Standard 3.2, 3.3, 3.4, 3.5, 3.7)

7. Science in the Community. Teachers of science relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional, and natural resources of the community in their teaching. They actively engage students in science-related studies or activities related to locally important issues. To show that they are prepared to relate science to the community, teachers of science must demonstrate that they:

a. Identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science.

b. Involve students successfully in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community. (CO PB Standard 8.1, 8.2, 8.3, 8.4, 8.5)

8. Assessment. Teachers of science construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social, and personal development. They assess students fairly and equitably, and require that students engage in ongoing self-assessment. To show that they are prepared to use assessment effectively, teachers of science must demonstrate that they:

a. Use multiple assessment tools and strategies to achieve important goals for instruction that are aligned with methods of instruction and the needs of students.

b. Use the results of multiple assessments to guide and modify instruction, the classroom environment, or the assessment process.

c. Use the results of assessments as vehicles for students to analyze their own learning, engaging students in reflective self-analysis of their own work. (CO PB Standard 1.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 6.6, 7.7)

9. Safety and Welfare. Teachers of science organize safe and effective learning environments that promote the success of students and the welfare of all living things. They require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field. To show that they are prepared, teachers of science must demonstrate that they:

a. Understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials.

b. Know and practice safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction.

c. Know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the abilities of students.
d. Treat all living organisms used in the classroom or found in the field in a safe, humane, and ethical manner and respect legal restrictions on their collection, keeping, and use. (CO PB Standard 3.8, 5.1, 5.2, 5.3, 6.1, 6.4)

10 Professional Growth. Teachers of science strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community, and profession. They have a desire and disposition for growth and betterment. To show their disposition for growth, teachers of science must demonstrate that they:

a. Engage actively and continuously in opportunities for professional learning and leadership that reach beyond minimum job requirements.
b. Reflect constantly upon their teaching and identify ways and means through which they may grow professionally.
c. Use information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth.
d. Interact effectively with colleagues, parents, and students; mentor new colleagues; and foster positive relationships with the community. (CO PB Standard 5.9, 8.1, 8.2, 8.3, 8.4, 8.5)

Colorado Department of Education Science Competencies

8.17 (2) (a) effectively articulate to students, current issues and events affecting or affected by science; age-/grade-appropriate controversial topics, from multiple science perspectives, including historical and philosophical bases; and an analytical approach to students, with clarity and without bias.

8.17 (2) (b) effectively demonstrate to students, and instruct them about the use of a wide variety of science tools; primary and secondary source materials; print resources; laboratory and natural settings; and technological resources.

8.17 (2) (c) effectively instruct students about: the design of experiments; data reporting; use of appropriate and relevant technology; interpretation of results; and the steps which may be taken in the presentation of the processes involved and the results obtained.

8.17 (2) (e) effectively integrate technology into instructional and assessment strategies, as appropriate to science education and the learner.

8.17 (2) (f) effectively instruct students about the connections between and among the various science disciplines and within other disciplines, where relevant and appropriate.

8.17 (2) (g) effectively demonstrate for and instruct students about, the basic elements of the nature of science, including, but not limited to: inquiry, curiosity, discovery, openness to new ideas, and skepticism.

8.17 (2) (h) effectively communicate to students about the historical and dynamic nature of science.
8.17 (2) (i) demonstrate, for students, the connection between an inquiry-based lesson and a larger conceptual-based module, and the linkage of both to state-approved student science content standards.

8.17 (2) (j) effectively demonstrate, and instruct to students about, the linkage(s) between curriculum, instruction, and assessment, as related to state-approved student science content standards.

8.17 (2) (k) effectively demonstrate, and instruct to students about, safety considerations in science instruction and in the science classroom, including, but not limited to:

8.17 (2) (k) (i) proper use, storage, and disposal or maintenance of biological, chemical, and scientific equipment, and specimens, and is able to:

8.17 (2) (k) (ii) instruct and supervise students in the proper preparation and use of laboratory equipment and materials.

8.17 (2) (k) (iii) evaluate laboratory settings, equipment, materials and procedures, to identify and manage the resolution of potential safety hazards.

8.17 (2) (k) (iv) provide solutions to equipment problems, with the ability to make minor adjustments in the operation of equipment.

8.17 (2) (l) incorporate, into planning, information related to state and federal regulations, legal issues, and guidelines pertaining to scientific materials and specimens.

**ISTE (International Society for Technology in Education) NETS (National Education Technology Standards) Performance Indicators:**

Content and assignments in CURR 5493 are designed to satisfy the following ISTE NETS for Teachers performance indicators:

Effective teachers model and apply the National Educational Technology Standards for Students (NETS•S) as they design, implement, and assess learning experiences to engage students and improve learning; enrich professional practice; and provide positive models for students, colleagues, and the community. All teachers should meet the following standards and performance indicators. Teachers:

1. **Facilitate and Inspire Student Learning and Creativity**

Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments. Teachers:

   a. promote, support, and model creative and innovative thinking and inventiveness.
   b. engage students in exploring real-world issues and solving authentic problems using digital tools and resources.
   c. promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.
d. model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.

2. Design and Develop Digital-Age Learning Experiences and Assessments

Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S. Teachers:

a. design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.
b. develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.
c. customize and personalize learning activities to address students’ diverse learning styles, working strategies, and abilities using digital tools and resources.
d. provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching.

3. Model Digital-Age Work and Learning

Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society. Teachers:

a. demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.
b. collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.
c. communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital-age media and formats.
d. model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.

4. Promote and Model Digital Citizenship and Responsibility

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices. Teachers:

a. advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.
b. address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources.
c. promote and model digital etiquette and responsible social interactions related to the use of technology and information.
d. develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital-age communication and collaboration tools.
5. Engage in Professional Growth and Leadership

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources. Teachers:

a. participate in local and global learning communities to explore creative applications of technology to improve student learning.

b. exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.

c. evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.

d. contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community.

National Council for Accreditation of Teacher Education (NCATE) Standards:

Standard 1: Candidate Knowledge, Skills, and Professional Dispositions

Candidates preparing to work in schools as teachers or other school professionals know and demonstrate the content knowledge, pedagogical content knowledge and skills, pedagogical and professional knowledge and skills, and professional dispositions necessary to help all students learn. Assessments indicate that candidates meet professional, state, and institutional standards.

Standard 2: Assessment System and Unit Evaluation

The unit has an assessment system that collects and analyzes data on applicant qualifications, candidate and graduate performance, and unit operations to evaluate and improve the performance of candidates, the unit, and its programs.

Standard 4: Diversity

The unit designs, implements, and evaluates curriculum and provides experiences for candidates to acquire and demonstrate the knowledge, skills, and professional dispositions necessary to help all students learn. Assessments indicate that candidates can demonstrate and apply proficiencies related to diversity. Experiences provided for candidates include working with diverse populations, including higher education and P-12 school faculty, candidates, and students in P-12 schools.

Standard 5: Faculty Qualifications, Performance, and Development

Faculty are qualified and model best professional practices in scholarship, service, and teaching including the assessment of their own effectiveness as related to candidate performance. They also collaborate with colleagues in the disciplines and schools. The unit systematically evaluates faculty performance and facilitates professional development.
COURSE EXPECTATIONS:

Technology Competencies: It is expected that students begin our program with foundational technology skills that include digital word processing, digital and online formats (e.g. Blackboard) and using online research databases. Knowledge of the use of technology-supported multimedia, such as PowerPoint and other audio/video resources, is expected. Students who need assistance with building technological skills should speak with their professor to learn about technology resources in the COE and at UCCS.

Using your UCCS email account is a requirement of this course due to digital delivery of course content. All students must obtain a UCCS email address and check it regularly (every day) so as not to miss announcements. If your UCCS email address is not your primary one, please have emails from UCCS rerouted to the one you check daily.

Attendance, Preparation, and Participation: Students are expected to maintain high standards of ethical and professional conduct. This includes attending class, being adequately prepared, contributing to class discussions, submitting high caliber work and representing your own work fairly and honestly. As an important member of a classroom community, attendance and punctuality is mandatory. You must actively engage in class and group work to maximize your learning in this course.

If you must miss a class, please inform the professor by phone or email prior to class. It is the responsibility of the student to obtain course information that is missed during the absence. Unexcused absences will result in a lower grade.

Professional Behavior: Professional behavior is necessary for you to be a successful member of a learning community. Please monitor your participation in class discussions and group work and find ways to contribute intelligently to the discussion without silencing others. All written assignments must be computer generated unless otherwise indicated by the professor. Professional behavior will be expected in your future teaching/counseling career and is often the hallmark of career success.

Diversity Statement: The faculty of the College of Education is committed to preparing students to recognize, appreciate, and support diversity in all forms – including ethnic, cultural, religious, gender, economic, sexual orientation and ability – while striving to provide fair and equitable treatment and consideration for all. Any student who believes that he/she has not been treated fairly or equitably for any reason should bring it to the attention of the instructor, Department Chair or the Dean of the College of Education.

Accommodations: The College of Education wishes to fully include persons with disabilities in this course. In compliance with section 504 and the Americans with Disabilities Act (ADA), UCCS is committed to ensure that “no otherwise qualified individual with a disability ... shall, solely by reason of disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity...” If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to
contact and register with the Disabilities Services Office, and provide them with documentation of your disability, so they can determine what accommodations are appropriate for your situation.

To avoid any delay in the receipt of accommodations, you should contact the Disability Services Office as soon as possible. Please note that accommodations are not retroactive and disability accommodations cannot be provided until a “Faculty Accommodation Letter” from the Disability Services office has been given to the professor by the student. Please contact Disability Services for more information about receiving accommodations at Main Hall room 105, 719-255-3354 or dservice@uccs.edu.

Military Students: Military students who have the potential to participate in military activities including training and deployment should consult with faculty prior to registration for any course, but no later than the end of the first week of classes. At this time, the student should provide the instructor with a schedule of planned absences, preferably signed by the student’s commander, in order to allow the instructor to evaluate and advise the student on the possible impact of the absences.

In this course, the instructor will consider absences due to participation in verified military activities to be excused absences, on par with those due to other unavoidable circumstances such as illness. If, however, it appears that military obligations will prevent adequate attendance or performance in the course, the instructor may advise the student to register for the course at another time, when she/he is more likely to be successful.

Student Appeals: Students enrolled in programs or courses in the College of Education may access the COE Appeal/Exception Form at: http://www.uccs.edu/Documents/coe/studentresources/AppealsForm2009.pdf. This form is to be used for an appeal when a student is:
(1) denied admission to professional education program
(2) denied permission to student teach or complete professional internship
(3) removed from a professional education program or internship
(4) denied permission to graduate due to missing requirements
(5) requesting an exception to specific policies, procedures, or requirements
(6) requesting a grade change
This form is not to be used for requests to take classes out of sequence or to take a class without the proper prerequisites. Such requests should be initiated with the department chair.

UCCS Student Code of Conduct: The purpose of the Student Code of Conduct is to maintain the general welfare of the university community. The university strives to make the campus community a place of study, work, and residence where people are treated, and treat one another, with respect and courtesy. http://www.uccs.edu/~oja/student-conduct/student-code-of-conduct.html

ASSIGNMENTS/GRADING POLICY:

Journal Entries… 6 entries X 5pts = 30 pts.
Each entry will be unique and focus on the weekly topic of the course. Topics include:

1. Connections of district/state standards
2. Journal reflection about a lesson taught using a different method of instruction
3. Lesson objectives list
4. Personal definition of active learning strategies and reflection of incorporation into the classroom.
5. Summary of articles researched regarding inquiry and questioning techniques.
6. List of educational science technologies your school currently utilizes. Research and add two new items to the list.
7. List of ways to assess rather than traditional pre-/post-tests.
8. Reflection of classroom management techniques. How they have changed over the semester.

Mini Projects… 4 projects X 20 pts/project = 80 pts.
These projects will demonstrate your skills and understanding of the topics. There are briefly described as follows:

1. Design a lesson that addresses common misconceptions within your subject area. You may either pick one misconception or write a lesson that focuses on misconceptions in general. A template of the lesson plan will be given.
2. Science Department Safety Plan—You will research your school safety plan. Writing a 1-2 page summary of the plan, you will describe what the plan is and how it operates.
3. Design a lesson that addresses differentiation in the classroom. The lesson will follow the lesson rubric, but specific grading emphasis will be placed upon how you will modify the lesson to meet specific needs.
4. Create a pre-/post-assessment that focuses on active-learning strategies and incorporates differentiation.

SECONDARY SCIENCE UNIT… Unit Lesson Plan (40 pts.)
Using the TaskStream template, develop a plan for a unit you intend to teach. A unit is typically a 7-10 day course of instruction on a particular topic. It may be based on a textbook chapter or any other division in place at your school. Include detailed assessments, both formative and summative, and a variety of instructional strategies. Make sure to explain how your instruction is differentiated for a variety of learners.
Grading Scale:

- 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+ 67-69
- D 64-66
- D- 60-63
- F 59 and below

ADVICE, HOPES, and EXPECTATIONS

- The art and science of teaching science is a lifelong pursuit. The time available to us in this class is miniscule compared to the time you will devote to your profession. As your instructor I will select and use examples of what has worked for me. My hope is that through carefully chosen examples, you will become a better artist and practitioner of science teaching. Hopefully we all will be richer for the experience!
- You should be able to use standards and testing to guide, but not drive, your planning for student learning. Put standards and testing in a perspective that they are the cart but the not the horse. You are the expert. Do what you know is right. Standards and testing will follow your lead.
- You should recognize that textbooks are but one resource for both the teacher and student. While texts provide some structure for learning they cannot maintain student interest and focus on the science content and processes you need to teach. Look at and use resources beyond the textbook.
- Reach out to the community as a resource for science teaching. There are people, places, and things that are waiting to be tapped as real science that will captivate students and show them examples of both the art and science of science.
- Demonstrate to students that science, technology, engineering, and mathematics walk hand in hand. The line between disciplines is a “fuzzy band” that demands to be filled. Fill that band with examples of how we do things as “generalists” first, then as specialists.
- Do not try to do it all by yourself. Show an interest in what others in your department are doing. Get to know staff in math, English, social studies, instructional technology, physical education, home science, and fine arts. Administrators, counselors, and custodians are part of the team. Keep parents informed. Ask your students what is working and what is not working. No one person has all the answers.
### ASSIGNMENTS/GRADED ACTIVITIES

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<tr>
<th><strong>Week 1: 8/20/12</strong></th>
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<tr>
<td><strong>Readings/Assignments to do prior to the first week of class:</strong></td>
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<tr>
<td>- Buy textbook</td>
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<tr>
<td>- Print syllabus —skim to familiarize yourself with major components</td>
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<td>- Set up a large (at least 2”) binder with at least 5 tabbed dividers</td>
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<tr>
<td><strong>Class content:</strong></td>
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<tr>
<td>- Syllabus</td>
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<td>- Course expectations</td>
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<tr>
<td>- Using Blackboard</td>
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<td>- Completing assignments, required reading, etc.</td>
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<tr>
<td><strong>Homework for next week (see Blackboard for necessary attachments):</strong></td>
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<td>- Print the following from <a href="http://www.cde.state.co.us/cdeassess/UAS/CoAcademicStandards.html">http://www.cde.state.co.us/cdeassess/UAS/CoAcademicStandards.html</a> : pp. 9, 11, 13-24; then choose one standard to print (Physical Science pp. 27-50, Life Science pp. 51-82; Earth Science pp. 83-109)</td>
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<tr>
<td>- Print any science curriculum documents available from your district (e.g. scope and sequence, pacing guides, etc.)</td>
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<tr>
<td>- Read Ch. 1 and 2 (pgs. 25-33.)</td>
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<th><strong>Week 2: 8/27/12</strong></th>
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<tr>
<td><strong>Class content:</strong></td>
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<tr>
<td>- Understanding the Colorado Academic Standards for Science</td>
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<td>- Understanding your district’s curriculum</td>
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<td><strong>Homework for next week:</strong></td>
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<tr>
<td>- Journal Activity: Connections of district/state standards <strong>Due: 9/1/2012</strong></td>
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<td>- Read Ch. 8.</td>
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<th><strong>Week 3: 9/3/12</strong></th>
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<tr>
<td><strong>LABOR DAY WEEK</strong></td>
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<tr>
<td><strong>Homework for the next week:</strong></td>
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<tr>
<td>- Journal Activity: Lesson reflection-using a different method of instruction. <strong>Due: 9/8/2012</strong></td>
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<th><strong>Week 4: 9/10/12</strong></th>
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<td><strong>Class content:</strong></td>
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<tr>
<td>- Misconceptions in science (importance of identifying and addressing them) using the following articles:</td>
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<tr>
<td>- Idea Bank: Assessing Basic Knowledge in Biology</td>
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<td>- Addressing Misconceptions</td>
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<td>- Idea Bank: Changing Misconceptions</td>
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<tr>
<td>- Misconceptions List of Topics</td>
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<td>- Constructing Meaning</td>
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<tr>
<td><strong>Homework for next week:</strong></td>
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<tr>
<td>- Mini Project #1 (Upload in TaskStream, AND in Blackboard assignments folder) <strong>Due: 9/15/2012</strong></td>
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<td>- Print these articles:</td>
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<td>- Active Learning Strategies</td>
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<td>Week 5: 9/17/12</td>
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<td><strong>Class content:</strong></td>
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<tr>
<td>- Chapters 13 “Models for Effective Science Teaching” and 14 “Planning for Effective Science Teaching”</td>
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<td>- Student engagement using the following articles:</td>
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<td>- Active Learning Strategies</td>
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<td>- Energizing Students: Maximizing Student Attention and Engagement in the Science Classroom</td>
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<tr>
<td>- Using discrepant events in the science classroom—using the following articles:</td>
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<tr>
<td>- Discrepant Events</td>
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<tr>
<td>- Motivate the Unmotivated with Scientific Discrepant Events</td>
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<tr>
<td>- Discrepant Events in Physical Science: Presentation at Michigan Science Teachers Association</td>
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<td>- Teaching about the nature of science—using the following resources:</td>
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<tr>
<td>- The Prepared Practitioner: What is an Experiment?</td>
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<td>- Experimental Design Diagram</td>
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<tr>
<td>- Design Detective</td>
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<tr>
<td>- Mini Project #1 Review</td>
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<tr>
<td><strong>Homework for next week (see Blackboard for necessary attachments):</strong></td>
</tr>
<tr>
<td>- Journal Activity: Personal definition of Active Learning Strategies and incorporation into the classroom. <strong>Due: 9/22/2012</strong></td>
</tr>
<tr>
<td>- Read Ch. 4 and 17</td>
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<tr>
<th>Week 6: 9/24/12</th>
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<tbody>
<tr>
<td><strong>Class content:</strong></td>
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<tr>
<td>- Chapter 4 “Teaching Science as Inquiry” and Chapter 17 “Questioning and Discussion”</td>
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<tr>
<td>- Activity 4-1 and Activity 17-1</td>
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<tr>
<td>- Scaffolding learning from concrete (lower level) to abstract (higher-level) thinking—using the following resources:</td>
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<tr>
<td>- The Three Story Intellect</td>
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<td>- Costa’s Levels of Questioning: Science</td>
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<td>- Cornell Notes (CN) examples</td>
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<tr>
<td>- Vocabulary: Costa’s Levels of Thinking and Questioning/Tips for Studying with Notes</td>
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<tr>
<td><strong>Homework for next week (see Blackboard for necessary attachments):</strong></td>
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<tr>
<td>- Read Ch. 16</td>
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<th>Week 7: 10/1/12</th>
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<tr>
<td><strong>Class content:</strong></td>
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<tr>
<td>- Chapter 16: “The Laboratory and Demonstrations”</td>
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<tr>
<td>- Mini Project #2-Safety Plan-Review School Safety Plan</td>
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<tr>
<td><strong>Homework for next week (see Blackboard posting for necessary attachments):</strong></td>
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<tr>
<td>- Mini-Project #2 <strong>Due 10/6/2012</strong></td>
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<tr>
<td>- Read Ch. 11</td>
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</table>
Week 8: 10/8/12

**Class content:**
- Chapter 11 “Integrated Approaches to the Science Curriculum”
- Issues-based science instruction—using the following resources:
  - The Prepared Practitioner: Historical Perspectives
  - Using Issues-based Science in the Classroom
  - "New Science" and Societal Issues
- Problem/project-based science instruction—using the following resources:
  - Problem-based Learning Tools
  - Project-based Science Instruction: A Primer
  - Planning for Success: How to design and implement project-based science activities
  - The Driving Question Board
  - Increasing the Drive of Your Physics Class

Week 9: 10/15/12

**Class content:**
- Chapter 18: “Educational Technology in the Science Classroom”
- Research current school science technologies

**Homework for next week:**
- Journal Activity: List of current school science technologies and additions. Explain how your new additions will enhance education at your school. **Due 10/20/2012**
- Read Ch. 19 and 20

Week 10: 10/22/12

**Class content:**
- Chapter 19: “Individual Differences in Science Classrooms”
- Chapter 20: “Teaching Science for Differences: Gender and Cultural”
- Individual differences in science classrooms using the following materials
  - Teaching Students with Learning Differences
  - Helping Students with Learning Disabilities Succeed
  - Assistive Technology in the Inclusive Science Classroom
  - Oceanography for the Visually Impaired
- Discuss instructional unit due Week 16 and Unit Rubric that will be used to assess it

**Homework (see Blackboard for necessary attachments):**
- Mini Project #3-Differentiated Lesson Plan (Upload in TaskStream, AND in Blackboard assignments folder) **Due: 10/27/2012**
- Begin working on instructional unit due Week 15 or 16

Week 11: 10/29/12

**Class content:**
- Chapter 9: “Assessment of Student Learning”
- TCAP Frameworks

**Homework:**
- Journal Activity: List of ways to assess rather than traditional pre-/post-tests
- Work on instructional unit due Week 15 or 16
<table>
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<tr>
<th>Week</th>
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<th>Class content</th>
<th>Homework</th>
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</table>
| 12       | 11/5/12    | **Class content:** Chapter 9: “Assessment of Student Learning” (Continued)     | **Homework:**  
- Read Ch. 21  
- Mini Project #4- Create a pre-/post-assessment that focuses on active-learning strategies and incorporates differentiation. (Upload in TaskStream, Blackboard assignments folder AND in threaded discussion) **Due 11/10/2012**  
- Work on instructional unit due Week 15 or 16                                                                 |
| 13       | 11/12/12   | **Class content:** Chapter 21: “Classroom Management and Conflict Resolution” | **Homework:**  
- Journal Activity: Reflection of classroom management techniques: how they have changed over the semester. **Due: 11/17/2012**  
- Work on instructional unit due Week 16                                                                 |
| 14       | 11/19/12   | **THANKSGIVING BREAK -- NO NEW ASSIGNMENTS THIS WEEK**                         |                                                                                                                                            |
| 15       | 11/26/12   | **Class content:** Chapter 15: Designing an Effective School Science Program   | **Homework:**  
- Work on instructional unit due Week 16                                                                 |
| 16       | 12/3/12    | **Class content:** Instructional unit revisions and modifications              | **Homework:**  
- Instructional Unit **Due: 12/8/2012**                                                                                                    |
| 17       | 12/10/12   | **Class content:** Instructional Unit Review                                   |                                                                                                                                            |