COURSE TITLE: Teaching Methods in Secondary School Science  
COURSE NUMBER: SCE 4330

COURSE DESCRIPTION (with prerequisites):
This course is designed for students who are majoring in science education and is offered concurrently with the practicum in teaching secondary science. It addresses the required instructional methods, techniques, strategies, resources, and assessment considerations for effective teaching of secondary science including the pedagogy of biology, genetics, ecology, botany, anatomy and physiology; using problem solving, cooperative learning and appropriate technology. This course addresses specific Sunshine State Standards, subject matter competencies and pedagogy pertinent to the discipline and required for certification. (3 semester hours credit)

10 hours of teaching are required. Co-requisite: SCE 4941

NAME(S) OF INSTRUCTORS:
Dr. Santine Cuccio

EFFECTIVE ACADEMIC YEAR:
2011-12

REQUIRED TEXTBOOKS AND INSTRUCTIONAL SUPPLIES:
   http://www.nap.edu/books/0309053269/html/R1.html [Standards]
3. *Florida Sunshine State Science Standards* [Available]  
   http://www.firn.edu/doe/curric/prek12/frame2.htm) [SSS]
4. Florida Educator Competencies and Skills  
   http://www.fldoe.org/asp/ftce/ftcecomp.asp#Fifteenth
5. Florida Educator Accomplished Practices

GRADING POLICY:
The standing of a student in each course is expressed by one of the following letters and corresponding grading system:
A – 90 – 100
B – 80 – 89
C – 70 – 79
D – 60 – 69
F – 59 or less
The Chipola Catalog provides policies and procedures regarding the grading system. A student’s Grade Point Average is derived from the grading system/quality point scale.

**ATTENDANCE AND WITHDRAWAL POLICIES:**
Chipola College expects regular attendance of all students. Students who are absent from classes for any reason other than official college activities must satisfy the instructor concerned that the absence was due to illness or other clearly unavoidable reasons. Otherwise, the student may suffer grade loss at the discretion of the instructor. Chipola policy allows each instructor to specify in the Instructor First Day Handout whether or not an absence is excusable and what affect the absence or tardy may have on the grade.

A student is allowed to repeat a course a maximum of three (3) times. **On the third attempt a student** (1) must bear the full cost of instruction (unless waived by Student Services), (2) cannot withdraw, and (3) must receive a grade.

**MAKE-UP POLICY:**
Chipola allows each instructor to specify in the Instructor First Day Handout the makeup policy.

**ACADEMIC HONOR CODE POLICY:**
Students are expected to uphold the Academic Honor Code. Chipola College’s Honor Code is based on the premise that each student has the responsibility to (1) uphold the highest standards of academic honesty in his/her own work; (2) refuse to tolerate academic dishonesty in the college community; and (3) foster a high sense of honor and social responsibility on the part of students. Further information regarding the Academic Honor Code may be found in the Chipola Catalog, Student Governance section.

**STUDENTS WITH DISABILITIES POLICY:**
Chipola College is committed to making all programs and facilities accessible to anyone with a disability. Chipola’s goal is for students to obtain maximum benefit from their educational experience and to effectively transition into the college environment. Students with disabilities are requested to voluntarily contact the Office of Students with Disabilities to complete the intake process and determine their eligibility for reasonable accommodations.

**LIBRARY AND ON-LINE REFERENCE MATERIALS:**
The library is a comprehensive learning resource center providing information in print, electronic, and multimedia format to support the educational objectives of the College. On-line catalogs, e-books and electronic databases can be accessed by using the LINCCWeb icon on the Chipola Library website at [www.chipola.edu/library](http://www.chipola.edu/library). If you have questions about database usage consult the “How to Use the Chipola Databases” on the Library website or call the Library at 850/718-2274 during regular hours. Library hours are posted each semester at the building entrance and on the Library website. See your Instructor First Day Handout for individual instructor recommendations and resources.
TECHNOLOGY RESOURCES:
The Information Technology Center, located in the library, is equipped with computer workstations. Lab hours are posted each semester at the building entrance and on the Library website. The ACE Lab, located in Building L, is available for tutoring and is equipped with computer workstations. Lab hours are posted each semester at the room entrance. The college’s learning management system is Desire 2 Learn (d2l). Classes become available on d2l on the first day of the semester. It is the student’s responsibility to log onto the d2l system the first day of class to establish the first day of attendance and to check announcements. For further information, contact your instructor or the Director of Online Learning.

ELECTRONIC DEVICE USAGE:
All electronic devices such as cell phones, beepers, pagers, and related devices are to be silenced prior to entering classrooms and/or laboratories to avoid disruption. Should it become necessary for a student to leave his/her “device” on to send or receive an emergency call and/or text message, the student must inform the instructor prior to class. If the student finds it necessary to send and/or receive an emergency call and/or text message during class/lab time, he/she is instructed to take all books and belongings and step outside the classroom to deal with the situation. To minimize classroom disruption and the distraction to classmates, the student will not be permitted to reenter the classroom during that class period. Any time a test is being administered, all such devices must be turned off and put away. If a device is seen or heard during an exam, a score of zero will be given for that exam. Initial and repeated infractions may result in disciplinary action.

DISCIPLINE SPECIFIC COMPETENCIES / LEARNING OUTCOMES:

E – 1 Demonstrate understanding of instructional design and lesson planning by applying concepts from human development and learning theories.

E – 2 Demonstrate the ability to maintain a student-centered learning environment that is safe, organized, equitable, flexible, inclusive and collaborative.

E – 3 Demonstrate effective instructional delivery and facilitation by utilizing deep and comprehensive knowledge.

E – 4 Demonstrate understanding of assessment by analyzing and applying data from multiple assessments to diagnose learning needs and inform instruction.

E – 5 Demonstrate continuous improvement by designing purposeful goals to strengthen instructional effectiveness and impact student learning.

E – 6 Demonstrates professional responsibility and ethical conduct and fulfills expected obligations to students, the public, and the education profession.

1. Task CC3B (FEAP 5.4, 5.5): Each student must show evidence of professional growth during this course. This evidence may be acquired by (1) attending a science seminar, like FAST Conference in Orlando Florida, or (2) reading articles from a professional journal in science education. Each student will submit a
minimum of six presentation or article summaries, handouts or worksheets included, and a reflection. The reflection should include your opinion regarding (1) the feasibility of implementation (if appropriate), (2) its effectiveness, (3) whether you plan to use it in the future, and (4) any modifications you might want to make.

2. **Task 2.2.1 (2.1, 2.2, 2.3, 2.5, 3.1, 3.3, 3.4, 3.6, 3.7, 3.9, 3.10, 5.1)** - The teacher candidate has three 15-30-minute lessons videotaped or observed by an instructor, evaluates his/her performance, and obtains an external evaluation from a peer or the mentor on each lesson. The product is the set of three self-assessments (one of which must be typed), three peer/mentor assessments and the teacher candidate’s summary of what he/she has learned.

3. **Task 5.4.2 (2.3, 2.4, 2.5, 2.6, 2.8, 3.8)** - The teacher plans a lesson for a class containing diverse students. The teacher is observed to determine effectiveness of instruction with a diverse student population. This observation targets sensitivity, equitable treatment, and planning for students from different backgrounds, cultures, and skill levels.

4. **Task CC10A (FEAP 1.6, 5.4):** The file of ten lesson plans appropriate for secondary classrooms that come from journals, websites, publishers, etc. that supplement textbook based instruction.

5. **Task CC8B SS (FEAP 5.4):** The candidate completes a series of written tests that require specific content knowledge as articulated in the *Florida Science Content Standards and the Competencies and Skills for Biology*. If the student has passed the subject area exam for his/her major, then this task has been completed. For this exemption, a copy of a passing score must be recorded in the database by end of the first week of classes.

### LINKING COURSE-LEVEL STUDENT LEARNING OUTCOMES WITH DISCIPLINE-SPECIFIC COMPETENCIES, ASSESSMENT METHODS, AND ARTIFACTS

<table>
<thead>
<tr>
<th>STUDENT LEARNING OUTCOMES FOR SCE 4330</th>
<th>NGSSS/ NSES Standards</th>
<th>FEAPs (Discipline Outcomes)</th>
<th>FL Competencies and Skills:</th>
<th>Assessment Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will:</td>
<td></td>
<td></td>
<td>Science 6-12</td>
<td>Professional Ed.</td>
</tr>
<tr>
<td>Understand and explain the history and use of NSES Science Teaching, Assessment, Professional Development and Content Standards (emphasizing their unifying concepts, processes, inquiry and their overall purpose of science literacy); and NGSSS.</td>
<td>All</td>
<td>All NSES Science Teaching Standards</td>
<td>11, 12, 13</td>
<td>13.1, 13.2</td>
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<tr>
<td>Know how to plan for instruction at the high school, relating the essential components of the lesson plan design (from introduction to E-1</td>
<td>9.1, 9.2, 9.3, 9.4</td>
<td>Test</td>
<td></td>
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<tr>
<td>Plan inquiry based science lessons for students, which include objectives adapted to: national and state goals; experiences, interests, questions and ides of students.</td>
<td>NSES Teaching Standards</td>
<td>E-1 1.1-3, 1.6 E-2 2.3, 2.4, 2.8-9</td>
<td>1.1-16</td>
<td>4.1-2, 10.1-3</td>
</tr>
<tr>
<td>Ascertain prior knowledge (naïve concepts) in science for given grade levels as well as culture and experiential background of students, and their effects on learning.</td>
<td>NSES Teaching Standards</td>
<td>E-1 1.2 E-3 3.3-5</td>
<td></td>
<td>5.1,5.2,7.3</td>
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<tr>
<td>Describe cognitive, affective, psychomotor approaches and strategies for how diverse high school students learn meaningfully (for example, concept mapping, integrated process skills)</td>
<td>All NSES Science Teaching Standards; All NSES Science content Standards</td>
<td></td>
<td>7.1-5; 14.2</td>
<td>Test</td>
</tr>
<tr>
<td>Build a repertoire of teaching strategies (to be used in each part of the lesson plan) which promote NSES inquiry and discovery based science experiences: laboratory/demonstrations (with safety precautions); questions and discussion; technology; cooperative learning; and those that promote critical, creative thinking and problem solving.</td>
<td>All NSES Science teaching Standards</td>
<td>E-1, E-2, E-3, E-6, 2.1, 2.2, 2.3, 2.5, 3.1, 3.3, 3.4, 3.6, 3.7, 3.9, 3.10, 6</td>
<td>14.2</td>
<td>2.4, 4.1, 4.2, 7.1, 7.2, 7.3, 7.4, 7.5, 14.2</td>
</tr>
<tr>
<td>Plans for and implements the central strategy for teaching science which is “inquiry into authentic questions generated from student experiences”</td>
<td>NSES Teaching standards; selected NSES/NGSSS content</td>
<td>E-1 1-6 E-2 2.1-8 E-3 3.1, 3.3-7, 3.9-10</td>
<td>1.1-16</td>
<td></td>
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<tr>
<td>Review science content contained in the Florida Competencies and Skills and NGSSS</td>
<td>All NSES All NGSSS</td>
<td></td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>Plan, critique (with colleagues) appropriate (grade, diverse learners) science lessons in one of the NGSSS content areas (or interdisciplinary): physical science, life science or earth and space science</td>
<td>Selected benchmarks dependent on student lesson topic</td>
<td>E-1 Selected competencies 1-10, based upon lesson topic selected</td>
<td>5.1, 5.2, 10.1, 10.2, 10.3, 14.3</td>
<td>Teaching assignments and accompanying lesson plans-SD</td>
</tr>
</tbody>
</table>
Measuring Student Learning Outcomes:

1. Attend and participate in class regularly.
2. Read all assigned material before class.
3. Study in-class notes and on-line (d2l) materials.
4. Complete assigned projects in a timely manner to enable reflections and revisions on the final product.
5. Seek opportunities to practice teaching skills through tutoring and substituting in K – 12 schools.

Assignment and/or Course Outline

See your Instructor First Day Handout for individual instructor assignment schedule.