EMPORIA STATE UNIVERSITY
DEPARTMENTS OF PHYSICAL SCIENCES

FALL 2010
COURSE SYLLABUS FOR

PS 516  TEACHING PHYSICAL SCIENCE IN MIDDLE / HIGH SCHOOLS

INSTRUCTOR:  Dr. Malonne I. Davies
OFFICE:  Science Hall 230B
PHONE:  620-341-5958
EMAIL:  mdavies@emporia.edu
OFFICE HOURS:
  M, W, R, F  11:00-11:50 AM
  M  2:00-2:50 PM
  Other times by appointment

CLASS MEETING:  Thursday, 6:30-9:20 PM, SH 177

COURSE DESCRIPTION (ESU Catalog):  (Pre requisite: at least 15 credit hours in the physical sciences. For pre-service teachers of Physical Sciences.) Introduction to the modes used to teach contemporary content in chemistry, earth / space science, physics, physical science or general science with emphasis on laboratory instruction and laboratory safety procedures. Teaching strategies, curricula, materials / resources to include instructional technology, evaluation, and characteristics of students as they relate to physical sciences teaching are major topic areas. Students do micro-teaches.

COURSE MATERIALS:
Required textbook:
Also required:
A Blue Book examination book, 8 ½ x 11, 12 leaves, 24 sides. [To be used as a reflective journal.]

Additional Reading and Supplementary Materials:  Some readings will be assigned from several other sources and some assignments assume the student will consult supplementary materials. These include (but are not limited to) middle and high school textbooks, publishers’ science curriculum series, science education journals, videos, CDs, DVDs and selected web sites. Many of these science education resources are available in the Science and Mathematics Education Center (SH 177) and/or William Allen White Library.

THE TEACHERS COLLEGE CONCEPTUAL FRAMEWORK:

Emporia State University’s faculty, including professional education and content area faculty, support a program designed to transform candidates into professionals. To help all students learn, the professional must have a command of content, critical ideas, and skills, and the capacity to reflect on, evaluate, and learn from their practice so that it continually improves. While there are different ways that successful professional educators can be highly effective, six proficiencies emerge from a shared evidence-based understanding of how to foster student learning. These six
proficiencies define the Professional: providing service to society; applying interdisciplinary scholarly knowledge; engaging in effective practice; responding to uncertainty and change; relying on self-reflection; and belonging to professional community.

Candidates study, learn, and grow in an academic setting that integrates and highlights the connections among general studies, content studies, professional studies, and clinical experiences. Moreover, the candidate preparing for a career in the field of education or an allied health field is immersed in an academic milieu that values a number of tenets the faculty see as essential for the professional development and growth of teachers, other school personnel, and those in the helping professions: the value of diversity, the relevance of authentic assessment, the essentials of professionalism, the importance of collaboration, the usefulness of technology, and the power of reflection. ESU’s professional education programs as well as the non-professional education programs offered within The Teachers College devote themselves to the proposition that candidates who learn and grow in such an atmosphere and who integrate knowledge, theory, and practice demonstrate the proficiencies of the Professional at the time of program completion.

This course addresses the Knowledge, Skills, and Dispositions outcomes indicated in red below. The coding is P# (proficiency) A (item under proficiency) # sub-item. If no sub-item number is shown, alignment is with all sub-items of that letter.

COURSE FRAMEWORK AND OBJECTIVES
The course is designed on a framework of six interrelated components (do not expect a linear coverage of topics). Each piece has several objectives or outcomes that students are expected to achieve. The framework and outcomes are shown on the next page.
PS 516 COURSE FRAMEWORK AND EXPECTED OUTCOMES

1. Self-knowledge with respect to being a science teacher
   The student will be able to articulate
   - personal motivation for becoming a science teacher
   - personal expectation of science teachers
   - public expectations of teachers and schools

   **P1A**
   basic teaching functions essential to successful science teaching

   **P1B, P1C**
   basic teaching functions essential to successful science teaching

2. Knowledge of middle and high school learners within the context of community
   The student will
   
   **P1A1**
   Describe characteristics of middle and high school ages learners

   **P1P1**
   Discuss the impact in the classroom (school) of demographics, diversity
   and societal norms

   **P1A3**
   Recognize the special needs of students

3. Science content and concept knowledge
   The student will
   
   **P2A3, P3A1**
   Describe historical and contemporary issues and trends affecting
   physical science teaching

   **P2A3**
   Demonstrate familiarity with recent science education reform documents,
   especially KSES

   **P3**
   Compare and contrast philosophies, goals and methods of various
   science teaching approaches
   - Demonstrate adequate content and concept knowledge in chosen physical
     science licensure areas

   **P5B, P5C**
   Illustrate knowledge of the curriculum development process and goals of
   long-term planning

4. Content pedagogy skills
   The student will be able to
   - Write learning objective/outcomes and indicators for a science lessons
   - Write formative and summative assessment items to match
     objectives/outcomes
   - Select varied and appropriate teaching strategies to achieve
     objectives/outcomes
   - Justify the selection of a given strategy for helping students meet a given
     objective/outcome
   - Prepare lesson plans for a science class – including
     [a] some that fit specific formats
     [b] sequences of several lessons in a unit (see SOME EXPECTED ASSIGNMENTS)

   The student will
   
   **P3, P5A1**
   Demonstrate skill with several science teaching strategies during
   mini-teaching sessions (in front of peers)
   - Critically evaluate physical science curricula and resources
   - Select appropriate resources for classroom use based on rational criteria
   - Develop adaptations of materials and/or methods for special needs
     students
   - Discuss suitable ways of dealing with controversial topics in the science
     classroom
   - Provide examples and discuss the used of assessment items representing
     multiple assessment formats and multi-faceted assessment programs.

   *Continues on next page*

5. Management of the learning environment
   The student will
Enumerate teachers’ responsibility and liability regarding safety in class, laboratory and on field trips

Critically discuss ways to safely organize and manage middle and/or high school science laboratory programs
Identify effective procedures / strategies for dealing with misconceptions, motivation and related management issues

6. Continuing Professional Growth
The student will
- Describe appropriate opportunities for profession growth in their current (pre-service) and future (in-service) situations
- Participate in professional growth opportunities as may be feasible during the course.

COURSE POLICIES AND PROCEDURES

Attendance: Students are expected to attend all class sessions. This class meets once each week for three hours. Missing one session is equivalent to missing a week of classes for the usual three sessions per week course. If you absolutely must miss a class session, it is your responsibility to contact the instructor (in advance whenever possible) concerning the absence and complete the appropriate make-up assignments. Excessive absences (more than one session) will result in a 10% reduction in your final grade for each 10% of class time missed. [Do the calculation: 15 sessions x ~3 hrs = 45 hours. 10% is 4.5 hrs or 1.5 class sessions.]

Time management: Recognize that for this course one class session is equivalent to a week of classes for the standard three-credit course (three sessions per week). This means that assignments made during a single class session will be more extensive than in a 50-minute class session. Consequently, you need to schedule study/preparation time for this class throughout the week, not just the “one-hour, night-before-class” that students often allocate for the customary three times per week class. In addition, several projects will be assigned on which you are expected to make progress throughout the semester.

Accommodations for disabilities: Emporia State University will make reasonable accommodations for persons with documented disabilities. Students need to contact the Director of Disability Services and the professor as early in the semester as possible to ensure that classroom and academic accommodations are implemented in a timely fashion. All communication between students, the Office of Disability Services, and the professor will be strictly confidential.

Academic Honesty: As the instructor, I expect each individual assignment and test to be the work solely of the student submitting it for grading. Materials or ideas gleaned from others and incorporated in a project / assignment should be properly credited to the source. Likewise, joint or group assignments are expected to be the work of all and only members of the group with proper credit given when appropriate. The ESU “Academic Dishonesty Policy” will be enforced in this class. Briefly, this means that academic dishonesty in this class will results in severe penalties. Possible penalties may include, but are not limited to, an assignment grade of F, a course grade of F, or dismissal from the university.
SOME EXPECTED ASSIGNMENTS

- Keep a reflective journal on specific questions / activities / events.
- Compile, organize and annotate a collection / bibliography of teaching resources.
- Complete a general (year-long) course plan including one detailed unit plan
- Prepare a sequence of daily lesson plans that fit within the detailed unit plan (~15 hours of instructional time)
- Submit critical reviews of various materials (specific items will be assigned)
- Demonstrate skill with various teaching strategies during mini-teaching sessions
- Lead one or more discussion on assigned topics

ASSESSMENT AND GRADES

A variety of assessment instruments will be used to evaluate the candidate’s performance. The course is intended to benefit you, the teacher education candidate. You will determine, to a large extent, by your diligence and effort, the value you receive from the course. Be aware that in addition to the assignments and projects, your attendance, attitude and effort will influence your final grade.

Grades on assignments: Many assignments such as daily work, activities, homework, and written assignments are intended to give you opportunities to achieve or demonstrate competence. In some cases, assignments may be returned for the purpose of making modifications until competence is demonstrated. Because you have opportunities to get help (second chances), higher normal standards will be used in evaluating some assignments.

<table>
<thead>
<tr>
<th>GRADE COMPONENT</th>
<th>% of GRADE</th>
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<tbody>
<tr>
<td>Mini-teaching activities</td>
<td>25</td>
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<tr>
<td>Demonstration (10%)</td>
<td></td>
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<tr>
<td>Mini-lesson teaching (10%)</td>
<td></td>
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<td>Leading discussion(s) (5%)</td>
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<tr>
<td>Critical reviews of resources</td>
<td>5</td>
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<tr>
<td>Planning – unit and ~15 hr set of detailed lesson plans</td>
<td>5</td>
</tr>
<tr>
<td>Collection of teaching resources with annotations</td>
<td>5</td>
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<tr>
<td>Reflective journal</td>
<td>5</td>
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<tr>
<td>Other assignments</td>
<td>20</td>
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<tr>
<td>Assessments</td>
<td>25</td>
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<tr>
<td>Mid-term (probably written) (10%)</td>
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<tr>
<td>Final mini-teaching activity (15%)</td>
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<tr>
<td>Attendance, participation, effort, attitude (aka dispositions)</td>
<td>10</td>
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Final grades will follow the ESU +/− system.