

University of North Florida



*Active leaders and responsive partners
within diverse learning communities*

SCE 6117: Science Methods for Elementary Teachers

Candidate dispositions for the development and demonstration of ethical and professional attitudes and beliefs.

On-going, active reflection on professional practice.

Multiculturalism through educators who value diversity and advocate for the success of all students within diverse learning communities.

Professional growth of pre-service and experienced educators and other helping professionals.

Academic programs that are rigorous, standards-based, and model and apply innovative and enduring ideas about teaching and learning.

Scholarship for advancement of the professional knowledge base.

Service to the University, P-12 schools, the profession, and the community.

Syllabus

Course Number:	SCE 6117
Course Title:	Science Methods for Elementary Teachers
Number of Credit Hours:	3
Required or Elective:	Required in Elementary M.Ed. track
Term:	Fall 2006
Day and Time:	Mondays 7:30-10:15 PM
Location:	UNF 843
Course web site:	http://blackboard.unf.edu
Professor/Instructor:	Dr. C. Cavanaugh
Office:	50/2820
Office Hours:	Tuesday 11 AM—1 PM and Thursday 11 AM --Noon; others by appointment
Telephone:	904-620-1751
Email Address:	ccavanau@unf.edu
Instructor web site:	http://www.unf.edu/~ccavanau

Required text:

Florida Curriculum Frameworks for Science. <http://digitalfrog.com/resources/florida.html> ; http://courses.nefec.org/fcw/Document_Files/Week_2/sciall.pdf, also supplied on CD.

Course Description

This course is aligned with the College Conceptual Frameworks and is an introduction to the classroom applications and a study of the relationship of teachers and schools to the methods of teaching science in an elementary classroom. This course provides the framework for the development of scientific and technological literacy and teaching skills. It examines instructional methods, materials, and curricula for teaching the sciences in grades K-5. The course is designed to initiate the future elementary school teacher into the realm of process-oriented learning and scientific inquiry. It assumes that the learning of science in schools should be facilitated by a knowledgeable, enthusiastic teacher who is aware of individual learners in multicultural and multilingual contexts and who uses appropriate methodologies to meet their needs. This course is designed to develop the knowledge, skills, and dispositions to effectively teach science at the elementary level. The course content strongly reflects the curricular emphases of the National Science Teachers Association, the Florida Sunshine State Standards and the Elementary Content Area Standards.

The following concepts are a framework for the course.

- Teachers are committed to students and their learning.
- Science is important for all students.
- Teachers know the subjects they teach and how to lead students in learning those subjects.
- There are many ways to teach elementary science well, but learning science has to be an active process: children learn science by doing science.
- There are principles based on theory, research and experience to guide elementary science teaching.
- Teachers are responsible for managing student learning.
- Teachers think systematically about their practice and learn from experience.
- Teachers are members of learning communities.

Course Goals

The primary goal of this course is to aid in the preparation of classroom teachers and educational leaders. Essential to this are the beliefs that professional preparation should include these key components: a broad-based theoretical foundation for content, pedagogical and professional knowledge; a systematic and focused continuum of classroom and field experiences for linking knowledge and skills to practice; and a philosophical foundation that supports the development and application of the dispositions appropriate to the profession in all stages of preparation.

Diversity Considerations

This course will address diversity issues, including ESE/ESOL considerations related to the introduction to education. Instructors of this course will model strategies proven to be effective with ESOL and special needs students in the delivery of course content. Teacher candidates will be expected to reflect on these strategies and accompanying learning experiences to result in knowledge of and skill in using effective practices that enhance the learning of ESOL and other special needs learners as evidenced through successful completion of assignments.

Technology Considerations

Assignments will be required periodically in class or via the Blackboard® (Bb) Online Course Information Management System. LOG IN to the Blackboard® site by accessing <http://blackboard.unf.edu>

All current UNF students, faculty and staff members now use the same userID and password to login to Blackboard as for Osprey, UNF Webmail (Horde), myWings, and desktop computers on campus. If you have not recently logged into myWings, osprey, UNF Webmail, or a campus computer, Information Technology Services recommends that you reset your password by visiting <http://www.unf.edu/dept/its/ospaccts/>. The default password format is now FLSSSSSS, where 'F' stands for your first initial (capitalized), 'L' stands for your last initial (capitalized), and 'SSSSSS' stands for last seven digits of your Social Security Number. After resetting your password, you should then login to UNF Webmail to change it from the default value to a password of your choice. This then becomes your Bb password as well.

Please visit <http://www.unf.edu/dept/its/accounts/single-signon.html> for more information. If you have questions, please contact the ITS Support Center at its-support@unf.edu or 620-HELP (4357).

Once you have logged into Blackboard, please click on this class, SCE 6117, on the right side of the screen. After the course appears, click on the Tools button on the left and update your Personal Information to forward university email your preferred e-mail address.

Technology will be an integral portion of this course. It will be used to communicate, both synchronously and asynchronously, provide assignments and provide discussion questions. In addition, other tools such as computers, projectors, digital cameras, software and handheld computers will be used to demonstrate how technology can be integrated into the classroom to impact learning and subsequently model the impact that can occur in classrooms.

Course Objectives

Upon successful completion of this course:

- 1.0 Students will define science as the systematic search for patterns. (Observing, doing). K.
- 2.0 Students will demonstrate proficiency in performance of both the basic and integrated science process skills and knowledge of various forms of assessment in science education. (Observation and inference, measurement, prediction and hypothesizing, data collection and analysis). K, S, D, I.
- 3.0 Students will analyze the learning and memory mechanism, which affect the learning of science in multi-cultural and multilingual contexts. (Research on learning and memory, learning process, prior-knowledge). K, D, I.
- 4.0 Students will acquire techniques for promoting meaningful science learning in a problem-solving, active approach and their application in teaching with respect to correlating state and national standards. K, S, D, I.
- 5.0 Students will explore resources, which enhance the teaching and learning of the knowledge, comprehension, application and evaluation of appropriate strategies and models for the teaching of science. (Human resources, multimedia, informal learning settings, professional journals). K, S, I.

6.0 Students will demonstrate knowledge and application of technology as tools in the learning process and integrate computers as a functional aspect of teaching and learning. K, S, I.

In addition, students will demonstrate

- Knowledge, comprehension, application, and evaluation of appropriate strategies and models for the teaching of science.
- Understanding of the problem-solving process, knowledge of problem-solving skills and strategies, their application in teaching, and an awareness of one's own problem-solving abilities.
- Proficiency in performance of basic and integrated science process skills and analyze the results of a process-oriented approach.
- Knowledge of various forms of assessment in science education, and an understanding of assessment strategies to use with students with special needs including language minority students.
- Knowledge and application of technology as tools in the learning process.
- A variety of instructional strategies for teaching selected topics in the elementary curriculum.
- Knowledge of the impact of state and national standards on the teaching of science.
- Cross-curricular integration of science with other disciplines.
- An understanding of how children, including special needs students and language minority students learn science.

Note: Common to all objectives is the use of a combination of lecture, discussion, demonstration, multimedia, journal writing, collaborative and cooperative small group inquiry, research, presentation, literature review and observational experiences.

Objective Matrix

Objective	Knowledge	Skill	Disposition	Impact
1.0	X			
2.0	X	X	X	X
3.0	X		X	X
4.0	X	X	X	X
5.0	X	X		X
6.0	X	X		X

Please notify the instructor within the first week if a reasonable accommodation to a disability is needed for this course. A letter from the Student Disability Office must accompany this request.

Course Assignments, Expectations and Grading Procedures

Grading Structure

1	Professional Conduct is necessary to earn an excellent or good grade.	
2	Concept Mapping	5
3	Lesson Plan	15
4	Mini-lesson	20
5	Professional Development Plan	20
6	Elementary Science Teaching Observation	15
7	Science Education Issue Paper	15
8	Forum	10
9	Optional extra credit for participating in and reporting on Saturday professional development workshops	

All written work must be typed or word-processed, except for forms.
10% per week penalty for late work.

A = 90-100 A: Excellent performance; no more than one unexcused absence
B = 80-89 B: Good performance; no more than two unexcused absences

C = 70-79 C: Fair performance; fulfillment of basic requirements
 D = 60-69 D: Poor performance; lack of basic criteria

Florida Accomplished Practices for Professional Educators of the 21st Century

ASSESSMENT: Uses assessment strategies (traditional and alternate) to assist the continuous development of the learner.

COMMUNICATION: Uses effective communication techniques with students and all other stakeholders.

CONTINUOUS IMPROVEMENT: Engages in continuous professional quality improvement for self and school.

CRITICAL THINKING: Uses appropriate techniques and strategies that promote and enhance critical, creative, and evaluative thinking capabilities of students.

DIVERSITY: Uses teaching and learning strategies that reflect each student's culture, learning styles, special needs, and socio-economic background.

ETHICS: Adheres to Code of Ethics and Principles of Professional Conduct of the Education.

HUMAN DEVELOPMENT AND LEARNING: Uses an understanding of learning and human development to provide a positive learning environment that supports the intellectual, personal, and social development of all students.

KNOWLEDGE SUBJECT MATTER: Demonstrates knowledge and understanding of the subject matter.

LEARNING ENVIRONMENTS: Creates and maintains positive learning environments in which students are actively engaged in learning, social interaction, cooperative learning and self-motivation.

PLANNING: Plans, implements, and evaluates effective instruction in a variety of learning environments.

ROLE OF THE TEACHER: Works with various education professionals, parents, and other stakeholders in the continuous improvement of the educational experiences of students.

TECHNOLOGY: Uses appropriate technology in teaching and learning processes.

Assignment details and rubrics:

1. Professional conduct

Read assignments and engage in a positive way in all class discussions and activities. On-time attendance is required. Know and follow university policy regarding academic honesty. Demonstrate safe practices. In your online work, follow standards of netiquette: be accountable for what you send, acknowledge online sources you reference.

2. Concept Mapping Activity

Course Objective(s): 2, 4, 5, 6
 Florida Educator Accomplished Practices: 4, 8
 Subject Area Competency(ies): Elementary Science 15
 ESOL Competency(ies): 12
 ISTE Competency(ies): 5C
 Learned Society Competency(ies): ACEI 2A, 2C

Because science is conceptual subject, it is important for learners to have tools for developing concepts. Concept mapping is a valuable tool in determining a student's current cognitive status, and for helping students' concepts

to mature. Create a concept map that illustrates a concept taught at the elementary level in science. You will work with model concept maps in class and in your text.

Concept Map Assignment:

Your concept map illustrates visually the topics that relate to a broad science concept. The illustration shows details about the relationships among the topics. Choose a main concept from the list here, and organize topics below. Rank topics from general to more specific. Connect topics with links that describe their relationship. Because your lesson plan will require a concept map, it is recommended that you begin learning about your lesson plan topic with this concept map assignment. The concept map may be turned in on paper or electronically using Word, Inspiration, PowerPoint, Visio or Cmap (<http://cmap.ihmc.us/download/>).

Elementary science concepts:

Physical Science:

- Matter—properties, measurement, states, chemical reactions, elements
- Motion—force, machines, gravity, speed, sound
- Energy—light, heat, electricity, magnetism, transfer of energy

Life Science:

- Characteristics of organisms—classification, environments, structures, cells, disease
- Life cycles—heredity, reproduction, genetics, adaptations, evolution, extinction
- Environments—food webs, resources, change, energy sources, populations

Earth and Space Science:

- Earth—land, landforms, water, sky, change, geologic history, climate
- Sky—solar system, motion, gravity, solar energy, weather

Concept Map Rubric: (5 points)

Value	0	1	2
Concepts	Incomplete, illogical	Complete, logical	Complete, logical, appropriate connections
Creativity	Not evident	Exhibited	
Presentation	Errors of spelling and language	Largely free of errors of spelling and language	Easily read, free of errors of language and spelling

3. Lesson Plan

Course Objective(s): 2, 4, 5
 Florida Educator Accomplished Practices: 1, 5, 8, 10
 Subject Area Competency(ies): Elementary Science 15
 ESOL Competency(ies): 12, 15, 16, 17
 ISTE Competency(ies):
 Learned Society Competency(ies): ACEI 2A, 2C, 2I, 3D, 4

Your lesson plan may focus on any science concept. The lesson plan must include a hands-on component. An important step in the lesson process will be reflection on teaching. The lesson plan is an individual project. The thematic materials may be a group project focused on a set of science concepts related to the theme adopted by the class. You will teach one activity from the lesson or thematic materials in class as a mini-lesson.

Lesson Plan Checklist:

1. Lesson title
2. Purpose paragraph describing lesson conceptual objectives, importance, rationale, sequence, and intended learning outcomes
3. Connections to Sunshine State Standards
4. Materials needed by teacher and students

5. Safety and management guidelines
6. Lesson introduction specifying expected duration of events, important questions for discussion, relation to prior knowledge and how knowledge in this lesson will be developed in future lessons
7. Development of lesson, including hook or invitation, description of events, the teacher’s role and student activities, application of the learning cycle
8. Lesson closure, detailing how lesson will conclude, and connections to other content
9. Assessments of learning, demonstrating how you will know that the intended learning outcome has been achieved.

Lesson Plan Evaluation Rubric: 15 Points

Value	1 Meets few of the criteria	2 Meets most of the criteria	3 Meets or exceeds all criteria
Complete, includes all elements: <ul style="list-style-type: none"> • Lesson title • Objectives, importance, rationale, sequence, and learning outcomes • Materials • Safety and management guidelines • Duration of events, questions for discussion, relation to prior knowledge and how knowledge in this lesson will be developed in future lessons • Hook or invitation, description of events, the teacher’s role and student activities, application of the learning cycle • How lesson will conclude, and connections to other content • Assessments of learning 			
Linked to appropriate standards			
Lesson provides challenging, relevant, and exciting learning experiences			
Professionally written			
Effective and creative use of materials			

Before you begin planning the lesson ask yourself:

- Is the lesson I have selected, student centered or teacher centered? If it is teacher centered, how can I revise it to be more student centered?
- What knowledge, skills or attitudes do I want the students to have as a result of experiencing this lesson?
- What materials are needed to accomplish this lesson: ideally, practically?
- How will I hook students? What strategy will be my invitation to learn or motivation?

As you plan think about the following:

- How will this lesson relate to students’ every day experiences? How will this lesson relate to what they already know and understand so that knowledge construction will be facilitated?
- How much time is needed for students to complete the lesson, inquire, experiment, and reflect?
- What choices will the children have in the materials they use or what they do with them?
- What kind of data will be collected - do the children know how to collect data of this sort or is a direct instruction mini-lesson needed before they can begin?
- Exactly what can I say to the children to challenge them to be scientists and explore the problem?
- How will I assist children to make sense of knowledge they have generated from their experience?
- What questions can I ask to encourage children to think about what they have done, how they have organized their data and how the data can be interpreted?
- What questions can I ask to encourage children to analyze, synthesize and critically reflect on what they have done and what they have learned?
- How will I assess whether the students have achieved the goals set for the lesson?

4. Mini-lesson

Course Objective(s): 2, 3, 4, 5
 Florida Educator Accomplished Practices: 2, 8, 9, 10
 Subject Area Competency(ies): Elementary Science 15
 ESOL Competency(ies):
 ISTE Competency(ies):
 Learned Society Competency(ies): ACEI 2C, 3A, 3D

You will teach one activity from the lesson or thematic materials in class as a mini-lesson. The mini-lesson may be taught by individuals or groups. It should be a 15-20 minute hands-on section of a lesson that relates to either your lesson plan or thematic materials. Prepare materials and handouts for the class.

Mini-lesson checklist:

- Includes a hands-on component
- Presenter is prepared and organized, knows the content and the lesson
- Teaches a science concept addressed in state standards
- Lasts 15-20 minutes
- Presenter provides the context for the lesson by describing what knowledge and activities come before and after the lesson, and describes how the learning will be assessed
- Use concrete examples, detailed instructions, guided practice, feedback, and open ended questions

Mini-Lesson Evaluation Rubric: (20 points)

Value	1 Meets few of the criteria	3 Meets most of the criteria	5 Meets or exceeds all criteria
Complete: accomplishes all objectives of the assignment			
Presenter is prepared and organized, knows the content and the lesson			
Content and materials are engaging and appropriate for the target learners			
Use concrete examples, detailed instructions, guided practice, feedback, and open ended questions			

5. Professional Development Plan and Teaching Materials

Educators are lifelong learners, and many recognize the value of self-directed learning tailored to individual goals. The acquisition of pedagogical knowledge and skill is most effective in an authentic context in which a teacher can apply learning directly in the classroom. This assignment involves diagnosing your science content knowledge, and selecting an area for growth on which to focus. You will then develop educational materials for students to demonstrate your new knowledge and strategies. The materials include original standards-based classroom learning materials in any content area for any grade level, with guidelines for their use by learners. The materials may serve as the basis for the mini-lesson, and will be shared beyond the class for broad use.

Thematic materials checklist:

- ✓ Content area focus
- ✓ Reason for your choice of the content area
- ✓ A description of the methods you used to improve your knowledge in the content area
- ✓ Audience (student grade levels) for the materials you develop

- ✓ Connection to content area and student learning rationale for materials
- ✓ Content standards addressed
- ✓ Instructions for teachers and students
- ✓ Original classroom materials in electronic and physical forms
- ✓ Learning assessment method

Thematic Materials Rubric 20 points

Value	2	4
Completeness	Incomplete, lacking 2 or more items	All items present
Standards and thematic connections	Connection between theme and standards and activities not evident	Connection between theme and standards and activities evident
Quality of activities, instructions and assessments	Activities are not important, engaging, or justified; instruction is unclear	Activities are important, engaging, and justified; instructions are clear
Materials	Inappropriate for goal or are of poor quality; do not enhance instruction	Support goals, are of high quality; enhance instruction
Instructional strategy	Materials do not support active, engaged learning	Materials support active, engaged learning

6. Elementary Science Teaching Observation

Observing others teach science enables you to observe and interact with students and teachers and to reflect on the effectiveness of curricula and methods explored during this course. Make arrangements to observe an elementary classroom science lesson. Use the Observation Notes form to document your visit. Turn in your notes form with a one-page summary/response for the classroom visit. If you are unable to arrange to see another teacher teach in the classroom, you may arrange to see a teacher via video. An option is to ask a colleague to allow a lesson to be video-recorded for you, and another option is to borrow a recording from the course instructor.

Observation Note Format

Name _____ Date of observation _____
 Students in the class: Regular ESOL ESE Other
 School Name and Address _____
 Teachers _____ Grades and Subjects _____
 Start and end time of observation _____
 Topic or concept observed _____
 Activities and processes observed _____
 State Science standards addressed _____
 Materials used (technology, handouts, books, assessments, manipulatives, other) _____
 Assessment methods used _____
 Management techniques related to safety, adaptations for diverse learners, interdisciplinary connections _____
 Reflections and other notes _____
 Analysis of instructional strategies and effectiveness of lesson for students _____
 Interview with at least two teachers about:
 Their beliefs about teaching science _____
 The strategies they use to teach science _____
 Interview at least two children to find out:
 What they believe science is _____
 What they believe people do when they do science _____
 How they'd like to learn science in school _____

Observation Evaluation Rubric: (15 points)

Header:	Lesson	Analysis:	Connections:	Interviews:	Presentation:
school, teacher, lesson	overview: concepts	strategies, management,	standards, interdisciplinary	teachers and students	your written work

title, audience	taught	reflections			
2 All present	3 Clear overview	3 Very descriptive	2 Connections listed, with others possible	3 4 interviews summarized	2 Organized, few errors
1 Most present	2 Somewhat clear	2 Few descriptions	1 Connections listed only	2 Interview or description missing	1 Organized, some errors
0 Most absent	1 Vague overview	1 Superficial mention	0 Missing or absent	1 Little summary, or few interviews summarized	0 Poor flow, many errors
	0 Confusing overview	0 Missing or absent		0 Missing or absent	

7. Science Education Issue Paper

<p>Course Objective(s): 2, 7, 10 Florida Educator Accomplished Practices: 2, 4, 8 Subject Area Competency(ies): ESOL Competency(ies): 12 ISTE Competency(ies): Learned Society Competency(ies): ACEI 5A</p>
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Your issue paper will describe an issue in science education. Possible issues may be:

- Gender differences in science interest and achievement
- Authentic assessment of science learning
- Safety concerns in science classrooms
- Adaptation of science lessons for diverse learners
- Current and future trends in elementary science education
- Status of standardized high-stakes tests for science
- Review of science education programs internationally
- Features of highly effective science teachers/programs
- Altering misconceptions in science
- What is science literacy?
- The role of concept maps in learning science
- How science standards impact science teaching
- The value of learning science outside the classroom
- Effective technology for learning science

In a 4-6 page double-spaced paper using 12-point font, define the issue you are investigating. Discuss the importance of the issue to children, teachers, parents, and society. Read reports from a variety of current sources, including a balance of print and electronic media. Make sense of the different viewpoints on the issue and communicate them clearly. Use the information you've read to make recommendations about how the issue should be handled, including your own viewpoint. Use standard APA or MLA style to list at least four references for the paper.

- Reaction (*Affective domain, feeling*).
What was your emotional response to the information you read about the issue? Provide citations from the texts that illustrate your response.
- Relevance (*Cognitive domain, thinking*).
How do your sources treat the issue, and how do they compare and contrast? Is the issue meaningful, and for whom? What are the alternate points of view on the issue? Provide citations to support your perspective and others.
- Responsibility (*Psychomotor domain, doing*).
How will the knowledge and perspectives gained from this reading be used in your professional

practice? Give examples of possible applications in your personal or professional life. Discuss questions you still have about the issue.

Issue Paper Evaluation Rubric: (15 points)

Value	Meets or exceeds all criteria: 3	Meets most criteria: 2	Meets few criteria: 1
Professional appearance and structure: 4-6 page, Double-spaced, 12-point font			
Cohesive organization: Make sense of the different viewpoints Communicate them clearly			
Important and clear issue: Children, Teachers, Parents, Society			
Addresses Reaction: your own viewpoint Relevance: importance of the issue Responsibility: recommendations about how the issue should be handled			
Appropriate references: Variety of sources, Balance of print and electronic media, Standard APA or MLA style, At least four references			

8. Forum Discussion and Online Participation

You are expected to stay current with the online portion of the class and take part regularly in the discussions and other online activities, at <http://blackboard.unf.edu>. New discussion topics will be added regularly.

9. Professional Development Workshops

Periodically, you will be notified about an optional Saturday professional development workshop in Northeast Florida for science education. If you elect to participate in a workshop, you will receive curriculum materials, and you can receive extra credit by turning in a 1/2 page reflection.

Possible workshop topics:

Florida Black Bear	http://www.floridaconservation.org/educator/blkbear.htm
Great Water Odyssey	http://thegreatwaterodyssey.com/about/html
Jacksonville Zoo	http://www.jaxzoo.org/discover/teachers/TeacherGuide.asp
Project Learning Tree	http://www.plt.org
Project WET	http://www.projectwet.org
Project WILD	http://www.projectwild.org
Schoolyard Wildlife	http://www.floridaconservation.org/educator/schoolya.html

Course Policies and Guidelines

COLLEGE OF EDUCATION AND HUMAN SERVICES POLICIES

1. Americans with Disabilities Act (ADA) Policy. The College of Education and Human Services complies with ADA requirements in making reasonable accommodations for qualified students with disabilities. Students desiring reasonable accommodations should contact the UNF Office of Disabled Services (Founders Hall 2120; telephone: 904/620-2769) and are encouraged to inform the instructor as early in the semester as possible regarding desired accommodations.

2. College Undergraduate Admission Policy. In order to earn credit toward an undergraduate degree in the College of Education and Human Services, students must be admitted to a COEHS undergraduate program of study. Admission to the University does NOT in and of itself constitute admission to a given program of study. Transfer students cannot take more than 14 UNF hours toward any COEHS undergraduate degree without first having been fully admitted into a program of study.

Prior to being considered for full admission into an undergraduate program of study, students must (a) submit acceptable scores on all parts of the College-Level Academic Skills Test (CLAST) and (b) present official transcripts documenting a cumulative undergraduate GPA of 2.5 or better on a minimum of 60 semester hours from a regionally accredited college or university. Students are encouraged to consult the Undergraduate Catalog and/or contact the College's Office of Student Services (Schultz Hall 2305; telephone: 904/620-2530) for information regarding admission to a specific undergraduate program of study.

3. University Enrollment Policy. Only those students who are admitted to the University are entitled to enroll in classes, and only those students who are enrolled in a given course are permitted to attend class meetings for that course. Sitting through a class without registering does not constitute enrollment. Instructors are authorized to bar students who are not enrolled in a course from attending class sessions until evidence of enrollment is presented to the instructor. Even if unenrolled students are allowed via the instructor's oversight to remain in a class, university policy prohibits students from being added to a class roster after the reinstatement deadline. The primary responsibility for assuring that a student is enrolled in a course belongs to the student. Students are therefore encouraged to check their enrollment status several times during each semester with an advisor or via the UNF website.

4. Policies Governing Student Conduct. The University of North Florida has adopted a Student Conduct Code in order to promote responsible behavior for all students and to assure a physically, emotionally, and intellectually safe university community. This code addresses issues that may threaten the safety and order of the university environment and provides procedures and remedies for addressing these issues. Specific issues addressed include, but are not limited to, sexual misconduct; endangerment; harassment; hazing; possession/use of weapons, alcohol, and illegal drugs; damage or destruction of property; malicious mischief; computer misuse; and falsification/fraud. Students who are aware of and/or feel they are victims of any activity in violation of the Student Conduct Code should report the activity to the University Police or the appropriate campus administrator. The conduct code is available in its entirety on the University website at web address <http://www.unf.edu/studentaffairs/handbook/HB2002-2003.pdf>

5. Academic Integrity Policy. The University of North Florida has adopted a strict policy on academic integrity. As noted in the UNF 2003-2004 Undergraduate Catalog (p. 35) and the UNF 2001-2002 Student Handbook (p. 23), violations to academic integrity include, but are not limited to cheating; fabricating and falsifying information or citations; submitting the same work for credit in more than one course; plagiarizing; providing another student with access to one's own work to submit under this person's name or signature; destroying, stealing, or making inaccessible library or other academic resource material; and helping or attempting to help another person commit an act of academic dishonesty. The full policy on academic integrity is available on the University website at web address <http://www.unf.edu/studentaffairs/handbook/HB2002-2003.pdf>

The Academic Integrity Policy affords University instructors authority to assign penalties for these offenses. For example, the instructor may assign a grade of "F" on the assignment in question or for the course. In the case of flagrant violations of the Academic Integrity Policy, the instructor may recommend additional specific penalties to the university administration, including referral for academic counseling, expulsion from a program of study, denying of degree, expulsion from the University, or revocation of a degree already granted.

6. E-mail Policy. The University of North Florida's policy on student e-mail allows academic and service units of the University to use e-mail as the primary means for communicating certain types of information to students. Although individual instructors may determine that "external" (i.e., non-University-provided) e-mail accounts are a suitable means for communicating with students, the University policy specifies that the University-provided e-mail address serve as the "official" e-mail address for purposes of formal electronic communication with students. All students should become knowledgeable of their University-provided e-mail address and either check their account regularly or arrange for all e-mail delivered to their account to be forwarded to an external e-mail account of their choice. Students can find out their e-mail account username, reset their password, and set forwarding options by visiting <http://www.unf.edu/compserv/guidelines/glemail.html>

INSTRUCTOR POLICIES

- **Attendance: Attendance at each class meeting is required because of the practical, hands-on nature of instruction.**
- Academic integrity: Follow the guidelines of the UNF Student Handbook located at <http://www.unf.edu/studentaffairs/mainpage.html>
- **Assignment and quality of work: Completion of all assignments is expected during the week indicated. Assignments submitted after the due date are considered late, and a 10% reduction in grade will occur for each class day the assignment is late.**

Schedule

<i>Date</i>	Topic	Reading Assignment	Assignment Due
8/28	Introductions, Nature of Science and the Science Teacher, Science Literacy and Habits of Mind, Learning Cycle		
9/4	Holiday—no class		
9/11	<i>Professional Development Pretest and Planning</i> Misconceptions, Brain Research, Multiple intelligences		<i>Log in to Blackboard, print full syllabus</i>
9/18	Discrepant Events, Constructivism,	FCF Intro & 1	Online forum 1 <i>Bring an item for teaching science</i>
9/25	Grouping, Demonstrations, Play, Questions		Professional development plan due
10/2	Media: Literature & More Concept Maps	FCF 3	Online forum 2
10/9	Adapting Instruction for Inclusion and Exceptional Education Science Goals, Standards, Benchmarks		Classroom observation Due
10/16	Project-based learning Lesson planning		Concept map due
10/23	Field trips, science outside the classroom	FCF 3 & 4	
10/30	FCAT Science, Assessing Science Learning Issue paper sharing	FCF 6	Issue paper due
11/6	<i>Project work night—no class</i>		
11/13	Interdisciplinary Teaching Thematic Units	FCF 8	Lesson plan due Online forum 3
11/20	Technology	FCF 5	
11/27	Resources: Resource Fair Legal and Ethical Issues, Safety	FCF 7	<i>Bring science teaching materials</i> Online forum 4
12/4	Professional Development		Professional Development materials due Online forum 5
12/11	Mini lesson presentations (7:30-9)		Mini-lesson

Reading: FCF=Florida Curriculum Frameworks

Blackboard <http://blackboard.unf.edu>

Fall 2006 Science Calendar:

Fire Prevention Week: October 8-14. <http://www.nfpa.org/displayContent.asp?categoryID=1194>

Earth Science Week: October 8-14. <http://www.earthsciweek.org/>

Orionid Meteor Shower. October 15-29. <http://comets.amsmeteors.org/meteors/calendar.html>

Chemistry Week: October 22-28. <http://www.acs.org/new>

Florida Association of Science Teachers: Oct. 12-14, Gainesville. <http://www.fastscience.org>

2006 Eclipses <http://sunearth.gsfc.nasa.gov/eclipse/OH/OH2006.html#2006Sep07P>

Leonid Meteor Shower: November 13-20. <http://comets.amsmeteors.org/meteors/calendar.html>

Geminid Meteor Shower: December 6-19. <http://comets.amsmeteors.org/meteors/calendar.html>

Bibliography

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- Gardner, H. E. (1993). Multiple intelligences: The theory in practice. New York: Basic Books.
- Gagne, R. (1997). The conditions of learning and theory of instruction. New York: Holt, Rinehart and Winston.
- Jonassen, D. H. (1991). Objectivism vs. Constructivism. Educational Technology Research and Development, 39(3), 5-14.
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- Novak, J. (1977). A theory of education. Ithaca, NY: Cornell University Press.
- Papert, S. 1996. The connected family. Atlanta, GA: Longstreet Press.
- Piaget, J. (1974). Cognitive development in children: The Piaget papers, Journal of Research in Science Teaching, 2,170-230.

Websites

- Educator Accomplished Practices (AP) <http://www.beaconlc.org/ctech/apwebsite/APpage.htm>
- FL DOE <http://www.fldoe.org/>
- US DOE <http://www.ed.gov/index.jsp>
- FL FCAT <http://www.firn.edu/doe/sas/fcathome.htm>
- Concept Mapping <http://www.mindtools.com/mindmaps.html>
- Code of Ethics and Principles of Professional Conduct of the Education Profession in Florida
<http://www.firn.edu/doe/bin00061/publications/ethics.pdf>
- Educator Accomplished Practices-Teachers of the 21st Century
<http://www.firn.edu/doe/bin00061/publications/12practices.pdf>
- Subject Matter Content Standards for Florida Teachers
<http://www.firn.edu/doe/bin00061/publications/smcstandards.pdf>
- Performance Standards for Teachers of English for Speakers of Other Languages
<http://www.firn.edu/doe/bin00011/perstand.htm>
- Sunshine State Standards <http://www.firn.edu/doe/cgi-bin/doehome/menu.pl>
- NCATE Unit Standards (National Council for Accreditation of Teacher Education)
http://www.ncate.org/2000/unit_stnds_2002.pdf
- NCATE Program Standards: Elementary, Secondary <http://www.ncate.org/standard/programstds.htm>

NCATE Technology Standards

<http://www.ncate.org/standard/new%20program%20standards/iste%20001.pdf>

INTASC Standards (Interstate New Teacher Assessment and Support Consortium)

<http://www.ccsso.org/intascst.html>

Resources for Elementary Science:

Activities:

Bosak, S. 1991. *Science Is...* Ontario, Canada: The Communication Project.

AIMS: Activities Integrating Mathematics and Science. <http://www.aimsed.org> 888-733-2467.

GEMS: Great Explorations in Math and Science. <http://www.lhs.berkeley.edu/gems/GEMS.html>

Journals:

Elementary School Science Journal of Elementary Science Education,

<http://science.coe.uwf.edu/JESE/JESE.HTM>

School Science and Mathematics, School Science and Mathematics Association, Department of Curriculum and Foundations, Bloomsburg University, 400 E. Second St., Bloomsburg, PA 17815-1301 (717) 389-4915

Science and Children, NSTA, 1840 Wilson Blvd., Arlington, VA 22201-3000 (703) 243-7100

<http://www.nsta.org>

Science Education Directory of Periodicals: <http://www.nap.edu/readingroom/books/rtess/8.html>

Professional Organizations:

American Association for the Advancement of Science (AAAS), publishers of *Science Education News* and *Science for All Americans*. <http://www.aaas.org> 1333 H St., NW, Washington, DC 20005 (202) 326-6400

Florida Association of Science Teachers (FAST)

National Science Foundation, Directorate for Education and Human Resources, <http://www.nsf.org> 4201 Wilson Blvd., Arlington, VA 22230 (703) 306-1600

National Science Teachers Association (NSTA), 1840 Wilson Blvd., Arlington, VA 22201-3000 (703) 243-7100

<http://www.nsta.org>

Directory of Organizations and Resources: <http://www.nap.edu/readingroom/books/rtess/10.html>

Web:

Resources for Teaching Elementary Science, National Academy Press,

<http://bob.nap.edu/readingroom/books/rtess>

Also at National Academy Press <http://www.nap.edu>

Science for All Children, Every Child a Scientist, National Science Education Standards, How People Learn

Ask ERIC Lesson Plans <http://ericir.syr.edu/Virtual/Lessons>

Ask the Experts at Scientific American <http://www.sciam.com/askexpert/index.html>

Assessing the Whole Child, CRESST <http://www.cse.ucla.edu/CRESST/pages/products.htm>

Beakman's World <http://www.beakman.com>

Eisenhower National Clearinghouse, for K-12 math and science <http://www.enc.org>

ERIC Clearinghouse for Science, Math, and Environmental Education, <http://www.ericse.org/>

Mad Scientist Network <http://www.madsci.org>

NASA Observatorium for Earth and Space <http://www.observe.ivv.nasa.gov/nasa/core.shtml>

NASA Spacelink <http://spacelink.nasa.gov/.index.html>

Newton's Apple <http://www.pbs.org/ktca/newtons>

Science Questions and Answers <http://www.last-word.com>

Science Technology Daily Review <http://SciTech.com>

Science Toys <http://scitoys.com/net4kids.html>

Sunshine State Standards <http://www.firn.edu/doe/menu/sss.htm>

US Geological Survey education site <http://www.usgs.gov/education>

Volcano World <http://volcano.und.nodak.edu>

Weather Classroom <http://www.weather.com/education>

Yucky Page <http://www.yucky.com>