



## AUBURN UNIVERSITY SYLLABUS

**Course Number:** CTSE 4100  
**Course Title:** Curriculum and Teaching II: Science  
**Credit Hours:** 4 semester hours  
**Prerequisites:** Admission to the program for Teacher Education  
**Co-requisites:** None

**Date Syllabus Prepared:** January 6, 2010

Spring, 2010

Class Times: M, 11:00-12:50; W 11:00-3:15

Location: Haley Center 2462 and schools

Class Duration: January 11- May 3, 2010

Office hours: Mondays 9:00-11:00 or by appointment

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**Auburn College of Education Mission:** The mission of the College of Education is to build a better future for individuals, our state, our nation, and our world. We fulfill our mission by preparing competent, committed, and reflective professionals as we engage in outstanding teaching, cutting-edge research, and meaningful outreach.

**Please note:** Adjustments to the syllabus may be made by the instructor in response to formative assessment of the class members or other ongoing circumstances.

### Required Textbooks and Major Resources:

1. The required text is Petty, G. (2009). *Evidence Based Teaching* (second revised edition). Cheltenham, U. K.: Nelson Thomas Ltd. ISBN-10: 1408504529; ISBN-13: 978-1408504529. Various other required readings will be available on the web, as a handout or possibly through Blackboard. Please note: This newly revised edition will be available from Amazon.com starting January 12 for \$35.00. If you can find a copy of the last version (2006) used, that would be fine too.
2. Additional handouts or web-based readings may be required. Check Blackboard and your university e-mail frequently for updates.
3. Required AU name tag: Most of you have this already from last semester. Available from Ware's Jewelers (approximately \$12.00). You should wear your name tag during lab field days and other volunteer activities. Example: Ms. Parker.

4. Required materials: One or two high eight mm digital videotapes. Available in the AU university bookstore. Please check with your school for guidelines on videotaping.
5. Required curriculum: Alabama Course of Study (ACOS) Curriculum. (2005). Sections for 9-12 and 6-8 science. Please download and be ready to refer to in class. Available at Alabama Department of Education website ([www.alsde.edu](http://www.alsde.edu)).

**Optional Textbook:**

Texley, J., Kwan, T. & Summers, J. *Investigating safely: A guide for high school teachers*. Washington D. C.: NSTA Press. Available from the NSTA website science store, Member price \$19.00. I've suggested you go ahead and purchase this book now as a resource for the safety portion of the course. Proof of purchase of this book is required for the internship, so if you do get it now, save your receipt and/or keep the book.

**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.

**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**

1. Write meaningful and clear learning outcomes for students in science based on the ACOS. (2B1)
2. Create detailed planning documents (lesson plans) that reflect knowledge of Alabama Teacher Quality Standards. (2B6)
3. Write a laboratory safety plan that reflects knowledge of safety norms in the science lab. (2C1)
4. Plan meaningful science learning activities that promote engagement and optimize student behavior. (2C5)
5. Describe specific strategies for promoting positive relationships with students. (2C3 and 2C4)

### Strand Two: Knowledge about Science Learning

6. 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)
7. Demonstrate through planning and teaching the ability to relate content to other curriculum areas and real-life settings. (1A5)
8. Apply concepts regarding the nature of cognition and metacognition in science to planning and teaching. (2A5)

### Strand Three: Instructional Strategies

9. 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)
10. Design ways to organize and present content so that it is meaningful to students (pedagogical content knowledge). (1A2)
11. 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)
12. Make choices of content and learning activities that reflect developmental appropriateness for diverse learners. (2D6)
13. Demonstrate effective integration of reading, writing, and mathematics into science instruction. (3B3 and 3C6)
14. Plan for accommodations, modification, and/or adaptations to the general curriculum to meet the needs of individual learners in science. (1B2)

### Strand Four: Assessment

15. Discuss the purposes, strengths and limitations of formative and summative assessment. (2E1)
16. Explain the relationship between assessment and learning and show how to integrate assessment into various stages of the learning process. (2E2)
17. Demonstrate the beginning of the ability to adjust instruction based on formative assessment. (2B8)
18. Demonstrate knowledge of measurement related issues including validity, reliability, bias, norms, and Alabama testing procedures. (2E3 and 2E4)
19. Create assessment rubrics in science and be prepared to teach students how to use them. (2E6)
20. Engage students in self and peer assessment in science. (2E7)

**Course Content Outline and Readings:** (Readings listed for a particular week/class are to be read prior to the class indicated).

**Week 1 class/ Jan. 11-** *Ice breaker, introduction to course, syllabus, pre-assessment.*

**Week 1 lab/ Jan. 13-** *Safety in the science laboratory workshop; information on lab portion of course.*

**Week 2 class/ Jan. 18-** **M. L. King Jr. Holliday, no class.**

**Week 2 lab/ Jan. 20-** **First day** out in field placements unless you are notified otherwise.

**Week 3 class/ Jan. 25-** *Strand one topics, learning outcomes, lesson plans, and promoting positive behavior in the classroom.*

Reading: Selected portions of Harry Wong's *First Day of School*. I will provide you with a handout.

***Science Safety Plan Due.***

**Week 3 lab/ Jan. 25-** Scheduled field time

**Week 4 class/ Feb. 1-** *Strand two topics, nature of learning in science and prior knowledge, constructivist theory of learning*

Reading: Petty, Chapters 2 and 3

**Week 4 lab/ Feb. 3-** Scheduled field time.

**Week 5 class/ Feb. 8-** *Strand two topics cont., class openings, methods for assessing prior knowledge, setting purpose and using real life connections*

Reading: Petty, Chapter 16

**Week 5 lab/ Feb. 10-** Scheduled field time.

**Week 6 class/ Feb. 15-** *Strand three topics, presenting new information and using graphic organizers*

Reading: Petty, Chapters 10 and 17

***"Practice" lesson plan due.***

**Week 6 lab/ Feb. 17-** Scheduled field time.

**Week 7 class/ Feb. 22-** *Strand three topics, effective whole class interactive discussion and questioning techniques*

Reading: Petty, Chapter 9

**Week 7 lab/ Feb. 24-** Scheduled field time.

**Week 8 class/ March 1-** *Strand three topics, cooperative and collaborative learning*

Reading: Petty, Chapters 12 and 13

Week 8 lab/ March 3- Scheduled field time.

**Week 9 class/ March 8-** *Strand three topics, using labs and inquiry-based science*

Reading: Petty, Chapter 18

***Science Safety Plan due.***

**Week 9 lab/ March 10-** Scheduled field time.

**Week 10 class and lab, March 15-19 Spring Break, no classes. ☺**

**Week 11 class/ March 22-** *Strand three topics, using reading and writing in science. Note: Dr. Wallace will be at a conference. Class will be conducted over Blackboard.*

Reading: Two articles from a recent issue of The Science Teacher, “Building Background Knowledge” by Fisher et al. (vol. 77, no. 1, pp. 23-26) and “More than Writing to Learn” by McDermott (vol. 77, no. 1, pp. 32-37). Available through AU library system.

**Week 11 lab/ March 24-** Scheduled field time.

**Week 12 class/ March 29-** *Strand three topics, planning for differentiation*

Reading: Short reading at <http://www.scienceforamerica.com/teacher-preparation/differentiation-in-science.html>

***Blackboard Discussion Blog due.***

**Week 12 lab/ March 31-** Scheduled field time.

**Week 13 class/April 5-** *Strand four topics, overview of assessment, data and measurement, rubrics*

Reading: None.

**Week 13 lab/April 7-** Scheduled field time.

**Week 14 class/ April 12-** *Strand four topics, feedback and formative assessment*

Reading: Petty, Chapter 8

**Week 14 lab/ April 14-** Scheduled field time.

**Week 15 class/ April 19-** *Strand four topics, more on formative assessment and metacognition*

Reading: “Science inside the black box” by Black and Harrison. I will provide you with a handout.

**Week 15 lab/ April 21-** Scheduled field time. **Last day** out at schools.

Reading: None.

**Week 16 class/ April 26-** Work on portfolios

***Class notes/exercises on assessment due.***

**Week 16 lab/ April 28-** Lab back on campus, debrief field experiences, “drag and brag” activity.

***Outreach documentation forms due.***

***Reflective journals due.***

**Week 17 class/ May 3-** Wrap up activities, TBA.

Reading: None.

***End-term portfolio due.***

**Final Exam: May 6, 12:00-2:30,** see questions below.

#### **Course Requirements/Assignments:**

- 1. Outreach experience (16 points, 8% of grade)-** 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). I will be able to give you a list of current opportunities. 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 28.**
- 2. Reflective journal (30 points, 15% of grade)-** 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. The following are sample questions which might guide you in writing your journal entries. Reflective journals will be graded on the criteria of effort, depth of reflection, evidence of problem solving and analysis. Reflective journals are **due on April 28.**

What is going really well with my (my partner’s, my mentor teacher’s) teaching? Why?

What are some challenges in the classroom today?

How might these challenges be addressed?

What am I learning about students?

What am I learning about science teaching?

What am I learning about myself and my own teaching style?

What will I want to incorporate or not incorporate in future teaching? Why?

3. **Rough drafts of teaching materials, artifacts, and documents (24 points, 12% of grade)**- Participation points will be rewarded for completing the following documents associated with teaching and learning and turning them in on time @ 3pts. each. Dr. Wallace will give formative feedback in the form of comments before you use these documents in end- term portfolio .
- **Lesson plans**- (to be coordinated with work ongoing in the field placement and discussed more in class)
    - a. “Practice lesson plan” foci- writing learning outcomes and eliciting prior knowledge, rough draft **due Feb. 15.**
    - b. First field lesson plan- should go with the class curriculum, keep in mind instructional strategies we are learning in class, due **Feb. 22 or March 1.**
    - c. Second field lesson plan- should go with the class curriculum, keep in mind instructional strategies we are learning in class, due **March 8 or March 22.**
    - d. Third field lesson plan- should go with the class curriculum, keep in mind instructional strategies we are learning in class, due **March 29 or April 5.**
    - e. Fourth field lesson plan- should go with the class curriculum, keep in mind instructional strategies we are learning in class, due **April 12 or April 19.**
  - **Science Safety Plan**- You will construct a science safety plan including: (a) lesson plan to actively teach safety; (b) safety rules and regulations; (c) safety quiz; (d) safety contract. Guidance and resources will be given in class. **Due Feb. 8**
  - **Blackboard Discussion Posting**- In the place of class on March 22, you will read and review two articles, one on reading and one on writing in science (see “Readings). Dr. Wallace will post questions on Blackboard regarding these readings and you are required to go on-line and post a response. **Due March 29.**
  - **Class Notes/ Exercises on Assessment**- We will discuss several aspects of assessment in class and make one or more practice rubrics. Just follow along the handout used on those days and write down your responses to the group and individual activities posed. **Due April 26.**
4. **Final Exam (30 pts., 15% of grade)**- There will be an essay final exam given on the designated final day for this class, May 6 from 12:00-2:30. 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. 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. **Due May 6.**
5. **Final Lab Field Placement Evaluation (20 pts., 10 % of grade)**- Total points accumulate on the final evaluation for the lab portion of the course will be numerically translated into 10% of the course grade. **Due April 28.**

6. **End-term portfolio (80 points, 40 % of grade)**- You will construct a portfolio that demonstrates that you have accomplished each of the course learning outcomes listed above. 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 on assessment
- Blackboard discussion posting
- Video segments of yourself teaching
- Another artifact of your choosing (please clear this ahead of time with the instructor)

You can use one journal entry to demonstrate anywhere from 1-3 learning outcomes. Thus, the minimum number of entries is 7 and the maximum number is 20. There is no correlation between your grade and the number of entries (unless you do not meet the minimum). The grade will be awarded on how the degree to which the entry demonstrates achievement of the learning outcome and the quality of the entry in terms of the learning outcome. Each **learning outcome** will be awarded a grade from:

- 4- Excellent, outstanding, exceeds expectations for a preservice teacher
- 3- Satisfactory, clearly meets expectations for a preservice teacher
- 2-Marginally satisfactory, shows some progress towards demonstrating achievement of the learning outcome, but will need additional attention during the internship
- 1-Unsatisfactory, does not demonstrate sufficient evidence of progress in the learning outcome
- 0- Not attempted

**Due May 3.**

**Evaluation and Grading Procedures:**

- A. The criteria for grading each assignment are included in the description of each assignment listed above.
- B. Points will be assigned according to how well the assignment meets the criteria.

- C. Points will be weighted according to the grading percentages shown above.
- D. Percentages will be applied and grades will be assigned as follows: **A** : 90+ points; **B** : 80 - 89 points; **C** : 70 - 79 points; **D**: 60 - 69 points; **F** : below 60 points. 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.

<u>Sample Grading Illustration</u>	<u>of 100%</u>	<u>of 200 pts.</u>
Outreach- Student completed all 4 hours	worth 8%	16 pts. of 16
Reflective journal- Student scored 22/30	worth 15%	22 pts. of 30
Rough drafts- Student turned 7/8 rough drafts on time	worth 12%	21 pts. of 24
Final Exam- Student scored 28/30	worth 15%	28 pts. of 30
Field Placement final evaluation; 75 (25 bullets on evaluation x 4) = 100/5)	worth 10%	15 pts. of 20
End-term portfolio; 68 (20 outcomes x 4) = 80	Worth 40%	68 pts. of 80
Total		170 of 200
Course percentage		85%
Course Grade	“B”	

### **Course and University Policies:**

Participation: Students are expected to participate in all class discussions, readings, and group work. 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 Tiger Cub. 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**. Please also see the attendance policy in the Secondary Science Lab Placement Handbook.

Unannounced quizzes: There will be no unannounced quizzes.

Accommodations: Students who need accommodations are asked to arrange a meeting during the first week of classes, or as soon as possible if accommodations are needed immediately. To set up this meeting, please contact me by e-mail. Bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have an Accommodation Memo but need accommodations, make an appointment with the Program for Students with Disabilities at 1244 Haley Center, 844-2096 (V/TT).

Honesty Code: The “University Academic Honesty Code” and the Tiger Cub “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
- Maintain a respectful attitude in class towards the instructor and other class members

Contingency Plan: If normal class and/or lab activities are disrupted due to a high number of students experiencing illness or an emergency or crisis situation (such as a widespread H1N1 flu outbreak), the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, an addendum to your syllabus and/or course assignments will replace the original materials.