

Department of Teaching & Learning

**Course Title:** Principles and Methods:K-9 School Science

**Course Number:** SCE 4350

**Credit Hours:** 3 semester hours

**Prerequisites:**  SCE 4113, LAE 4353, TSL 4080

**Course Logistics:**

* **Terms:** fall, spring, summer
* **Hybrid/Hyflex:** online/in-class/mixed mode
* **Class location and time:** Davie, Boca, Jupiter(time not available)

**Instructor:** To be determined

**Office Address/Office Hours:** To be determined

**Phone Number/Email:** To be determined

**TA contact information:** Not applicable

**Catalog Description:**

A review of concepts in science and a study of methods/materials related to K-9 science teaching.

**Course Connection to the College of Education (COE) Conceptual Framework:**

As reflective decision-makers students will make informed decisions, exhibit ethical behavior, and provide evidence of being capable professionals by demonstrating abilities to conduct science inquiry and teach science through an inquiry-based approach and developing lessons plans and integrated units that show respect for the developmental characteristics of children and needs of diverse student populations.

**Required Text/Reading *(text may vary according to instructor)*:**

Settlage, J. & Southerland, S. (2012). Teaching Science to Every Child: Using Culture as a

Starting Point. New York, NY: Routledge.

**Required Standards:**

Board on Science Education (2011). A Framework for K-12 Science Education. Washington, DC:

 National Academies Press at: [http://www.nap.edu/catalog.php?record\_id=13165#](http://www.nap.edu/catalog.php?record_id=13165)

NGSS Lead States, 2013. Next Generation Science Standards: For States, by States, Washington DC: National Academies Press at: <http://www.nextgenscience.org/next-generation-science-standards>

 Appendix A: Conceptual Shifts in the Next Generation Science Standards

 Appendix C: College and Career Readiness

 Appendix D: “All Standards, All Students”: Making the Next Generation Science Standards Accessible to All Students

 Appendix F: Science and Engineering Practices in the Next Generation Science Standards

 Appendix G: Crosscutting Concepts in the Next Generation Science Standards

 Appendix H: Understanding the Scientific Enterprise: The Nature of Science in the Next Generation Science Standards

**Special Course Requirements:**

Students in this course are required to have an active ***LiveText*** account to track mastery of programs skills, competencies and critical assignments, and to meet program and college accreditation requirements. To receive a passing grade in this course, you must have a *LiveText* account within the first four (4) weeks of the fall or spring semester, within the first three (3) weeks of summer session, or after the first class of a fast track course. Students who do not have an active *LiveText* account may have an academic hold placed on their records. For information regarding account activation, please go to the COE website at: <http://coe.fau.edu/livetext>. For information pertaining to financial assistance, please go to: <http://www.coe.fau.edu/livetext/livetextfinincialassistane.htm>

**Supplementary/Recommended Reading:**

Konicek-Moran, R. & Keeley, P. (2015). *Teaching for conceptual understanding in Science.* Arlington, VA: NSTA Press.

*ScienceSaurus: A Student Handbook.* (Grades 6-8) at: [www.greatsource.com](http://www.greatsource.com) ***or***

Spangler, S. (2010). *Naked Eggs and Flying Potatoes.* Greenleaf Book Group Press: Austin, TX.

Spangler, S. (2012). *Fire Bubbles and Exploding Toothpaste.* Greenleaf Book Group: Austin, TX.

**Recommended Membership (Professional Development):**

National Science Teachers Association (NSTA, special student rate) at: <http://www.nsta.org/>

**Standards and Guidelines Used for Developing Course Objectives:**

American Association for the Advancement of Science (AAAS) Benchmarks for Science Literacy

 [%2Eedu%2Ftaylorar%2F&txtURIOld=%2Ftools%2Fbenchol%2Fbolframe%2Ehtm](http://www.project2061.org/publications/bsl/online/index.php?txtRef=http%3A%2F%2Fpeople%2Euncw%2Eedu%2Ftaylorar%2F&txtURIOld=%2Ftools%2Fbenchol%2Fbolframe%2Ehtm)

Association for Childhood Education International Elementary Education Guidelines (ACEI)

 <https://www.acei.org/childhood-education>

Florida Educator Accomplished Practices (EAP)

 <http://www.fldoe.org/teaching/professional-dev/the-fl-educator-accomplished-practices.stml>

Florida Subject Area Competencies-Elementary Education K-6 (FSMCS: ELE)

Science and Tech Standards <http://learningcenter.nsta.org/state.aspx?action=start&state=FL>

Access Points (FSAC) <http://www.floridastandards.org/Standards/AccesspointSearch.aspx>

Florida Subject Area Competencies (ESOL)

 <http://www.fldoe.org/core/fileparse.php/7719/urlt/0071749-mnellf.pdf>

Framework for K-12 Science Education

 Next Generation Science Standards (NGSS) <http://www.nextgenscience.org/>

**Course Objectives/Student Learning Outcomes:**

1. Analyze and discuss the advantages and limitations of modern approaches to teaching science in the elementary and middle school settings.
* ACEI: 1.0, 2.2
* EAP: 5.1, 7.1, 7.2, 9.1
1. Demonstrate knowledge and understanding of various hands-on discovery approaches to science teaching/learning, especially guided-discovery teaching/learning.
* ACEI: 3.1, 3.3, 3.4
* EAP: 1.1, 4.1, 4.2, 9.1 10.1, 10.2
* ESOL: 5.4
1. Identify skills and strategies important for the development and assessment of thinking skills, problem solving skills, and effective questioning techniques.
* ACEI: 4.0
* EAP: 1.1, 4.1, 4.2, 5.1, 7.1, 7.2, 9.1
* ESOL: 16.2
1. Develop skills necessary for effective lesson planning including incorporation of hands-on science instruction, and locating and preparing necessary resources and materials.
* ACEI: 3.1, 3.3, 3.4, 5.1, 5.2
* EAP: 1.1, 4.1, 4.2, 5.1, 6.1, 6.2, 7.1,7.2, 8.1, 8.2, 9.1, 10.1, 10.2, 12.1, 12.2
* ESOL: 8.4, 8.5,11.5, 16.2, 20
1. Demonstrate proficiency in knowledge and understanding of basic science concepts, scientific principles, the nature of science, and goals and objectives of science education in accordance with national and state science education standards.
* ACEI: 2.2
* EAP: 4.1, 4.2, 8.1, 8.2, 9.1, 10.1
* FSMCS: ELE: 18.1, 18.2, 18.3, 19.1, 19.3, 19.4, 19.5, 19.6, 19.8, 19.9, 19.10, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, 21.1, 21.2, 21.3, 21.4, 22.1, 22.3, 22.4, 22.5, 22.6, 23.1, 23.2, 23.3, 23.4, 24.1, 24.2, 24.3, 24.5, 25.1, 25.2
1. Describe ways of incorporating various forms of technology into science instruction and lesson planning.
* ACEI: 2.2
* EAP: 12.1, 12.2
* ESOL: 17.5
* FSAC: 26.1, 26.2, 26.4
1. Describe ways of assessing what students know and are able to do.
* ACEI: 4.0
* EAP: 1.1, 8.1, 9.1
* ESOL: 17.5
1. Describe ways of integrating science with math, arts, social studies, music, and language arts.
* ACEI: 2.8
* EAP: 4.1, 4.2, 7.1, 8.1, 10.1, 10.2
* ESOL: 8.4, 8.5, 11.3, 11.4, 11.5
1. Demonstrate an understanding of the importance of teaching science to students with disabilities, including students of all social and cultural backgrounds.
* ACEI: 3.3, 3,4
* EAP: 5.1
* ESOL: 6.5, 6.6, 6.10
1. Demonstrate ability to work effectively with limited English proficiency and exceptional student education students.
* ACEI: 3.3, 3.4
* EAP: 5.1
* ESOL: 17.5

***Please read and answer the questions for assigned chapters by the class date shown on the Content Topical Outline below. All chapters are in the Settlage text. IMPORTANT - Please check the announcements and e-mails in Blackboard on a regular basis. All materials that should be printed for the week’s classes will be posted by 9:00pm.on the night before each class.***

**Content Topical Outline: *Socioscientific issue & related topics will vary according to instructor.\****

|  |  |
| --- | --- |
| **Weeks** | **Topics** |
| **#1** | Course discussion and introductions:* The Story of Sputnik Documentary at: <https://www.youtube.com/watch?v=GhJnt3xW2Fc>
* ***Class Assignment:*** What was Sputnik and how did it influence science education in the U.S.?
 |
| **#2** | Great Water Odyssey Program: ***(activity will vary according to instructor)\**** * ***Bring:*** Your laptop and earbuds. Have wi-fi set up and Adobe Flash Player installed.
* ***Assignment due:*** *Great Water Odyssey 5-E Lesson.*
 |
| **#3** | Discuss: * Website Resources Review.
* Forward, Preface, and Chapter 1 - Forming Commitments to Science Teaching*.*
* Introduction to the Next Generation Science Standards (NGSS).
* ***Assignments due:*** Review 10 Favorite Websites. Read NGSS Appendix A: Conceptual Shifts in the Next Generation Science Standards and Appendix C: College and Career Readiness. Read the Forward and Chap 1. Answer the questions - Chapter 1.
 |
| **#4** | Discuss: Classification * Classifying Lessons.
* Chapter 3 - Basic Science Process Skills: Observe, Infer & Classify.
* Chapter 4 - More Basic Science Skills: Measure, Predict & Communicate.
* ***Assignment due:*** Read and answer the questions - Chapters 3 & 4.
 |
| **#5** | Basic Science Process Skills:* Chapter 5 - Experimenting as a Valuable Way of Doing Science (in-class experiments).
* ***Assignments due:*** Complete Science Content and Attitudes Survey online ***(assignment will vary according to instructor)***.\* Read and answer the questions - Chapter 5. Read NGSS Appendix F: Science and Engineering Practices in the Next Generation Science Standards and Appendix D: “All Standards. All Students”: Making the Next Generation Science Standards Accessible to All Students.
 |
| **#6** | ***In-Class Experiments (complete)***  |
| **#7** | Presentations: Science Experiments * Nature of Science and introduction to socioscientific issue - film ***(film will vary according to instructor)***.\*
* ***Assignments due:*** Read and answer the questions - Chapter 2. Read NGSS Appendix H: Understanding the Scientific Enterprise: The Nature of Science in the Next Generation Science Standards.
 |
| **#8** | Discuss: * Chapter 6 - Using Theory to Explain and Understand Science Learning.
* Chapter 8 - Varying Approaches to Science Instruction (***discussion topic will vary)***.\*
* Chapter 9 - The 5-E Learning Cycle as a Model for Science Teaching ***(lesson plan topic will vary)***.\*
* ***Assignments due:*** Written Science Experiment.Read and answer questions - Chapters 6, 8 & 9.
 |
| **#9** | Discuss: * Chapter 11 - From Activity to Inquiry.
* Chapter 10 - Questioning Strategies and Leading Discussions.
* Chapter 7- Assessing Students Science Learning.
* ***Assignments due:*** Read and answer questions - Chapters 11, 10 & 7. Read NCSS Appendix G: Questions and Argumentation Article.
 |
| **#10** | Discuss: * Chapter 12 - Integrating Science with Other Subjects.
* Science Argumentation - *Chasing Ice*
* ***Assignment due:***  Read and answerquestions -Chapter 12. Questions and Argumentation Article.
 |
| **#11** | Earth and Space Science NGSS: Presentation and Lesson Plans ***Assignment due:*** Read Frameworks Chapter 7: Disciplinary Core Ideas - Earth and Space Sciences (pp.169-199). |
| **#12** | Life Science Lesson Plans NGSS: Presentation and Lesson Plans***Assignment due:*** Read Frameworks Chapter 5: Disciplinary Core Ideas - Life Sciences (pp. 103-138).  |
| **#13** | Physical Science NGSS: Presentation and Lesson Plans ***Assignment due:*** Read Frameworks Chapter 6: Disciplinary Core Ideas - Life Sciences (pp.139-168).***Project due:*** Moon Projects due on or before this class.  |
| **#14** | ***Written and Oral Argument Presentations***  |
| **#15** | ***Visit the Science Museum or Gumbo Limbo Nature Center*** ***Assignment due:*** Reflections on Informal Science Learning Experience |
| **#16** | ***Feedback on Lessons. Examination on Readings, Pedagogy, and Experimental Design.******Assignments due: Unit Study and Notebooks.***  |

**Teaching Methodologies:**

Modeling of inquiry-based teaching, scientific research and experimental design, lecture, guided reading questions, discussion, technology (Blackboard for course and international science fair mentoring project) websites, portals, and interactive web-sites, DVD’s, Inspiration (concept mapping, PowerPoint presentations), cooperative learning presentations, guest presentations, and field trips.

##### Next Generation Science Discipline Presentation and Lesson Plan Competency Assessment

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Competency Assessment for FEAPs A.1b and A.3.d & f** | **Pt. Value** | **E\*** | **M\*\*** | **D\*\*\*** |
| **Group Overview** |  |  |  |  |
| ***Written Lesson Plan Components*** |  |  |  |  |
| ***Introductory Information*** |  |  |  |  |
| **Grade Levels** | **1** |  |  |  |
|  Guiding Questions | **2** |  |  |  |
|  Learning Objectives | **2** |  |  |  |
|  Correlation to Standards | **5** |  |  |  |
|  Teacher Background (Individual Component) | **12** |  |  |  |
| **II. Instructional Component 5 - E Learning Cycle Model Lesson**  |  |  |  |  |
|  Materials | **1** |  |  |  |
|  Timeline | **5** |  |  |  |
|  Engage – connects the lesson to prior lessons. | **10** |  |  |  |
|  Exploration | **25** |  |  |  |
|  Explanation (Including a PowerPoint presentation) | **20** |  |  |  |
|  Elaboration | **4** |  |  |  |
| ***Evaluation (Individual Component)***(Formative - 2 to 3 questions per phase and Summative - at least 2 multiple-choice and two constructed response items at higher-order question levels, Assessment/Scoring Rubric) | **12** |  |  |  |
| **III. Supplemental Components** |  |  |  |  |
|  Crosscutting Concepts | **3** |  |  |  |
|  Science and Engineering Practices | **3** |  |  |  |
|  Strategies for Diverse Learners | **3** |  |  |  |
|  Classroom Management and Safety Issues | **2** |  |  |  |
|  Recommended Websites | **2** |  |  |  |
| ***Writing Style***Written for teacher audience (or use italicsfor teacher information), Grammar, Organization (Headings), and References. | **5** |  |  |  |
| ***Presentation of Lesson Plan*** | **5** |  |  |  |
| **Posting of Lesson Plan and PowerPoint to Blackboard Discussion and Live Text** | **3** |  |  |  |
| **Total Points**  | **125** |  |  |  |

**Scoring Rubric:** Demonstrates ability to plan activities to be included in a lesson plan with identified performance and learning outcomes.

**E = Exceeds Expectations (> 112) \***

**M = Meets Expectations (100 – 111) \*\***

**D = Does not meet Expectations (< 100) \*\*\***

***FEAPs Lesson Plan Assignment***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FEAPs** | **E\*** | **M\*\*** | **D\*\*\*** | **Assignment** |
| ***A Quality of Instruction*** |  |
| **A.1** **Instructional Design and Lesson Planning** | **Applying concepts from human development and learning theories, the effective educator consistently:** |
| A.1 b. Sequences lessons and concepts to ensure coherence and required prior knowledge. | Develops a science lesson that clearly and articulately sequences science concepts to ensure coherence, and assesses the science concepts. | Develops a science lesson that sequences science concepts to ensure coherence, and assesses the science concepts. | Fails to develop a science lesson that sequences science concepts to ensure coherence, and assesses the science concepts. | Science Lesson Plan |
| **A.2 The Learning Environment** | **To maintain a student-centered learning environment that is safe, organized, equitable, flexible, inclusive, and collaborative, the effective educator consistently:** |
| A.2.e Models clear, acceptable oral and written communication skills. | Demonstrates exceptional subject matter knowledge in the written portion and the presentation of a science research project. | Demonstrates subject matter knowledge in the written portion and the presentation of a science research project. | Fails to demonstrate subject matter knowledge in the written portion and the presentation of a science research project. | Science Research Project |
| **A.3 Instructional Delivery and Facilitation** | **To utilize a deep and comprehensive knowledge of the subject taught, the effective educator consistently:**  |
| A.3. d. Modifies instruction to respond to preconceptions or misconceptions. | Within the science lesson plan, identifies 3 or more modifications to respond to scientific preconceptions or misconceptions. | Within the science lesson plan, identifies 2 modifications to respond to scientific preconceptions or misconceptions. | Within the science plan, identifies 0-1 modifications to respond to scientific preconceptions or misconceptions | Science Lesson Plan |
| A.3. f. Employs higher-order questioning techniques. | Within the science lesson plan, employs 3 or more higher-order questioning techniques. | Within the science lesson plan, employs 2 higher-order questioning techniques. | Within the science lesson plan, employs 0-1 higher-order questioning techniques. | Science Lesson Plan |

**E = Exceeds Expectations (> 112) \***

**M = Meets Expectations (100 – 111) \*\***

**D = Does not meet Expectations (< 100) \*\*\***

**Course Assignment and Project Requirements:**

1. **Five-E Water Odyssey Lesson (Individual) *(activity will vary according to instructor).*\***
2. Using the Great Water Odyssey Program, develop a simple 5-E (Engage, Explore, Explain Elaborate, and Evaluate) inquiry-based plan during class.
3. **Review of 10 Favorite Internet Resources (Individual):** Skim through the websites in the PowerPoint. Review the Steve Spangler website, NSTA website, and choose eight others to look at in more depth and discuss what you liked about these particular sites and how you would use them in your teaching. These sites will help you throughout the course.
4. **Controlled Science Investigation (demonstration of subject matter knowledge on science experimental design processes**): In teams of three, design and conduct a science experiment. The experiment should relate to and help teach a science concept (example: an experiment to determine whether land or water heats faster will teach students about heat capacity). More guidelines will be provided during the first few weeks of class. This assignment will help you prepare for teaching elementary students how to design and conduct science experiments for typical science fairs. The assignment will also help you learn how to adapt activities into controlled investigations. See more details in the folder on Blackboard.
5. **Moon Observation Project (Individual):** Observe the moon for at least 10 consecutive nights beginning a day or two after the New Moon Phase (dates to be announced in class). Turn in by (deadline to be announced in class) or when complete. Record the moon’s position in the sky, its phase, and weather conditions in a journal. Make **one** drawing of the horizon showing the moon’s relative position and phase each night. You will have one drawing with several moon phases on it as it changes and moves from night to night. Answer the questions provided. See more details in the folder and handout posted on Blackboard.
6. **Next Generations Science Standards (NGSS) Discipline Presentation and Lesson Plan (Group/Individual Lesson Plan):** Provide an overview of the assigned NGSS discipline and teach a sample lesson. Choose an earth and space, physical, or life science topic in the *Next Generation Science Standards* that relates to weather and climate. Develop a lesson 5-E inquiry-based lesson plan and teach it to the class. You may also choose a topic on engineering, technology, and/or applications of science. More guidance on construction of the lesson plan will be provided as we discuss chapters in the textbook. You will need to include guiding questions, learning objectives, correlation to standards, misconceptions, a PowerPoint presentation on the science content, a learning activity, assessment, trade books, websites/technology, considerations for diverse learners, and careers related to the topic. ***You are required to upload your group’s final written lesson into LiveText as your competency assessment for the course.***
7. **Written and Oral Scientific Argument *(argument topic will vary according to instructor).\**** Choose one of the following questions a climate/weather skeptic might ask:
* Are extreme weather events (such as precipitation, flooding, drought, and heat waves) happening more frequently and are they likely due to climate change?
* Is Earth’s temperature increasing and is the recent trend unusual compared to trends in the past? Are humans and/or natural factors primarily responsible for recent changes in the climate?
* How do climate scientists know humans are driving climate change and how certain are they?
* Is there evidence that Earth has already warmed (other than atmospheric temperature)?
* What are the physical impacts to Earth projected over the next few decades through 2100?
* Are the impacts of a few degrees of warming harmful to societies and ecosystems on Earth?
* Can humans reduce the risks and costs of climate change?

*You will play the role of a scientist (or a “debunker”). First, you will investigate the skeptic’s argument and present a brief review of their claim, evidence, and justification. Then, you will develop a scientific counter-argument (claim, evidence, and justification) and a rebuttal to refute the skeptics’ argument.*

* **Your argument will include the following components:**
* ***Skeptics’******Argument* -**Skeptics’ claim, the evidence, and justification.
* ***Scientists’******Counter-Argu*ment -**Scientists’ claim, evidence, and justification.
* ***Rebuttal to Skeptics’ Argument* -**Explanation of why the skeptics’ argument is NOT correct and a few examples of how to respond to more specific sub-arguments.
* **Use the Weather/Climate Argument Template and**[**Scoring Rubric**](http://www.ces.fau.edu/nasa/content/teacher-materials/scoring-rubric-for-arguments.docx) **to help you develop your written and oral argument *(topic will vary according to instructor).\****
* ***Individual Written Argument (Script)* -** Explain each component of your argument. Include a heading for each of the components. This script should closely match your PowerPoint presentation slides, including graphs, tables, and images. Turn in the day of the argument presentations **(60 points = 6%).**
* ***Team’s Oral Argument (Presentation in form of a PowerPoint)* -** Present your team’s argument in the form of a PowerPoint. Please upload your team’s PowerPoint in the *Discussion Site* in Blackboard, and turn in a print copy of your PowerPoint on the day of the presentations.Your Power Point should be a few slides (~10-12 maximum) **(40 points = 4%).**
* ***Evaluations of Argument Presentations* (25 points = 2.5%).**

7. **A Crosscutting Science Topic - Weather/Climate *(topic will vary according to instructor)\****

 **Unit Study - *Series of******Activities/Assignments (Individual):*** We will be studying weather/climate

 and concepts people (children and adults) need to understand to fully comprehend the issue.

 These activities/assignments will be partially done during class throughout the semester.

 Components are due on different days, but portfolios are due on Exam Day (week #16).

 **Assignments will include the following:**

* In-class experiments and assignments (assignments during class).
* The Nature of Science and *An Inconvenient Truth.*
* Questions on the Climate Change Study Guide.
* Review of websites in the Climate Change as a Theme to Teach Science PowerPoint.
* Dispositions of scientists and *Chasing Ice*.

**Course Evaluation Method (minimum grade of “C” required to pass course):**

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Assessment Type** | **Pts** | **%** |
| **1** | Five-E Water Odyssey Lesson ***(lesson topic will vary)*\***  |  **25** |  **2.5** |
| **2** | Review of 10 Favorite Internet Resources (Websites) |  **25** |  **2.5**  |
| **3** | Controlled Science Investigation (Science Research Project) |  **100** | **10.0** |
| **4** | Moon Observation Project |  **75** |  **7.5** |
| **5** | Next Generation Science Standards (NGSS) Discipline Presentation and Lesson Plan |  **125** | **12.5** |
| **6** | Written and Oral Scientific Argument (Individual Script **+** Team PPT **+** Presentation Evaluation) |  **125** | **12.5** |
| **7** | Global Climate Change Unit Study ***(unit study topic will vary)*\*** |  **150** | **15.0** |
| **Chapter Reading Questions** (Settlage & Southerland): Due at the beginning of each class discussion.  |  **25** | **12.5** |
| **Notebook Sections:** In-Class Work, Reading Questions, Weekly Focus or Reflection Questions. |  **75** |  **7.5** |
| **Post Assessment (Exam):** Global Climate Science/Experimental Design Assessment ***(content will vary )*\*** |  **25** | **12.5** |
| **Participation in Class**  |  **50** |  **5.0** |
| **Total**  | **1000** | **100.0** |

**Course Grading Scale:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Letter* | *Percent* | *Grade Points* | *Letter* | *Percent* | *Grade Points* |
| A | 95-100 | = 4.0 | C | 75-78 | = 2.0 |
| A- | 92-94 | = 3.67 | C- | 72-74 | = 1.67 |
| B+ | 89-91 | = 3.33 | D+ | 68-71 | = 1.33 |
| B | 85-88 | = 3.00 | D | 65-67 | = 1.00 |
| B- | 82-84 | = 2.67 | D- | 62-64 | = 0.67 |
| C+ | 79-81 | = 2.33 | F | Below 62 | = 0.00 |

**Policy on Makeup Tests, Late Work, and Incompletes:**

***Students are expected to attend all of the scheduled University classes and to satisfy all academic objectives as outlined by the instructor.*** Attendance includes meaningful, active involvement in all class sessions, class discussions, and class activities, as well as professional, ethical conduct in class. It is the student’s responsibility to make up all work missed during excused absences. In addition, it is the student’s responsibility to give the instructor notice prior to any anticipated absence and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work that is missed without any reduction in the student’s final course grade as a direct result an excused absence. Please see ***Classroom* Etiquette Policy** below for information pertaining to excused absences. The grade of Incomplete (“I”) is reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances.

**Classroom Etiquette Policy: (late arrivals, unexcused absences, electronic devices)**

Final grades may be affected by late arrivals and unexcused absences. Unavoidable absences include: family emergencies, illness, military obligations, and court imposed legal obligations. Students will not be penalized for absences due to participation in University-approved activities, including athletic or scholastic teams, musical and theatrical performances, and debate activities.

These absences must be accompanied by documentation. The instructor reserves the right to approve or disapprove any absence. ***More than two absences for a reason other than an approved FAU absence will result in loss of class participation points, which will lower your grade by one letter. Four late arrivals or early departures will result in the same letter grade deduction.*** Reasonable accommodation must also be made for students participating in a religious observance. University policy on electronic devices states: *In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions.* You may use a computer during class for note taking or other class activities. However, ***checking e-mail or using the internet (except during break time), may affect your class participation points.***

Dropping the Course: If you must drop this course, please complete all necessary forms. Otherwise, the instructor is required to enter a grade of “F” for the course.

**Disability Policy Statement:**

*In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS)—in Boca Raton, SU 133 (561-297-3880); in Davie, LA 203 (954-236-1222); or in Jupiter, SR 110 (561-799-8585) —and follow all SAS procedures.*

**Code of Academic Integrity policy statement:**

*Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see the University Code of Academic Integrity at:* [*http://fau.eduregulations/chapter4/4.001\_Code\_of\_Acacemic\_Integrity.pdf*](http://fau.eduregulations/chapter4/4.001_Code_of_Acacemic_Integrity.pdf)*.*

**Use of Student Work:**

All Teacher Education programs undergo periodic reviews by accreditation agencies and the state education department.  For these purposes samples of students’ work are made available to those professionals conducting the review.  Student anonymity is assured under these circumstances.  If you do not wish to have your work made available for these purposes, please let the professor know before the start of the second class.  Your cooperation is appreciated

Please Note: Due to the possibility of the implementation of new, required state standards, the Competency Assessments and rubrics within this course may change during the semester.  If changes are made, you will receive advance notification.

Bibliography\*

**Online Science Standards**

Next Generation Science Standards <http://www.nextgenscience.org/>

Florida Science Standards <http://learningcenter.nsta.org/state.aspx?action=start&state=FL>

Access Points <http://www.floridastandards.org/Standards/AccesspointSearch.aspx>

American Association for the Advancement of Science (AAAS) Benchmarks for Science Literacy

 [%2Eedu%2Ftaylorar%2F&txtURIOld=%2Ftools%2Fbenchol%2Fbolframe%2Ehtm](http://www.project2061.org/publications/bsl/online/index.php?txtRef=http%3A%2F%2Fpeople%2Euncw%2Eedu%2Ftaylorar%2F&txtURIOld=%2Ftools%2Fbenchol%2Fbolframe%2Ehtm)

**Science Organizations**

American Association for the Advancement of Science <http://www.aaas.org/>

Florida Association of Science Teachers <http://www.fastscience.org/>

Harry and Rosemary Wong’s Website <http://teachers.net/wong/>

National Aeronautics and Space Administration <http://www.nasa.gov/home/index.html>

National Academy of Science <http://www.nas.edu/>

National Marine Educators Association <http://www.marine-ed.org/>

National Oceanic and Atmospheric Administration <http://www.noaa.gov/>

National Science Foundation <http://www.nsf.gov/>

National Science Teachers Association [www.nsta.org](http://www.nsta.org)

Project 2061 of the American Association for the Advancement of Science [www.project2061.org](http://www.project2061.org)

Science Careers <http://recruit.sciencemag.org/>

**Favorite Supply Companies**

Stephen Spangler Website <http://www.stevespanglerscience.com/>

Science Kit & Boreal Laboratories (1-800-828-7777) [www.sciencekits.com](http://www.sciencekits.com)

Note:\* *See* c*omplete internet resource bibliography (PPT) on Blackboard under course resources.*