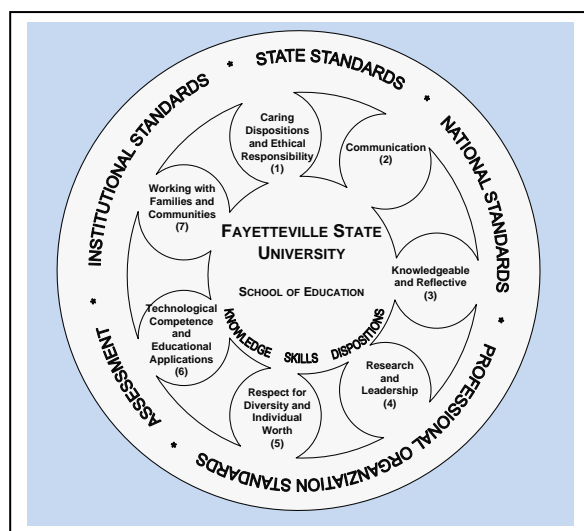




1200 Murchison Road
Fayetteville, North Carolina

School of Education
Department of Elementary Education
Phone (910) 672-1538



SYLLABUS

ELEM 401 – Teaching Math and Science in K-6 Spring 2012

I. Locator Information:

Instructor:	Teresa M. Reynolds, Ed.D
Course # and Name:	ELEM 401– Teaching Math and Science in K-6
Office Location:	Butler 348
Semester Credit Hours:	6
Total Contact Hours for Class:	96
Office hours:	Tues. 11- 5 and Thur. 10-4
Day and Time Class Meets:	Thursday 4:00 – 7:50 pm
Office Phone:	910-672-1459
Email address:	tmreynolds@uncfsu.edu

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Rules and regulations governing the use of FSU email may be found at
<http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf>

II. Course Description: The new standards for all teacher education programs require knowledge, skills and dispositions needed by 21st century learners. The proposed course is designed to align the new standards with content knowledge in developing math and science; to make it more user friendly for 21st century teachers and learners. Emphasis is placed on the use of best practices that prompts integrative teaching and inquiry based learning which includes problem solving, reasoning, communication, connection, representation, debating issues involving science and technology from a global perspective.

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. Textbook:

Peters and Strout. Science in Elementary Education: Methods, Concepts and Inquiries, 11th ed. 2011. Pearson.

ISBN 13:978-0-13-503150-6 www.pearsonhighered.com

Evertson and Emmer. Classroom Management for Elementary Teachers, 8th ed. 2009. Pearson.

ISBN 13: 978-0-205-57862-7 www.personhighered.com

Wong and Wong. The First Days of School. 2009. Harry Wong Publications. ISBN 978-0-9764233-1-7

NC Essential Standards for science – hard-copy via online www.ncpublicschools.org

Common Core Standards for Math – hard-copy via online www.ncpublicschool.org

TASKSTREAM ACCOUNT - contact Dr. Kelly Charles to register and receive your code. (Paid by FSU)

IV Learning Outcomes

FSU School of Education Elementary Education Undergraduate Outcomes

- A. Teacher candidates will know their content based on the North Carolina Standard Course of Study, State Standards and CAEP.
- B. Teacher candidates will know how to teach based on the North Carolina Standard Course of Study, State Standards, and CAEP.
- C. Teacher candidates will implement practices that reflect the cognitive, mental, and physical development of P-6 students.
- D. Teacher candidates will know how to utilize technology to enhance instruction, learning, research, assessment, and data management.
- E. Teacher candidates will demonstrate leadership skills through the establishment of a safe, orderly, and positive environment.
- F. Teacher candidates will provide appropriate accommodations and implement teaching strategies for diverse learners.
- G. Teacher candidates will integrate 21st century knowledge and skills in instruction.
- H. Teacher candidates will be able to communicate effectively and be reflective practitioners.

Student Learning Outcomes for course—

Teachers (in-service and pre-service) completing the course will be able to:

- A. Students will demonstrate basic knowledge, and understanding of objectives appropriate to grades K-6 in both science and mathematics.
- B. Students will examine and create an integrated curriculum plan using backward mapping based on national standards and state outcomes (NCSCOS).

- C. Students will plan, design, and teach lessons using a prescribed lesson plan format which will include microteaching, demonstrations and be technology rich.
- D. Students will facilitate learning opportunities for elementary learners to solve scientific and mathematical problems by intuitive approaches (critical thinking, creative problem solving, problem-based learning, etc.).
- E. Students will plan for the learning needs of diverse learners.
- F. Students will use appropriate assessment methods to identify student learning needs.
- G. Students will use a variety of strategies, models and tools to design and implement multi-level events and activities.
- H. Students will research and apply appropriate models for teaching using an interdisciplinary approach.
- I. Students will understand of the FSU conceptual framework and the NCPTS and how they apply to the integration of math and science in the elementary school.
- J. Students will research and disaggregate information and data from a variety of sources to present the most recent developments in educational trends and issues with regards to integration, science and math studies in elementary school.

V. Standards

Conceptual Framework

The conceptual framework of the School of Education is reflected in this course and establishes a shared vision of its efforts in preparing educators to work effectively in P-12 schools. It defines the educator as a Facilitator of Learning, one who seeks to make the learning process accessible and one who enables learning to take place successfully. This presupposes that the educator is reflective and serves as a catalyst, stimulator, and motivator of the teaching for learning process. The conceptual framework defines the unit's vision which underscores the school's purpose for preparing its candidates for teaching and leadership roles in a global society. The unit prepares candidates who support student learning, within the context of family and community participation, for a diverse, technological, and global society. We achieve this vision through teaching, research, and service. Our conceptual framework serves as a lens through which we view our education professionals in elementary education program. The themes of our conceptual framework are: (1) caring dispositions and ethical responsibility; (2) communication; (3) knowledgeable and reflective educators; (4) research and leadership; (5) respect for diversity and individual worth; (6) technological competence and educational applications; and (7) working with families and communities.

National Science Teacher Standards

Twenty-first (21st) Century Teacher candidates have the knowledge and understanding of scientific inquiry, process skills, concepts and applications relative to the life, physical, and earth sciences.

Teacher candidates are knowledgeable in and are able to design and implement science learning activities that:

- a) Demonstrate appropriate safety practices and procedures to ensure the welfare and safety of all students and living organisms in the learning environment, including proper maintenance and disposal of materials.
- b) Use the unifying concepts and processes in the life, physical, and earth sciences.
- c) Involve the nature of science, the historical development of scientific thought, the process of scientific inquiry, and the reciprocal relationship between science and society
- d) Involve the application of science skills, equipment and processes, technological tools and mathematical knowledge and skills.
- e) Allow students to develop and apply content knowledge and critical thinking skills that lead to the development of scientific literacy.

National Standards for Teachers of Mathematics

Assessment of the teaching of mathematical concepts, procedures, and connections should provide evidence that the teacher

- demonstrates a sound knowledge of mathematical concepts and procedures;
- represents mathematics as a network of interconnected concepts and procedures;
- emphasizes connections between mathematics and other disciplines and connections to daily living;
- engages students in tasks that promote the understanding of mathematical concepts, procedures, and connections;
- engages students in mathematical discourse that extends their understanding of mathematical concepts, procedures, and connections.

Assessment of teaching mathematics as a process involving problem solving, reasoning, and communication should provide evidence that the teacher-

- models and emphasizes aspects of problem solving, including formulating and posing problems, solving problems using different strategies, verifying and interpreting results, and generalizing solutions;
- demonstrates and emphasizes the role of mathematical reasoning;
- models and emphasizes mathematical communication using written, oral, and visual forms;

- engages students in tasks that involve problem solving, reasoning, and communication;
- engages students in mathematical discourse that extends their understanding of problem solving and their capacity to reason and communicate mathematically.

Assessment of a teacher's fostering of students' mathematical dispositions should provide evidence that the teacher

- models a disposition to do mathematics;
- demonstrates the value of mathematics as a way of thinking and its application in other disciplines and in society;
- promotes students' confidence, flexibility, perseverance, curiosity, and inventiveness in doing mathematics through the use of appropriate tasks and by engaging students in mathematical discourse

Assessing the means by which a teacher assesses students' understanding of mathematics should provide evidence that the teacher

- uses a variety of assessment methods to determine students' understanding of mathematics;
- matches assessment methods with the developmental level, the mathematical maturity, and the cultural background of the student;
- aligns assessment methods with what is taught and how it is taught;
- analyzes individual students' understanding of, and disposition to do, mathematics so that information about their mathematical development can be provided to the students, their parents, and pertinent school personnel;
- bases instruction on information obtained from assessing students' understanding of, and disposition to do, mathematics.

Assessment of the teacher's ability to create a learning environment that fosters the development of each students' mathematical power should provide evidence that the teacher

- conveys the notion that mathematics is a subject to be explored and created both individually and in collaboration with others;
- respects students and their ideas and encourages curiosity and spontaneity;
- encourages students to draw and validate their own conclusions;
- selects tasks that allow students to construct new meaning by building on and extending their prior knowledge;
- makes appropriate use of available resources;
- respects and responds to students' diverse interests and linguistic, cultural, and socioeconomic backgrounds in designing mathematical tasks;
- affirms and encourages full participation and continued study of mathematics by all students.

<http://www.fayar.net/east/teacher.web/math/Standards/Previous/ProfStds/EvTeachM8.htm>

Dispositions

Dispositions will be addressed through readings, modeling, reflecting, field experiences, discussion and other approaches. This course will seek to enhance and strengthen the dispositions listed below.

Professional Competence		Professional Responsibilities	
X	Appreciates and engages in self-reflection	X	Dresses appropriately for the setting
X	Shows a commitment to ongoing learning	X	Is punctual
X	Desires to learn and apply new technologies	X	Attends class regularly and participates in the class
X	Is receptive to new ideas and feedback	X	Completes assignments and tasks in a timely manner
X	Writes and speaks clearly and effectively	X	Willing to go beyond required assignments
X	Uses culturally sensitive language when communicating with families	X	Shows initiative and motivation
	Respects the privacy of students and their families	x	Assumes fair share of responsibilities
Professional Dispositions and Qualities		Professional Integrity	
X	Believes all children can learn	X	Displays high and ethical professional standards
X	Understands the culture of students and their families	X	Is honest and dependable
X	Values and respects diversity and individual differences	X	Is courteous and respectful
X	Demonstrates flexibility and adaptability	X	Has a positive professional attitude
X	Treats all students fairly and equitably	X	Accepts and uses constructive criticism
X	Is sensitive to the feelings of others	X	Maintains emotional control
X	Interacts appropriately and positively with others		

NORTH CAROLINA PROFESSIONAL TEACHING STANDARDS

STANDARD I: TEACHERS DEMONSTRATE LEADERSHIP.

- 1.1 Teachers lead in their classrooms
- 1.2 Teachers demonstrate leadership in the school
- 1.3 Teachers leading the teaching profession.
- 1.4 Teachers advocate for schools and students
- 1.5 Teachers demonstrate high ethical standards

STANDARD II: TEACHERS ESTABLISH A RESPECTFUL ENVIRONMENT FOR A DIVERSE POPULATION OF STUDENTS.

- 2.1 Teachers provide an environment in which each child has a positive, nurturing relationship with caring adults.
- 2.2 Teachers embrace diversity in the school community and in the world.
- 2.3 Teachers treat students as individuals
- 2.4 Teachers adapt their teaching for the benefit of students with special needs.
- 2.5 Teachers work collaboratively with the families and significant adults in the lives of their student.

STANDARD III: TEACHERS KNOW THE CONTENT THEY TEACH.

- 3.1 Teachers align their instruction with the North Carolina Standard Course of Study.
- 3.2 Teachers know the content appropriate to their teaching specialty.
- 3.3 Teachers recognize the interconnectedness of content areas/disciplines.
- 3.4 Teachers make instruction relevant to students.

STANDARD IV: TEACHERS FACILITATE LEARNING FOR THEIR STUDENTS

- 4.1 Teachers know the ways in which learning takes place, and they know the appropriate levels of intellectual, physical, social, and emotional development of the students they teach.
- 4.2 Teachers plan instruction appropriate for their students.
- 4.3 Teachers use a variety of instructional methods.
- 4.4 Teachers integrate and utilize technology in their instruction
- 4.5 Teachers help students develop critical thinking and problem-solving skills.
- 4.6 Teachers help students work in teams and develop leadership qualities.
- 4.7 Teachers communicate effectively.
- 4.8 Teachers use a variety of methods to assess what each student has learned.

STANDARD V: TEACHERS REFLECT ON THEIR PRACTICE.

- 5.1 Teachers analyze student learning.
- 5.2 Teachers link professional growth to their professional goals.
- 5.3 Teachers function effectively in a complex, dynamic environment.

Content Competencies

Elementary grades teacher candidates have the knowledge and understanding of mathematical conventions and processes skills relative to: Number sense, numeration, numerical operations, and algebraic thinking; spatial sense, measurement and geometry; patterns, relationships, and functions; and data analysis, probability and statistics.

Areas of mathematical competency include:

- Problem solving, reasoning and proof, communication, connection, and representation.
- Number sense, numeration, and numerical operations
- Spatial sense, measurement and geometry
- Patterns, relationships, and functions and algebraic thinking
- Data analysis, probability and statistics
- Mathematical instructional strategies and tools

Elementary grades teacher candidates have the knowledge and understanding of scientific inquiry, process skills, concepts and applications relative to the life, physical, and earth sciences. The science competencies include:

- Demonstrate appropriate safety practices and procedures to ensure the welfare and safety of all students and living organisms in the learning environment, including proper maintenance and disposal of materials.
- Use the unifying concepts in the life, physical, and earth sciences.
- Involve the nature of science, the historical development of scientific thought, the process of scientific inquiry, and the reciprocal relationship between science and society.

- The application of scientific skills, equipment and processes, technological tools and mathematical knowledge and skills.
- Allow students to develop and apply content knowledge and critical thinking skills that lead to the development of scientific literacy.

Taxonomy of Significant Learning (FINK)	Dimensions of Learning (Marzano/Costa)	Domains of Learning Taxonomies (Bloom)	Assessment
Caring	Attitudes and Perceptions	Affective Domain	Writing Prompts Reflections
Foundational Knowledge	Acquire and Integrate Knowledge	Cognitive Domain (<i>Knowledge, Comprehension,</i>)	Quizzes, Model Presentations Teacher Observation
Application	Extend and Refine Knowledge	Cognitive Domain (Application, Analysis,) Psychomotor Domain (<i>Procedural Knowledge - use of technical, performance skills</i>)	Curriculum Design, Lesson Plans Teacher Observations Rubrics Model Presentations
Integration	Use Knowledge Meaningfully	Cognitive Domain (<i>Synthesis, Evaluation</i>)	Development of Unit plans Methods Fair Research Project

NCPTS addressed in this Course	FSU School of Education Conceptual Framework Themes	Elementary Education Undergraduate	Reading and Elementary Graduate	Demonstration/Assessment
Demonstrate leadership	2, 4,7	E	G	Engage in meaningful discussion of concepts and ideas associated with the inclass prompts with instructor monitoring
Engage in and make sure they meet the needs of students through inclusion and other models of effective practice	3,5	C,F	D,B	Lesson plans, discussions Use of rubric for evaluation
Align their instruction with NC SCOS	1, 3, ,6	A,B	B	Standard /Practices Matrix completion/instructional planning sessions and unit plans Evaluated with rubric
Know the content they teach	3	A	A	Quizzes, Project rubrics, Content Project. Evaluated with rubric
Use a variety of methods to assess what each student has learned	3, 6	B,C,D,G	B,D,C	Lesson plans and presentations – using rubrics to assess
Reflect on their practice	3, 4	H	E	Essays and writing prompts discussions Instructor monitoring

Technology

Candidates will use a variety of technologies to enhance their knowledge of technology in this course. Some technologies for this course may include: productivity tool (Power Point, presentation software), Internet, web page construction, e-mail, on-line course applications, grade book, video camera.

VI. Course Requirements and Evaluation Criteria –

- a. **Grading Scale** – The class grading scale must be consistent with the university catalog.

100 – 92 %	A	470-432
91 – 83 %	B	431 - 390 pts
82 - 73 %	C	389 – 343 pts
72 - 65 %	D	342– 305 pts – <i>course repeated by teacher licensure candidates</i>
64 – 00%	F	304 points or less

- b. **Attendance Requirements** – Students are expected to attend all class meetings, and other instructional sessions. Students are also expected to arrive to class on time and remain in class for the entire scheduled period. When students must miss class (es) for unavoidable reasons, i.e., illness, family emergencies, or participation in official university sponsored activities – they are responsible for informing faculty of the reasons for the absences, in advance if possible, and completing all missed assignments. The use cell phones or texting is not allowed when class is in progress. Disruptions due to electronic devices will result in loss of points or request to leave the class. **Class attendance is extremely important and greatly impacts your final grade.** Much of the content required for this class will receive its foundation through class presentations and interactive activities. Your participation in all classes will allow you to develop a comprehensive understanding of course competencies. You cannot participate if you are absent. Therefore, students who miss more than two classes are not qualified for an “A” grade. Students who miss more than three classes are ineligible for a “B” grade. **For your information**, an education major earning a “D” in an education course is required to repeat the course.

- c. **Graded Assignments**

1. Unit plan concept map
- 2. Two textbook tests – essay**
- 3. Unit Plan**
4. Curriculum map
5. Resource list/ make and take activities list
- 6. Research Paper /multimedia presentation - TASKSTREAM**
7. Model Lesson - Children’s literature -Math and Science Integrated -
- 8. Lesson analysis – Midterm exam**
9. PDA
10. School Practicum
11. Final Exam – presentation
12. Fibonacci Learning Center
13. Higher Order Thinking Activities – Learning Center
14. Inquiry presentation - textbook
15. Participation/attendance
16. Classroom Management Modules

- d. **Value of Each Assignment**

Number	Individual Assignment	Points
1	Unit plan concept map	5
4	Research Project (this will go on Taskstream for your licensure process)	70
5	Textbook Quiz # 1 online	20
6	Unit plan	40
7	Textbook quiz # 2 Online	15
8	Inquiry presentation	40
9	Classroom Management Modules - online @ 10 pts per module and 50 points for notebook	100
10	Midterm Exam	20
11	School Practicum Packets (Field Experience)	30
12	PDA	10
13	Class participation /attendance - up to 1 points per hour – each session= up to 4pts	60

14	Final Exam – Presentation	30
	TOTAL FOR INDIVIDUAL	350
Group Assignments		
1	Curriculum Map 4 per person and 16 for team (includes presentation points)	20
2	Resource List/Make and Take Activities (30/20) as electronic document placed on Discussion Board	20
3	Fibonacci Numbers Learning Center	20
5	Children’s Science and Math and Literature Presentation	20
6	Higher Order Thinking Activities - critical thinking, creative thinking, moral dilemma - LAP	20
7	Debate/discussion (Socratic Method)	20
	TOTAL for GROUP	120
	Total for Course	470

- e. **Policy on Missed or Late Assignments:** Missed assignments will result in a total point reduction for the assignment grade (0). Late assignments will result in 10% loss in points available per day late. Assignments will not be accepted via email - upon permission of the instructor, late assignments may be submitted via blackboard drop-box.

VII. Academic Support Resources

Course participants who experience difficulties in meeting the course expectations should schedule an appointment with the instructor to determine viable strategies that will meet their academic needs.

VIII. Course Outline and Assignment Schedule

Week	Session	In class	Out of Class	Due
January 12	1	Welcome/ House Keeping Syllabus Conceptual Framework / Bloom ball Lesson plan (In teams - Complete a science lesson plan (k-1, 2-3, 4-5) – /share) Rubrics BlackBoard RESEARCH TOPICS	Design a Bloom Ball using	
January 19	2	Math and Science The Nature of Science Inquiry??? Concept maps Types of instructional planning 1. Thematic units 2. Interdisciplinary units	Read Chapters 1-3 Choose unit plan	
January 26	3	Discuss unit plan Differentiation/scaffolding Vocabulary Inquiry 1,2, 3	Write one lesson plan from chosen unit topic	
February 2	4	Learning Center Learning Activity Package Inquiry 4,5,6	Fibonacci Numbers	Unit plan concept map
February 9	5	Socratic Seminar Inquiry 7,8,9	Plan for Seminar	
February 16	6	Seminar Inquiry 10,11		Module 6 and 7 Seminar
February 23	7	Fibonacci Numbers presentation by team	Work on research paper	Module 8 and 9

March 1		Midterm Exam	online	Midterm Exam Due Research paper /PowerPoint Initial posting to taskstream March 5
March 8	8	SPRING BREAK		
March 15	9	Creative Thinking Critical thinking Moral Dilemma		Unit Plan Due Module 10
March 22	10	TEAM PLANNING		
March 29	11	Team LC presentations		Presentations
April 5	12	Team LC presentations		Research paper /PowerPoint revisions complete on taskstream Due April 5 Presentations
April 12	13	Presentations Children's Literature		Resource booklet -
April 19	14	Presentations Children's Literature		Field Experience Reports PDA Presentations
April 26	15	School of Education Pinning Ceremony		
May 1/3	16	Final Exam		



JUST A LITTLE NOTE: *All presentations and plans should be technology rich and student/technology interactive. All units and plans should include the appropriate method of assessing student learning – formal and informal, formative and summative.*

GENERAL COURSE REQUIREMENT EXPLANATION

A. School Practicum

All elementary methods courses require a one-day per week practicum in an assigned partnership school. As part of this course you are required to spend an entire school day each week in your assigned partnership classroom. A minimum of twelve visits is required. **Failure to complete the practicum will result in the student failing the course.** A list of practicum assignments are linked to your partnership school experience (refer to the table below). The methods professor will provide an attendance log to document your school visits. Practicing teachers may use the school where they are employed to complete their practicum assignments.

Observation	ASSIGNMENT
Part I	<ul style="list-style-type: none"> ○ Observe and discuss with grade level teachers how science and math is currently taught in each grade level at your school ○ Peruse current science texts, materials used in each grade level. Write a one page essay describing what you see. What are the publication dates? Do you think they are current with new discoveries, ideas and concepts in science and technology? ○ Review data from the Math and Science Assessments at your school – what are the major areas of concern regarding students understanding of math and of science

	concepts? Explain
Part II	<ul style="list-style-type: none"> ○ Observe the class and discuss the concept of constructivism in the areas of math and science. Does the teacher(s) use this method? Explain how. How is the ZPD theory implemented and how is science learning differentiated for diverse learners? ○ How would you use the idea of constructivism to increase student understanding of related math and science concepts presented during your observations. How would you link the concepts from each curriculum area? ○ What strategies and learning opportunities do you see as missing links to student achievement and motivation to learn math and science at an early age. ○ What attitudes and perceptions regarding the teaching of science in elementary school do you perceive in this practicum experience? What about math? What about the idea of integrating the two areas?
Part III	<ul style="list-style-type: none"> ○ Look for school and departmental curriculum guides (pacing) for the areas of science and math – view from each grade level: <ul style="list-style-type: none"> ○ Do you find clear connections and links between math and science? ○ Are there any connections to reading/writing in the content area and links to literature? ○ Sit in on grade level meetings: <ul style="list-style-type: none"> ○ What methods are used to plan for math/science? Observe one planning session from each area - k-2, 3-4 and 5-6. ○ Is there any evidence of critical thinking/creative thinking approaches? ○ What seems to be the primary means of facilitating learning in each of the grade levels. ○ Based on our class activities thus far, write a reflection about the discrepancies or commonalities between your observations and our discussions. <ul style="list-style-type: none"> ○ What are your suggestions and ideas for teaching science in the elementary school (given you will have no other resources than those currently available to teachers)?
Part IV	<ul style="list-style-type: none"> ○ How does the inquiry method of teaching fit with the instructional models used in this classroom? How would you change the instructional plans to incorporate problem based, inquiry based models for presenting and connecting math, science and language arts standards? ○ Write a reflection of the greatest AHA's you have experienced in the methods and approaches currently used to integrate math and science. ○ What would you suggest for improvement of instruction connecting the standards of math and science.
Part V	<ul style="list-style-type: none"> ○ Work with your cooperating teacher to present a science lesson that integrates math - Use your textbook and any other ideas in class for that presentation. Write a reflection. Provide a copy of the lesson plan you used.

B. Professional Development Activities

Additionally, as a part of your methods instruction you are required to attend a **minimum of five professional development activities**. You will need to present proof of attendance at the end of the semester. Students who fail to attend five professional development activities are not eligible for the “A” grade. Students who fail to attend a minimum of four professional development activities are not eligible for the “B” grade. Students attending three or fewer professional development activities are ineligible for the “C” grade. For your information, an education major earning a grade that is lower than a “C” grade in an education course is required to repeat the course. Listings of professional development workshops, field trips, and conferences available to you are posted on the bulletin board outside of BU 342.

C. Research paper /project

Using the APA format, each person will prepare a research paper regarding a current issues and a multi-media presentation. This paper will serve as the content project evidence for your licensure. You cannot pass this course without successfully completing this project. There are guiding documents provided on Blackboard that clearly defines the evaluation rubric and the requirements for that project. Your deadlines are not changeable – they are set for all pre-service teachers by the School of Education. You must make a level three on every level of the rubric to meet licensure requirements.

E. INTEGRATED CURRICULUM MAP

Using the websites above, students will demonstrate an understanding of curriculum mapping and backward design. Each group will create and present a curriculum map interconnecting both math and science.

F. CHILDREN'S LITERATURE PRESENTATION – Reading across the Curriculum

Each group will present a grade appropriate book to the class that illustrates logical reasoning, scientific inquiry and mathematical concepts imbedded in the story. You will design a unit of study using this book as a catalyst. Your peers will role-play your “students” as present the story and one lesson associated with the unit. You may bring manipulatives and other materials that might enhance your presentation. Check with the other working groups so there will be no duplication of books. In addition, your group will need to provide a one-page explanation of the book to share with your peers.

G. Integrated Unit Plan -

Following a visit to a local museum/learning center, your group will design an interdisciplinary, integrated unit plan based on one of the unifying concepts of the math and science curriculum. This unit should include the “field trip” experience, a learning center and a learning activity package for differentiation. These should be multiple lessons and multiple assessments. It should be presented in a “module container” that is inviting to the intended audience. Parts of this unit could be used as the basis for your Culminating Project - The Interdisciplinary Fair.

- 1. Unit Plan**
- 2. Learning Center**
- 3. Learning Activity Package**
- 4. Reflection**

Activities for differentiation should be included in the integrated unit plan. The instructor will provide a simple heuristic. The presentation of these two activities will be presented in carousel fashion during class time. Each group should design a single learning center integrating math and science, set up the center for the presentation and have one learning activity package for each group member. The learning activity package should lead the students through the entire taxonomy of the cognitive domain and include activities aimed at increasing learner development within the affective and psychomotor domains.

G. List and synopsis of resources for classroom strategies and methods for teaching science and math in the elementary classroom

After reviewing the North Carolina Standard Course of Study for your grade level, your group will present to the class five ideas you have developed to enhance the integration of the science and math curricula. These ideas must be different (games, bulletin boards, cooperative learning lessons, etc.) and should include the title, strand, competency goals, and objective it supports from the North Carolina Standard Course of Study. Groups should prepare copies of each idea for distribution to your peers and the instructors.

H. Discussion/Debate

Serve on a team that debates/discusses a controversial topic in the areas of science and math. You will “be the student team” Using the Socratic Method for the discussion and the Model UN framework for Debate your team will prepare and lead the assigned activity during the class session.

<http://www.unausa.org/flowofdebatechart>

<http://www.wcs.edu/fhs/StaffDevelopment/socraticseminars.htm>

<http://www.nwabr.org/education/pdfs/PRIMER/PrimerPieces/RubricsAssess.pdf>

F. Assessments

- Assessments for this course are administered through the Blackboard Learning System on specified dates. Tests are made available according to schedule that follows. Students may access the tests only on the designated dates beginning @ 5:00 PM on the first date and ending @ 11:55 PM on the final date. Make plans to take your tests during the assigned time.
- The mid-term exam will be a critical analysis of effective instructional planning. Documents and instructions will be provided by the instructor.
- Rubrics will be used for model presentations and instructional plan. The FSU School of Education rubric will be used for the Unit Plan Portfolio. This will provide students practice before posting to TaskStream. Students will follow the lesson plan format provided by the instructor.
- A presentation rubric will be used to assess the presentation by students. Students may also be asked to video this performance and do a self assessment and reflection.
- The FSU School of Education Rubric will be used for the Content Project (research paper). This is an extremely important document. You will not pass this course without this document nor will you be able to receive your license without a passing score using this rubric.

IX. Teaching Strategies :

This course will involve lectures/demonstrations, student discussions, simulated teaching experiences, cooperative learning groups, and computer experiences. (e.g., large and small group activities, individual and group projects, demonstrations, discussions, role play, and Internet research) May also include:






















- Large and small group activities
- Individual and group presentations
- Practicum assignments
- Interactive lectures
- Demonstration lessons/simulations
- Role-play,
- Case studies
- Internet research
- Reflective writing
- Formative and summative assessments
- Debate/Discussion (Formal and Informal)
- Guest Scholars

X. Bibliography

- Albert B. Mathematics for elementary teachers: a conceptual approach. 5th ed. Boston: McGraw-Hill, c2001.
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PERIODICALS

-  Arithmetic Teacher
-  Exceptional Children
-  The Gifted Child Today
-  The Journal of Computers in Mathematics and Science
-  Teaching
-  Journal of Learning Disabilities
-  Journal for Research in Mathematics Education
-  Mathematics Teacher
-  New Directions for Teaching and Learning
-  Teaching Exceptional Children
-  Current Index of Journals of Education (CIJE)
-  Educational Resources Information Center (ERIC)
-  Mathematical Reviews
-  Mathematics and Computer Education
-  Mathematics of Operations Research
-  Science and Education
-  Science Activities: Classroom projects and Curriculum Ideas
-  Science and Children
-  Science Education
-  Science Educator
-  Science Teacher

Pertinent Web Resources

- <http://www.ncpublicschools.org/curriculum/mathematics/scos/2003/k-8/index>
- <http://www.ncpublicschools.org/curriculum/mathematics/elementary/>
- <http://www.mcrel.org/compendium/SubjectTopics.asp?SubjectID=1>
- http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf
- http://www.corestandards.org/assets/CCSSI_Mathematics_Appendix_A.pdf
- <http://www.corestandards.org/the-standards>
- <http://www.mcrel.org>
- <http://www.nrel.org>
- <http://www.serve.org>
- <http://www.sarasota.k12.fl.us/g2k/69.htm>
- <http://www.nwlink.com/~donclark/hrd/bloom.html>
- <http://www.mcrel.org/dimensions/whathow.asp> - Dimensions of Learning
- <http://www.abcte.org/teach/exam-preparation/multiple-subject/standards>
- <http://www.ncpublicschools.org/curriculum/science/scos/2004/>
- http://www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf
- <http://www.educationworld.com/standards/state/toc/index.shtml#science>
- <http://www.mcrel.org/compendium/SubjectTopics.asp?SubjectID=2>

Elementary Level Competencies PURPOSE

The science component of the North Carolina *Standard Course of Study (SCS)* is designed to provide learning opportunities for all students to become scientifically literate. Scientific literacy implies an understanding of the scientific concepts and processes needed for personal decision making, participation in civic affairs, and economic productivity. A scientifically literate person has a substantial understanding of scientific concepts and inquiry skills, which enable one to continue to learn and think logically. This person understands and appreciates the limits of science and technology. North Carolina students can achieve scientific literacy through an instructional program based on the science component of the *SCS*. The intent of the science program is to merge unifying concepts of science, strands, content goals, and objectives.

Elementary Education

The elementary science section of the *SCS* integrates the unifying concepts of science to provide continuity in science instruction across grade levels and between science disciplines. These unifying concepts are:

- Systems, Order and Organization.
- Evidence, Models, and Explanation.
- Constancy, Change, and Measurement.
- Evolution and Equilibrium.
- Form and Function.

The elementary science section of the *SCS* has **four strands** that provide the context for teaching the goals and objectives. The strands include:

- Nature of Science.
- Science as Inquiry.
- Science and Technology.
- Science in Social and Personal Perspectives.

By the end of fifth grade, all students should have developed an understanding of the following:

- Characteristics of organisms.
- Similarities and differences in organisms.
- Life cycles of organisms.
- Organisms and environments.
- Ecosystems.
- Properties of earth materials.
- Weather concepts.
- Objects in the sky.
- Changes in earth and sky.
- Properties of objects and materials.
- Position and motion of objects.
- Electricity, magnetism and sound.

Standards of Mathematics for Grades K-6

Mathematics as:

- Problem Solving
- Communication
- Reasoning
- Mathematical Connections
- Number Sense and Numeration
- Number Relationships
- Concepts of Whole Number Operations, Systems and Theory
- Whole Number Computation and Estimation
- Geometry and Spatial Sense
- Measurement
- Statistics and Probability
- Fractions and Decimals
- Patterns and Relationships
- Algebraic Thinking
- Probability

FSU Policy on Disruptive Behavior in the Classroom (Optional)

The *Code of the University of North Carolina* (of which FSU is a constituent institution) and the *FSU Code of Student Conduct* affirm that all students have the right to receive instruction without interference from other students who disrupt classes.

FSU Core Curriculum Learning Outcome under Ethics and Civic Engagement (6.03): All students will “prepare themselves for responsible citizenship by fulfilling roles and responsibilities associated with membership in various organizations.” Each classroom is a mini-community. Students learn and demonstrate responsible citizenship by abiding by the rules of classroom behavior and respecting the rights all members of the class.

The FSU Policy on Disruptive Behavior (see FSU website for complete policy) identifies the following behaviors as disruptive:

1. Failure to respect the rights of other students to express their viewpoints by behaviors such as repeatedly interrupting others while they speak, using profanity and/or disrespectful names or labels for others, ridiculing others for their viewpoints, and other similar behaviors;
2. Excessive talking to other students while the faculty member or other students are presenting information or expressing their viewpoints.
3. Use of cell phones and other electronic devices
4. Overt inattentiveness (sleeping, reading newspapers)
5. Eating in class (except as permitted by the faculty member)
6. Threats or statements that jeopardize the safety of the student and others
7. Failure to follow reasonable requests of faculty members
8. Entering class late or leaving class early on regular basis
9. Others as specified by the instructor.

The instructor may take the following actions in response to disruptive behavior. Students should recognize that refusing to comply with reasonable requests from the faculty member is another incidence of disruptive behavior.

1. Direct student to cease disruptive behavior.
2. Direct student to change seating locations.
3. Require student to have individual conference with faculty member. At his meeting the faculty member will explain the consequences of continued disruptive behavior.
4. Dismiss class for the remainder of the period. (Must be reported to department chair.)
5. Lower the student’s final exam by a maximum of one-letter grade.
6. File a complaint with the Dean of Students for more severe disciplinary action.

Students who believe the faculty member has unfairly applied the policy to them may make an appeal with the faculty member’s department chair.