AUBURN UNIVERSITY
SYLLABUS

1. **Course Number:** CTSE 4100
Course Title: Curriculum and Teaching II: Science
Credit Hours: 4 Semester Hours
Prerequisites: Admittance to the College of Education: Secondary Science Education Program
Corequisites: None

2. **Term:** Spring 2013
Day/Time: Tuesdays 6:00pm – 7:50pm with 4.5 hours of lab each week
Instructor: Dr. Christine Schnittka
Office Address: 5072 Haley Center
Contact Information: schnittka@auburn.edu or (334) 844-8277
Office Hours: Tuesdays 4:30pm – 6:00pm and by appointment

3. **Texts:** None required. Readings will be provided through ***Canvas***.

This course will require the use of the learning management system, ***Canvas*** which can be accessed from the Auburn University website (www.auburn.edu). An orientation can be provided by the Secondary Education Program.

4. **Course Description:**

The prospective science teacher will develop or deepen the skills of planning, teaching, management and evaluation necessary for successfully teaching diverse learners in the secondary science classroom. The course will include a hands-on lab to be undertaken in local area schools. Students will select, plan and demonstrate various teaching strategies in the field under the guidance of mentor teachers. In addition to planning and teaching strategies, the course will include and students will apply concepts related to: learning in science, classroom management, assessment, diversity/equity, lab safety and inquiry-based science.

5. **Course Objectives:**

The course has been organized into four strands that roughly correspond to categories of teacher competencies outlined in the Alabama Quality Teaching Standards. These four strands include: organization and classroom management; knowledge about science learning; instructional strategies; and assessment. I have translated a portion of the Alabama Quality Teaching Standards into specific learning outcomes for this course as follows. On completion of this course, you will be able to:

Strand One: Organization and Management	Possible Assignment
1. Write meaningful and clear learning outcomes for students in science based on the ACOS. (2B1)	Corrected classwork examples or collected examples from lesson plans.
2. Create detailed planning documents (lesson plans) that reflect knowledge of Alabama Teacher Quality Standards. (2B6)	A lesson plan sample that highlights some aspects of ATQS
3. Write a laboratory safety plan that reflects knowledge of safety norms in the science lab. (2C1)	This will be a homework assignment
4. Plan meaningful science learning activities that promote engagement and optimize student behavior. (2C5)	Choose an observation feedback that highlights the engagement of students.
5. Describe specific strategies for promoting positive relationships with students. (2C3 and 2C4)	This will be a journal topic
Strand Two: Knowledge about Science Learning	
1. Demonstrate ability to assess learners' preconceptions, assumptions, and prior knowledge about science content, and use these ideas as a basis to introduce new subject matter. (1A3)	This will be a lab assignment- to use probes to assess prior knowledge and plan instruction around it.
2. Apply concepts regarding the nature of cognition and metacognition in science to planning and teaching. (2A5)	Homework assignment creating a constructivism speech
Strand Three: Instructional Strategies	
1. Plan and teach in a way that demonstrates an understanding of the curriculum content as stated in the ACOS and the ability to design meaningful instruction to meet the curriculum objectives. (1B2, 1B3 and 1B6)	Choose a lesson plan and observation feedback that highlights standards-based instruction.
2. Design ways to organize and present content so that it is meaningful to students (pedagogical content knowledge). (1A2)	Design a lesson that follows the 5E Learning Cycle
3. Demonstrate knowledge of research and theory by creating or adapting and using at least two of the following research-based instructional strategies, cooperative and collaborative learning, inquiry-based science, problem-based learning, questioning techniques, reading and writing in science, and whole class interactive instruction. (2B9, 2D1, 2D2, 2D7, 2D9, and 2D10)	Choose two lesson plans that match these strategies
4. Make choices of content and learning activities that reflect developmental appropriateness for diverse learners. (2D6)	Choose a lesson plan that includes differentiated instruction
5. Demonstrate effective integration of reading, writing, and mathematics into science instruction. (3B3 and 3C6)	Choose a lesson plan that integrates reading, writing, or math
6. Plan for accommodations, modification, and/or adaptations to the general curriculum to meet the needs	This will be a journal entry that reflects on how you meet

of individual learners in science. (1B2)	individual learners' needs
Strand Four: Assessment	
1. Discuss the purposes, strengths and limitations of formative and summative assessment. (2E1)	This will be a reading reflection homework assignment
2. Explain the relationship between assessment and learning and show how to integrate assessment into various stages of the learning process. (2E2)	This will be a reading reflection homework assignment
3. Demonstrate the beginning of the ability to adjust instruction based on formative assessment. (2B8)	This is a lab assignment
4. Demonstrate knowledge of measurement related issues including validity, reliability, bias, norms, and Alabama testing procedures. (2E3 and 2E4)	This is a homework assignment. You will watch some videos and read some info on Alabama testing and write about it.
5. Create assessment rubrics in science and be prepared to teach students how to use them. (2E6)	This is a lab assignment
6. Engage students in self and peer assessment in science. (2E7)	This is a lab assignment

6. **Course Content:**

Date	Topic
1/15	Orientation and overview on the art of teaching science. Discrepant events.
1/22	Lesson plans and objectives. ACOS. 5E Learning Cycle
1/29	Inquiry in the classroom. ExploreLearning
2/5	Nature of Science and Safety in Science.
2/12	Theories of learning. Assessment to guide learning.
2/19	Next Gen Science Standards. A taste of engineering.
2/26	Engagement and motivation (MUSIC Model)
3/5	A variety of teaching strategies including field trips
3/12	AU Spring Break—NO CLASS Tuesday. Attend lab if at all possible.
3/19	Differentiation and math/reading integration
3/26	(Reminder: No Lab this week) Formative and Summative assessment
4/2	Discipline and classroom management
4/9	Rubrics and Test Measurement
4/23	Review for Final Exam

*****Note: These topics are subject to change. Always check Canvas for the current topics and assignments.**

7. Course Requirements/Evaluation:

A. **Outreach experience** (10 points)- In keeping with the outreach spirit of our university, you are required to complete a minimum of four hours of service with a school-based or campus-based science program. Some options include: AMSTI, GUTS,DAMES, Spring YES camp, or activities going on at the school where you are doing your placement (see COSAM outreach activities on AU website). You will type up your own documentation sheet, indicating the name of the program, the dates and times of attendance, and what you did. The coordinator or leader of the program needs to sign this form. Outreach documentation forms due on April 23.

B. **Reflective journal** (20 points)- You will write a reflective journal entry for each day you spend out in the field placement, starting with the first day. Each entry should be a couple of good paragraphs, or about 300-400 words. Rather than recount each thing you did during the placement day, you should pick one or more incidents and reflect on their meaning. We will discuss what constitutes "reflection" in class. Sample guiding questions will be provided. Reflective journals will be graded on the criteria of effort, depth of reflection, evidence of problem solving and analysis. Reflective journals are due each week on Canvas and feedback will be provided.

C**. Lesson Plans** (20 points) Four lesson plans will be graded during the course of the semester. The dates for turning these in are flexible, but should be spaced out during February, March, and April if possible. A rubric for grading lesson plans will be provided.

D. **Reflections on Reading Assignments** (20 points) Most weeks, a reflection will be required on the assigned reading. Rubrics will be provided on Canvas for each of these assignments.

E. **Final Exam** (20 pts.)- There will be an essay final exam due via Canvas on the designated final exam day for this class (April 29). The questions will consist of the following: (1) What have been your greatest accomplishments this term in learning to teach science? (2) Describe your emerging teaching style or teaching identity. (3) What are 3 areas and/or goals for specific improvement as you go on into your internship or forward in your career. Additional questions may be included. The final exam will be graded based on a rubric containing elements for depth of reflection, clear and logical presentation, and evidence of problem solving.

F. **Final Lab Field Placement Evaluation** (20 pts.) - Total points accumulate on your evaluations for the lab portion of the course and will be numerically translated into 20 points of the course grade.

G. **End-term portfolio** (70 points) - You will construct a portfolio that demonstrates that you have accomplished each of the course learning outcomes listed in section 5 of this syllabus. The portfolio will have entries each consisting of (a) a clear designation of which learning outcome or outcomes the entry is addressing; (b) an artifact that demonstrates achievement of the specific learning outcome; (c) a reflective paragraph(s) that explains why you chose that artifact and specifically how it demonstrates achievement of the learning outcome.

You should choose from the following artifacts to demonstrate your achievement:

- Lesson plans
- Handouts, activity guidelines, Powerpoints, quizzes, worksheets, lab sheets, etc. prepared to go with lesson plans
- Science safety plan
- Reflective journal entries
- Final lab field placement evaluation
- Class notes/exercises
- Video segments of yourself teaching
- Other artifacts from the semester

You can use one entry to demonstrate anywhere from 1-3 learning outcomes. A rubric will be provided. Portfolio due: April 29

8. **Professionalism and Participation** (20 points). Attending class, attending lab sessions, dressing appropriately, and behaving as a professional teacher in these settings is a very important aspect of this course. You are expected to keep your cell phones out of sight, contribute constructively to class discussions and activities, plan with your cooperating teacher, and use your lab time to its fullest potential.

Any assignment presented or turned in late will be penalized 10% for each day late. Late assignments presented or turned in late after two days will not be accepted without prior approval of the instructor.

The final grade will be determined by the following grading scale:
A = 90 -100, B = 80-89, C = 70-79, D = 60-69, F = below 60%

Note: Although it is possible to make a grade of "D" in this class, a student receiving any grade below "C" must retake the class to matriculate through the program and gain certification.

AU eValuate Fall Semester evaluation dates:
Open: April 20, 2013 (8:00 am)
Close: April 28, 2013 (11:59pm)

9. Class Policy Statements:

Participation: Students are expected to participate in all class discussions and participate in all exercises. It is the student's responsibility to contact the instructor if assignment deadlines are not met. Students are responsible for initiating arrangements for missed work.

Attendance/Absences: Attendance is required at each class meeting. If an exam is missed, a make-up exam will be given only for University-approved excuses as outlined in the Student Policy Handbook www.auburn.edu/studentpolicies . Arrangement to take the make-up exam must be made in advance. Students who miss an exam because of illness need a doctor's statement for verification of sickness and should clear the absence with the instructor the day

they return to class. Other unavoidable absences from campus must be documented and cleared with the instructor **in advance**.

Unannounced quizzes: There will be no unannounced quizzes.

Accommodations: Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).

Honesty Code: The University Academic Honesty Code and the Student Policy Handbook Rules and Regulations pertaining to Cheating will apply to this class.

Professionalism: As faculty, staff, and students interact in professional settings, they are expected to demonstrate professional behaviors as defined in the College's conceptual framework. These professional commitments or dispositions are listed below:

- Engage in responsible and ethical professional practices
- Contribute to collaborative learning communities
- Demonstrate a commitment to diversity
- Model and nurture intellectual vitality

***THIS SYLLABUS IS A WORK IN PROGRESS AND IS SUBJECT TO CHANGE ***
What follows is the collection of assignments from spring 2013 taken from Canvas.

Module 1: Lesson plans and objectives (Due 1/22/13)

This module is about lesson plans, writing learning objectives, using the Alabama Course of Study for lesson planning, and using the 5-E Learning Cycle for lesson planning. Several readings are required for this module which can be accessed online You may have to use the library online journals. I will upload here what cannot be accessed online.

Read:

Bowen, L. (n.d.) *The 5E model of instruction*. Lexington, KY: Fayette County Public Schools.

Arreola, R. A. (1998). Writing learning objectives: A teaching resource provided from the Office of the Vice Chancellor for Planning and Academic Support. Available from http://www.uwo.ca/tsc/pdf/LearningObjectivesArreola.pdf

Access and review:

Alabama Course of Study: http://alex.state.al.us/browseSC.php

Sample Lesson Plan with Comments

Lesson Plan Rubric

Journal entry

Edit

Describe meeting your lab teacher. What were your impressions?

Points 10

Submitting a file upload

Due	For	Available from	Until
Jan 22 at 6pm	Everyone	-	-

Initial meeting

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Describe the classroom and your impression of it.	Full Marks 5 pts	No Marks 0 pts	5 pts
Describe your interactions with the teacher and your impression of the teacher.	Full Marks 5 pts	No Marks 0 pts	5 pts
			Total Points: 10

Assignment: The 5E Lesson

Edit

1. Describe the way you have traditionally been taught science in high school and college classrooms. What would the "learning cycle" be for a typical high school or college science class?

2. Pick a topic you might want to teach and roughly sketch out what might take place in each of the 5Es of the Learning Cycle.

3. Research shows that the 5E Learning Cycle helps students learn new ideas. http://www.bscs.org/bscs-5e-instructional-model

Why do you think it does this?

Points 20

Submitting a file upload

Due	For	Available from	Until
Jan 22 at 6pm	Everyone	-	-

5E Lesson Rubric

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Typical instruction is described in at least 5 sentences	Full Marks 5 pts	No Marks 0 pts	5 pts
A learning cycle for typical instruction is created	Full Marks 5 pts	No Marks 0 pts	5 pts
Each phase of the 5Es is described in enough detail that the reader can visualize the phase.	Full Marks 5 pts	No Marks 0 pts	5 pts
Personal rationale for how you think the 5E Cycle helps learners is described in at least 5 sentences	Full Marks 5 pts	No Marks 0 pts	5 pts
			Total Points: 20

Module 2: Inquiry (Due 1/29/13)

A major theme this semester will be teaching through inquiry. For this module, I want you to write out what you think inquiry teaching is, then read an article from The Science Teacher, and then write about how your ideas of inquiry have changed.

The article:

Bell, R., Smetana, L, & Binns, I. (2005). Simplifying inquiry instruction. *The Science Teacher, 72(7)*30-33.

can be found by going to the library online: http://www.lib.auburn.edu/ and then clicking on e-Journals and searching for The Science Teacher.

You will get a choice: Education Research Complete. Click on it and use the + signs at the right to find volume 72 issue 7 of The Science Teacher from 2005.

This past week you went to your lab placement with the goal of observing and helping. See assignment (due Friday January 25 if possible).

Assignment: Correct a lesson plan

Edit

Now that you know about the 5E Learning Cycle, how to write objectives with the condition, behavior, and criteria, and what components of a lesson plan are critical, take the attached lesson plan and correct it as if you were a mentor teacher helping a lab student prepare. Ideally, correct the Word document using Track Changes. If you can't do that, then make sure your corrections are bolded or in a different text or color.

Lesson Plan to correct.docx

Points 20

Submitting a file upload

Due	For	Available from	Until
Jan 29 at 6pm	Everyone	-	-

Correct a lesson plan

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Lesson has been formatted in the 5E Learning Cycle	Full Marks 5 pts	No Marks 0 pts	5 pts
Objectives have a condition, behavior, and criteria	Full Marks 5 pts	No Marks 0 pts	5 pts
Assessments match objectives	Full Marks 5 pts	No Marks 0 pts	5 pts
Procedures have added details	Full Marks 5 pts	No Marks 0 pts	5 pts
		Total Points: 20	

Assignment: Inquiry Reflection

Edit

Before reading the article about inquiry, answer this question:

1. What do you think it means to teach using inquiry?

After reading the article, answer this question?

2. How have your ideas about teaching through inquiry changed?

Points 10

Submitting a file upload

Due	For	Available from	Until
Jan 29 at 6pm	Everyone	-	-

Inquiry reflection

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Pre-conceptions about inquiry are described in 3-5 sentences	Full Marks 5 pts	No Marks 0 pts	5 pts
New conceptions about inquiry are described in 5-10 sentences using content from the Bell et al. (2005) article.	Full Marks 5 pts	No Marks 0 pts	5 pts
			Total Points: 10

Journal Entry

Edit

OBSERVATION GUIDE.docx 

This week you went to your placement and observed and helped. You should have started answering some of the questions I handed out in class the first session. Respond in this journal entry with some of the answers- observations of the classroom and interview answers from the lab teachers. The entire observation assignment will be due next week.

Points 10

Module 3: Nature of Science (Due 2/5/13)

This week's module is on teaching with the Nature of Science in mind.

Here are the readings:

McComas, W. F. (1996). Ten myths of science: Reexamining what we think we know about the nature of science. *School Science and Mathematics, 96*, 10-16.

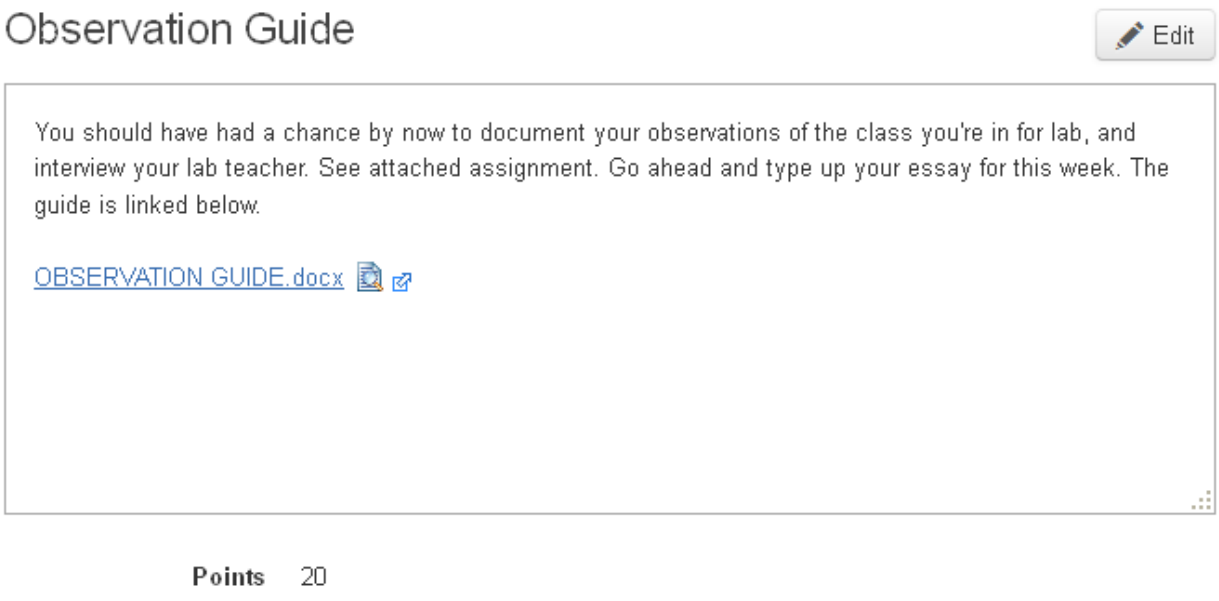
National Academy of Science (1998). Teaching about evolution and the nature of science. Washington, D.C.: National Academy Press. (hardcopy at bookstore) Online at: http://books.nap.edu/books/0309063647/html/1.html

Read Chapter 1 (pages 1-9) very carefully.

(You can try to get a free copy of the book from the Alabama Academy of Science: http://alabamaacademyofscience.org/teaching%20about%20evolution.php)

After reading these two important pieces, I want you to plan a fictional dialog with a student who says to you, "I don't want to learn about evolution. It's against my religion." This will happen and you need to be prepared with a discussion and not just ignore this statement. It's a ripe teachable moment to address so many facets of the nature of science. The NAS book gives you an example, but use your own background knowledge, your own opinions, and your own way of communicating to craft this narrative. A rubric is attached to the assignment to guide you.

Also this week, turn in your observation/interview assignment.



Journal Entry

Edit

This week I expected you to work with your Lab Teacher to plan a 10 minute teaching segment. In this journal entry tell me what it was like, what you did well and what you need to work on.

Plan this 10 minute segment BEFORE the day you go out to lab. Be sure that you record exactly what you are supposed to do, and that it is approved by your lab teacher in advance. This does not have to be a formal lesson plan, but make good notes. No surprises. As soon as you know if your 10 minute segment will be at the beginning, middle, or end of the lesson, let both me and George Turner know so one of us can try to observe. Also tell us which class period(s) you will be teaching this. Email this information to get0002@auburn.edu and schnittka@auburn.edu as soon as you know.*

Evolution and the Nature of Science

Edit

Plan a fictional dialog with a student who says to you, "I don't want to learn about evolution. It's against my religion." This will happen and you need to be prepared with a discussion and not just ignore this statement. It's a ripe teachable moment to address so many facets of the nature of science. The NAS book gives you an example, but use your own background knowledge, your own opinions, and your own way of communicating to craft this narrative.

Points 20

Submitting a file upload

Due	For	Available from	Until
Feb 5 at 6pm	Everyone	-	-

Evolution and NOS

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Two pages double spaced and well written	Full Marks 5 pts	No Marks 0 pts	5 pts
Use of scientific data in the discussion	Full Marks 5 pts	No Marks 0 pts	5 pts
Use of some tenets of the Nature of Science in discussion	Full Marks 5 pts	No Marks 0 pts	5 pts
Obvious evidence that you read both the NOS paper and the book chapter	Full Marks 5 pts	No Marks 0 pts	5 pts
			Total Points: 20

Lab Placement 1

Edit

You had to teach for 10 minutes this past week. You had to have notes to guide you as you taught. Upload your notes.

Points 10

Module 4: Constructivism and conceptual change (Due 2/12/13)

This module is about constructivism and conceptual change. I want you to read three short articles first. They are each from The Science Teacher. I'll just attach them here:

Colburn 2007 Constructivism part 1.pdf

Colburn 2007 Constructivism part 2.pdf

Metz 2008 Constructivism and PBS.pdf

What does it mean to teach in a constructivist manner? After reading these article you should have a pretty good sense. So, imagine your principal stops you in the hall and says, "I heard you teach in a construtivist manner. What is that? Why do you do that?" You have two minutes to answer. Your answer should teach the principal what it is that you do and why you do it. You can record your answer on any device you want and upload an audio file. Alternatively, there is a way to record on Canvas and upload an audio file. Either way, write out your "speech" first but don't sound like you're reading a speech. Sound authentic. Convince me that you know what you're talking about!

Also, this week upload a journal entry in which you describe specific strategies you have seen your Lab teacher use to promote positive relationships with students. Then describe specific strategies YOU want to use to promote positive relationships with students.

Constructivism Speech

Edit

What does it mean to teach in a constructivist manner? After reading the articles this week you should have a pretty good sense. So, imagine your principal stops you in the hall and says, "I heard you teach in a construtivist manner. What is that? Why do you do that?" You have two minutes to answer. Your answer should teach the principal what it is that you do and why you do it. You can record your answer on any device you want and upload an audio file. Alternatively, there may be a way to record on Canvas and upload an audio file. Either way, write out your "speech" first but don't sound like you're reading a speech. Sound authentic. Convince me that you know what you're talking about!

Points 20

Submitting a file upload, a website url, or a media recording

Due	For	Available from	Until
Feb 12 at 6pm	Everyone	-	-

Some Rubric

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Recording is between 90 seconds and 120 seconds long	Full Marks 5 pts	No Marks 0 pts	5 pts
Speech clearly describes what constructivism is	Full Marks 5 pts	No Marks 0 pts	5 pts
Speech clearly describes WHY you teach with this theory in mind	Full Marks 5 pts	No Marks 0 pts	5 pts
Speech is well delivered and convincing, does not sound dry and boring.	Full Marks 5 pts	No Marks 0 pts	5 pts
		Total Points: 20	

Journal Entry

Edit

Feel free to vent, or describe your teaching experiences (struggles and victories) this week. But also do this:

Describe specific strategies you have seen your Lab teacher use to promote positive relationships with students. Then describe specific strategies YOU want to use to promote positive relationships with students.

Points 10

Lab Placement 2

Edit

This week you were again required to teach for 10-15 minutes but you had to write out an objective that contains the condition, behavior, and criteria. In order to see if you students met your objective, you need to create a very short assessment to see what percentage met your objective and analyze why you got the results you did.

For example, you want to teach students how to prepare a microscope slide with an onion sliver in it. Your criteria is that students will be able to see and identify both the cell nuclei and cell walls. So you have students draw what they see and include label all the cell parts they could see. If they draw a bunch of air bubbles, you know they did not meet your objective. If they draw squares without dots in the middle, they did not meet your objective. If they drew squares and dots, then bravo.

Points 20

Submitting a file upload

Due	For	Available from	Until
Feb 12 at 6pm	Everyone	-	-

Lab 2

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Objective contains condition, behavior, and criteria	Full Marks 5 pts	No Marks 0 pts	5 pts
Lab notes are present	Full Marks 5 pts	No Marks 0 pts	5 pts
Assessment is included and results are described.	Full Marks 5 pts	No Marks 0 pts	5 pts
Analysis of the results is provided.	Full Marks 5 pts	No Marks 0 pts	5 pts
			Total Points: 20

Module 5: Engineering in STEM education (Due 2/19/13)

This module is about integrating engineering into science teaching and learning. Also, I want you to be familiar with my work and think about how to assess for learning when you use design or project-based lessons.

First, I want you to read this article:

Schnittka, C., Bell, R., & Richards, L. (2010). Save the penguins: Teaching the science of heat transfer through engineering design. *Science Scope, 34*(3), 82-91.

As you know, you can find it in the library e-Journals.

Then, I want you to read this article that I have submitted to Science Scope, and it is under review. I hope it gets accepted.

proof for peer review.pdf

Here are a few videos you can watch to understand these two curriculum modules:

http://youtu.be/5xQ5yxt7BSM

http://youtu.be/iYXpyTEYlhs

The full versions of these curricula can be found on my website in the Engineering tab. Go to www.auburn.edu/~cgs0013 and you may find additional assessments linked there.

Your written assignment is to document all the ways I embed assessment into the engineering design curriculum (Penguins and Sea Birds) and whether you think it measures learning. Sometimes I have students do performance assessments, sometimes it's drawing or such. This satisfies Objective Strand 4.2, "Explain the relationship between assessment and learning and show how to integrate assessment into various stages of the learning process."

Finally, don't forget to create a journal entry this week.

Engineering and Assessment

Edit

Your written assignment is to document all the ways I embed assessment into the Engineering design curriculum, Save the Penguins, and Save the Sea Birds, and whether you think it measures learning. Sometimes I have students do performance assessments, sometimes it's drawing or such. Make this a list or table divided up by each module. If you have any suggestions for improving assessment, they are welcome.

Points 10

Journal Entry

Edit

Feel free to vent, or describe your teaching experiences (struggles and victories) this week.

Points 10

Lab Placement 3

Edit

We have been discussing the tenets of the Nature of Science. (See McComas's 1996 article on the Myths about Science.) This assignment is to determine which tenet(s) fit well with the content you are teaching, and embed a 15 minute lesson that involves at least one aspect of NOS. This can be a discussion about the theories and laws relevant to the content, an activity that highlights the role of observation and inference in science, an activity that highlights that there is no ONE scientific method, etc. Partners are welcome to work together on this and take turns teaching it. Please upload your lesson notes. I expect to see an objective and specific questioning strategies you will employ to get students thinking and learning about how the Nature of Science is essential in understanding the doing of science.

You are welcome to plan this lesson with your lab partner and take turns teaching it during different blocks or periods.

Points 15

Submitting a file upload

Due	For	Available from	Until
Feb 19 at 6pm	Everyone	-	-

Lab Placement 3

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Well written objective with Condition, Behavior, and Criteria	Full Marks 5 pts	No Marks 0 pts	5 pts
Lesson addresses at least one tenet of the Nature of Science	Full Marks 5 pts	No Marks 0 pts	5 pts
Specific questioning strategies are planned for in the lesson sketch	Full Marks 5 pts	No Marks 0 pts	5 pts
		Total Points: 15	

Module 6: Motivation (Due 2/26/13)

This module is about motivation. How can you motivate your students to learn and work in your class?

For some ideas, read the following:

Jones, B. D. (2009). Motivating students to engage in learning: The MUSIC model of academic motivation. *International Journal of Teaching and Learning in Higher Education, 21*(2), 272-285. Downloaded from http://www.isetl.org/ijtlhe/pdf/IJTLHE774.pdf

I want you to create something useful with the information in this article, and I want to give you some power over how you create a useful product. It could be a foldable (see http://www.catawba.k12.nc.us/C_i_resources/Foldables.htm) or a song or an essay or a Prezi (see www.prezi.com) or a mind map (see https://bubbl.us) or any other way you would like to create a useful way to remember and use what you have learned.

This week your lab assignment is to use a probe to assess student conceptions. If you did not find a published probe in one of Page Keeley's books, you need to find or create your own. It must be based on research on children's' ideas about a science topic.

As usual, create a journal entry about your work in your placement this week. Perhaps you can watch for ways your cooperating teacher does things to motive students, and things you think might back fire...

Motivation

Edit

I want you to create something useful with the information in the Jones (2009) article. In the spirit of the MUSIC model, I also want to give you some power over how you create a useful product. It could be a foldable (see http://www.catawba.k12.nc.us/C_i_resources/Foldables.htm) or a song or an essay or a Prezi (see www.prezi.com) or a mind map (see https://bubbl.us) or a website, or any other way you would like to create a useful way to remember and use what you have learned. It should include specific advice pertaining to teaching adolescents science, and it should address all five components of the model. If you create a hard-copy artifact, bring it with you to class on the due date.

Points 20

Submitting a file upload, a website url, or a media recording

Due	For	Available from	Until
Feb 26 at 6pm	Everyone	-	-

Motivation artifact

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
All five components are addressed	Full Marks 5 pts	No Marks 0 pts	5 pts
All the relevant ideas from the article are present	Full Marks 5 pts	No Marks 0 pts	5 pts
Creative presentation of ideas (something other than a typed list!)	Full Marks 5 pts	No Marks 0 pts	5 pts
The artifact is indeed useful, and could be shared with other teachers	Full Marks 5 pts	No Marks 0 pts	5 pts
		Total Points: 20	

Journal Entry

Edit

As usual, create a journal entry about your work in your placement this week. Perhaps you can watch for ways your cooperating teacher does things to motive students, and things you think might back fire...

Points 10

Lab Placement 4

Edit

Use a probe to assess student understanding, analyze the results, and plan an intervention to address the needs. (Probes will be discussed in class)

Points 15

Submitting a file upload

Due	For	Available from	Until
Feb 26 at 6pm	Everyone	-	-

Lab Placement 4

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Probe used addresses content in course	Full Marks 5 pts	No Marks 0 pts	5 pts
Results of probe are analyzed	Full Marks 5 pts	No Marks 0 pts	5 pts
Brief description of how your could teach in response to answers on probe.	Full Marks 5 pts	No Marks 0 pts	5 pts
		Total Points: 15	

Module 7: Different teaching techniques (Due 3/5/13)

This module is about different techniques to teach science.

One popular technique is **"The Field Trip."**

Read:

Schnittka, C.G. (2006). Learning lessons from estuaries. *The Science Teacher*, *73*(1), 31-35.

This was my first publication. You will find it in the library e-Journals.

Another popular technique is **"The Lecture."**

While this is my least favorite technique, sometimes it cannot be avoided. Read some ways to make the lecture interactive:

Millis Active Learning.pdf

Another popular technique is called **"The Lab."**

Labs can be described as "cook book" or "inquiry" or somewhere in between. Pick three labs that your cooperating teacher has used-- get the handouts, the directions, everything that accompanies the "labs." Analyze them using the following rubric to find out where they fall on the cook-book to inquiry spectrum.

Lab Assessment.doc

For your assessment of different techniques to teach science, create a document that lists everything you read or learned that you think is interesting, and that you will want to remember in the future when you teach science.

Journal Entry

Edit

As usual, create a journal entry about your work in your placement this week. Perhaps you can watch for ways your cooperating teacher uses different techniques to teach science.

Points 10

Techniques to Remember

Edit

FIRST read the overview and the readings.

THEN create a document that lists everything you read or learned that you think is interesting, and that you will want to remember in the future when you teach science.

Points 15

Submitting a file upload

Due	For	Available from	Until
Mar 5 at 6pm	Everyone	-	-

Techniques to Remember			
You've already rated students with this rubric. Any major changes could affect their assessment results.			
Criteria	Ratings		Pts
Field Trip Techniques view longer description	Full Marks 5 pts	No Marks 0 pts	5 pts
Lecture Techniques view longer description	Full Marks 5 pts	No Marks 0 pts	5 pts
Lab Techniques view longer description	Full Marks 5 pts	No Marks 0 pts	5 pts
			Total Points: 15

Lab Activity Assessment

Edit

Upload your lab activity assessment.

(See the module overview for a description and for the file)

Points 10

Submitting a file upload

Due	For	Available from	Until
Mar 5 at 6pm	Everyone	-	-

Some Rubric (1)

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Three labs are described and rated for inquiry	Full Marks 9 pts	No Marks 0 pts	9 pts
Labs are placed on the cookbook to inquiry spectrum correctly	Full Marks 1 pts	No Marks 0 pts	1 pts
			Total Points: 10

Lab Placement 5

Edit

Conduct an inquiry-based lab or use problem-based scenarios. There must be question and data analysis OR problem and solution/design. Upload your lesson plan. This lesson plan must include an objective and an assessment that matches it, and it must describe the inquiry question, the data students will collect, how they will analyze it, and include procedures you will take. Plan questions to use to prompt students to think deeper. Include a safety section to remind yourself of safety concerns you need to address.

Points 25

Submitting a file upload

Due	For	Available from	Until
Mar 5 at 6pm	Everyone	-	-

Lab Placement 5

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Objectives have a condition, behavior, and criteria	Full Marks 5 pts	No Marks 0 pts	5 pts
Assessments match objectives	Full Marks 5 pts	No Marks 0 pts	5 pts
Inquiry question and data analysis is present and obvious to students	Full Marks 5 pts	No Marks 0 pts	5 pts
Safety precautions are described	Full Marks 5 pts	No Marks 0 pts	5 pts
Procedures have questioning strategies	Full Marks 5 pts	No Marks 0 pts	5 pts
			Total Points: 25

Module 8: Differentiated Instruction (Due 3/19/13)

This module is about teaching with differentiation in mind.

Read: Science Differentiation Brief.pdf for an overview of what differentiation means.

Then, read: Dotger, S., & Causton-Theoharis, J. (2010). Differentiation through choice: Using a think-tac-toe for science content. *Science Scope, 77*(2), 18-23.

(You can find this article through the library e-Journals or download Dotger 2010.pdf .) This article will give you a specific technique idea that we will try in class, so be prepared.

We use differentiation to reach all types of learners. Read the following article to specifically learn a strategy to reach underrepresented groups of learners:

Behm, C. (2001). Big picture science: Uncovering teaching strategies for underrepresented groups. *The Science Teacher, 68*(3), 36-39.

(Download it here Behm 2001.pdf)

Teaching with the philosophy of differentiation can be overwhelming to a new teacher and should be planned for in advance. Reflect on the three articles you have just read, and think about the lessons you have taught this semester in your lab placement. Pick one lesson and write an essay about what you could have done differently to incorporate differentiation. If you can't think of a lesson YOU taught, reflect on one that your coopering teacher taught that you observed.

Differentiation reflection

Edit

Reflect on the three articles you have just read for this module, and think about the lessons you have taught this semester in your lab placement. Pick one lesson and write an essay about what you could have done differently to incorporate differentiation. If you can't think of a lesson YOU taught, reflect on one that your coopering teacher taught that you observed.

Points 10

Submitting a file upload

Due	For	Available from	Until
Mar 19 at 6pm	Everyone	-	-

Differentiation essay rubric

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
1-2 pages double spaced	Full Marks 3 pts	No Marks 0 pts	3 pts
Specific ideas are described to modify the lesson	Full Marks 3 pts	No Marks 0 pts	3 pts
Original lesson is described in brief	Full Marks 1 pts	No Marks 0 pts	1 pts
It is obvious that ideas are derived from the readings	Full Marks 3 pts	No Marks 0 pts	3 pts
			Total Points: 10

Journal Entry

Edit

This week for your journal reflection, I want you to describe one student you teach (use a fake name please) and the struggles that student is having in class. Then, describe what you would do if you could to help that student-- if it were your classroom. Think about what you have learned about differentiation when you write this entry. In an ideal situation, what would you do if you could to address the particular challenge that student is facing?

Points 10

Lab Placement 6

Edit

Conduct an effective whole-class demonstration using guidelines given in class. If you attempt this lab before the lesson on demos is given, see me for guidelines. Submit your lesson plan which should include:

ACOS standard

Objective

Procedures

Safety Precautions

Points 15

Submitting a file upload

Due	For	Available from	Until
Mar 19 at 6pm	Everyone	-	-

Lab Placement 6

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
ACOS Standard matches objective	Full Marks 1 pts	No Marks 0 pts	1 pts
Objectives have a condition, behavior, and criteria	Full Marks 3 pts	No Marks 0 pts	3 pts
Procedures have questioning strategies	Full Marks 5 pts	No Marks 0 pts	5 pts
Safety precautions are described	Full Marks 3 pts	No Marks 0 pts	3 pts
Informal assessment is described	Full Marks 3 pts	No Marks 0 pts	3 pts
			Total Points: 15

Module 9: Assessment (Due 3/26/13)

This module is on assessment-- formative and summative assessment.

Read:

Go to www.nsta.org and click on HIGH SCHOOL on the left. Then scroll down to the journal archives and do a search on the word, "assessment." You will find that it brings up 72 articles. Find a few that look good and then get them from the library eJournals (if you are an NSTA member you can click and read). Read what you need to in order to answer the following questions:

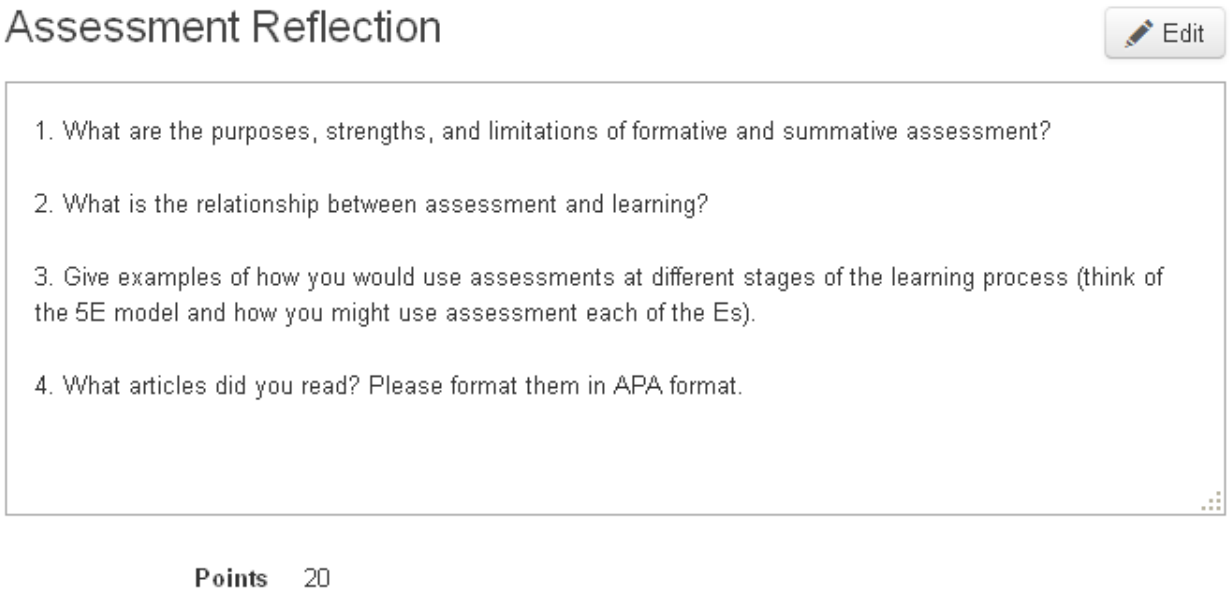
Reflect:

1. What are the purposes, strengths, and limitations of formative and summative assessment?

2. What is the relationship between assessment and learning?

3. Give examples of how you would use assessments at different stages of the learning process (think of the 5E model and how you might use assessment each of the Es).

4. What articles did you read? Please format them in APA format.



Journal Entry

Edit

This week you should really be teaching significant content and for significant periods of time. There are only a few weeks left to teach this semester and you should be "on your game" and feeling very comfortable planning and executing engaging lessons.

How do you think you are doing? Do you feel ready for internship?

What are your strengths and weaknesses at this point in the semester?

What are some goals you need to set for yourself that you can achieve by the end of April?

Did deep. Lay it all out on the table.

Points 10

Module 10: Next Generation Science Standards (Due 4/2/13)

This module is about the National Research Council's Framework for K-12 Science Education and what is happening with the development of the Next Generation Science Standards. You will read part of the "Framework" online, and come to class prepared to discuss the latest NGSS standards draft.

Lab Placement 7

Edit

Conduct a lesson that includes at least 2 of the 5E Learning Cycle phases. This should be at least 30 minutes long. You should turn in a complete lesson plan.

Points 50

Submitting a file upload

Due	For	Available from	Until
Mar 26 at 6pm	Everyone	-	-

Lesson Plan Rubric

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Alabama Course of Study objectives	Full Marks 5pts	No Marks 0pts	5 pts
Goals of the lesson	Full Marks 5pts	No Marks 0pts	5 pts
Context of this lesson	Full Marks 5pts	No Marks 0pts	5 pts
Objectives have a condition, behavior, and criteria	Full Marks 5pts	No Marks 0pts	5 pts
Materials	Full Marks 5pts	No Marks 0pts	5 pts
Safety precautions are described	Full Marks 5pts	No Marks 0pts	5 pts
Lesson Procedure	Full Marks 5pts	No Marks 0pts	5 pts
Closure	Full Marks 5pts	No Marks 0pts	5 pts
Assessments match objectives	Full Marks 5pts	No Marks 0pts	5 pts
Resources you used to create lesson	Full Marks 5pts	No Marks 0pts	5 pts

Total Points: 50

Module 11: Alabama Science in Motion (Due 4/9/13)

Do you know about ASIM? If not, get ready because we will be taking a trip in class tonight to visit some of the ASIM teachers and find out what it's all about.

Lab Placement 8

Edit

Design and teach a 30 minute lesson that integrates reading/writing or math.

Points 50

Submitting a file upload

Due	For	Available from	Until
Apr 2 at 6pm	Everyone	-	-

Lesson Plan Rubric

You've already rated students with this rubric. Any major changes could affect their assessment results.

Criteria	Ratings		Pts
Alabama Course of Study objectives	Full Marks 5pts	No Marks 0pts	5 pts
Goals of the lesson	Full Marks 5pts	No Marks 0pts	5 pts
Context of this lesson	Full Marks 5pts	No Marks 0pts	5 pts
Objectives have a condition, behavior, and criteria	Full Marks 5pts	No Marks 0pts	5 pts
Materials	Full Marks 5pts	No Marks 0pts	5 pts
Safety precautions are described	Full Marks 5pts	No Marks 0pts	5 pts
Lesson Procedure	Full Marks 5pts	No Marks 0pts	5 pts
Closure	Full Marks 5pts	No Marks 0pts	5 pts
Assessments match objectives	Full Marks 5pts	No Marks 0pts	5 pts
Resources you used to create lesson	Full Marks 5pts	No Marks 0pts	5 pts
			Total Points: 50

Module 12: Semester review (Due 4/16/13)
For this module, review the semester and get ready for the final exam.

Lab Placement 9

Edit

Design and teach a 30 minute a lesson that uses differentiation to address different learning styles.

Points 50

Submitting a file upload

Due	For	Available from	Until
Apr 9 at 6pm	Everyone	-	-

Lesson Plan Rubric

Criteria	Ratings		Pts
Alabama Course of Study objectives	Full Marks 5pts	No Marks 0pts	5 pts
Goals of the lesson	Full Marks 5pts	No Marks 0pts	5 pts
Context of this lesson	Full Marks 5pts	No Marks 0pts	5 pts
Objectives have a condition, behavior, and criteria	Full Marks 5pts	No Marks 0pts	5 pts
Materials	Full Marks 5pts	No Marks 0pts	5 pts
Safety precautions are described	Full Marks 5pts	No Marks 0pts	5 pts
Lesson Procedure	Full Marks 5pts	No Marks 0pts	5 pts
Closure	Full Marks 5pts	No Marks 0pts	5 pts
Assessments match objectives	Full Marks 5pts	No Marks 0pts	5 pts
Resources you used to create lesson	Full Marks 5pts	No Marks 0pts	5 pts
			Total Points: 50

Lab Placement 10

Edit

Create an assessment rubric to grade an assignment and give it to students prior to the assignment. Evaluate its effectiveness on student success.

Points 20

Submitting a file upload

Due	For	Available from	Until
Apr 16 at 6pm	Everyone	-	-

Lab Placement 10

Criteria	Ratings		Pts
Rubric has at least 3 categories	Full Marks 5pts	No Marks 0pts	5 pts
Rubric has at least 4 measures in each category described	Full Marks 5pts	No Marks 0pts	5 pts
Reflection on student evaluations-- How do you think having the rubric affected the outcomes?	Full Marks 5pts	No Marks 0pts	5 pts
Student outcomes described on Excel spreadsheet or table	Full Marks 5pts	No Marks 0pts	5 pts
			Total Points: 20