**Auburn University Course Syllabus**

**Summer 2011**

**Course Number:** CTEC 3020

**Course Title:**  Primary Math and Science

**Course Time: TR 12:30 – 2:20 pm**

**Credit Hours:** 3 semester hours

**Prerequisites:**  Admission to Early Childhood Teacher Education

**Co-requisites:**  None

Instructor: Dr. L. Octavia Tripp

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Office Hours By Appointment

**Required Text:**

Charlesworth, R., & Lind, K. (2010). *Math and Science for Young Children* (Sixth ed.). Belmont, CA:

Wadsworth/Cengage learning.

**Recommended but not required:**

Kamii, C. (2000). Young Children Reinvent Arithmetic; Implications of Piaget’s Theory. New York, NY: Teacher College Press. (ISBN: 9780807739044)

**Materials**

1. Small Writing Journal for “*Science and Math is everywhere and everything we do*”.
2. Survival kit: scissors, ruler, tape, camera, CD or DVD, colored pencils or crayons and any materials needed to complete science centers and family involvement project.

***Instructor Statement – The instructor of this course has the right to change, modify, add additional lessons and revise this syllabus to provide enhancement to course. Sometimes it becomes necessary for changes in the outline of the course. The instructor will notify students of the necessary changes and revisions.***

**COURSE DESCRIPTION**

This course is to provide pre-service teachers opportunities to be more knowledgeable and practical in early childhood (Pre-K, K-3rd grade) curriculum and instruction in the areas of mathematics and science. Pre-service teachers will have a better understanding of children’s learning and development, curriculum development, and instructional methods. Based on their understanding of early learning standards as well as aforementioned areas, pre-service teachers will apply their knowledge to designing, implementing, and evaluating the interdisciplinary curriculum. In addition, through hands-on activities and teaching demonstrations, they will also develop effective teaching strategies working with young children that can be used in their future classrooms.

**COURSE objectives**

Upon completion of the course, students will be able to:

1. Identify important mathematics /science content, process skills, and attitudes appropriate to young children. (NAEYC Standard 1b, 4a, 4b, 4c, & 4d)
2. Become acquainted with the principles and elements of curriculum development (e.g., goal setting, planning, implementing, and assessing curriculum) in mathematics and science. (NAEYC Standard 1a, 1b, 1c, 4b, 4c & 4d)
3. Develop an understanding that early childhood curriculum is an integrated curriculum, and that children’s learning in mathematics and science takes place in integrated learning experiences with concrete materials in a variety of contexts. (NAEYC Standard 4c)
4. Acknowledge the unique needs (e.g., physical, social, intellectual, linguistic, and cultural) of all children and the need to work with their families. (NAEYC Standards 1a, 1b, 1c, 3b, 3c, 3d, 4b, 4d, 5b, 5c, & 5e)
5. Design, implement, and evaluate developmentally appropriate curricular content, strategies, and instructional materials, and reflect on their performance. (NAEYC Standards 1a, 1b, 1c, 4b, 4c, & 4d)
6. Understand how to record, report, and evaluate development level of young children through naturalistic/performance-based assessment and utilize developmentally appropriate assessment and reporting techniques. (NAEYC Standards 3a, 3b, & 3c)

**USEFUL WEBSITES**

National Association for the Education of Young Children: <http://www.naeyc.org>

National Council of Teachers of Mathematics (NCTM): [http://www.nctm.org](http://www.nctm.org/)

National Science Teachers Association (NSTA): <http://www.nsta.org>

Council for Exceptional Children (The Division for Early Childhood): <http://www.cec.sped.org>

Alabama Math, Science, and Technology Initiative: <http://www.amsti.org>

Montessori Program: [http://www.montessori.org](http://www.Montessori.org)

High Scope Program: <http://www.highscope.org>

Bank Street Approach: <http://www.bnkst.edu>

Project Approach: <http://www.projectapproach.org> or <http://illinoispip.org>

Waldorf approach: [http://www.awsna.org](http://www.awsna.org/)

Reggio Emilia Approach: http://www.reggioemiliaapproach.net

 **Auburn College of EDUCATION-CONCEPTUAL FRAMEWORK**

Competent

Competent professionals demonstrate the knowledge and skills needed to facilitate the learning of the individuals they serve. Their competence enables them to model and promote active, collaborative, and ongoing learning. Their efforts are enhanced by their abilities to foster learning communities that are safe, stimulating, and enriched with diversity; engage in reasoned and purposeful decision making; and implement their professional practices in proactive, flexible, and self-regulating ways.

We recognize that the development of professional competence is linked to levels of preparation and experience. We also acknowledge that competence continues to develop over the course of an entire career.

Committed

Committed professionals make reasoned decisions based on thoughtfully constructed values. As a College, we strive to nurture values that support the learning of all people, honor diversity, protect the integrity of learning, and expand the scholarship of our professions. We view these values as professional dispositions, and we define them as filters for responsible decision-making. Our College emphasizes the conscious development of commitments related to professional responsibilities and ethics, collaboration, diversity, and intellectual vitality.

Reflective

We choose to frame reflection as a critical and pervasive habit of mind that permeates and fuels the ongoing expansion of competence and the continued development of reasoned commitments. Reflective professionals subject their own competencies and commitments to continuous scrutiny as they systematically monitor the impact of their professional practices on the individuals they serve and make adjustments as needed. Thoughtful reflection emphasizes reviewing and analyzing past practices in ways that influence and improve future practices. This stance inspires self-initiated professional growth and results in increased capacities for addressing the complexities and dilemmas situated within the work of educational and human services professionals.

**EVALUATION PROCEDURES**

 Student achievement of course goals and objectives will be evaluated through the following:

□ Participation in class activities

□ Developed lesson plans and integrated unit plan (with considerations for student diversity)

□ Demonstration of teaching (with adaptations for students’ diverse needs)

□ Completion of assignments and exam/quizzes and projects that allow for student understanding of teaching early learners math and science.

**COURSE REQUIREMENTS**

Specific criteria in rubric format will be discussed as due date approaches for items 1-5.

**1. Software Critique (10 points):** Carefully designed classroom environment including educational software can function as an effective teaching and learning tool (NAEYC Standard 1b) if properly designed and used. Teacher candidates should be able to select developmentally appropriate software and use it effectively (NAEYC Standard 4b).

The best way to evaluate software is to observe students using it. Observing students, however, does not tell you everything about the software. Even some games and tutorials can work better with an appropriate plan from the teacher. If students are simply thrown in front of the software, they might not learn as much as they would if the software was used as part of an integrated lesson. Therefore, it is important to not only think about the software itself, but how the software will be used. The critique format will be provided in class. All questions should be answered and a numerical score computed.

**2. Science Center Design (25 points):** Design a center that might be set up in a classroom to reinforce one of the science concepts noted in textbook and class (NAEYC Standard 1a & 1b). Implement the various procedures discussed in class (NAEYC Standard 4). The center can be displayed on a table or mounted on a tri-fold, stand-up cardboard sheet. Include center title, directions, materials, and checking or self-checking procedures.

**3. Family Involvement Project (20 points):** Describe an activity (to reinforce a math/science concept), which would be done at home by individual students (Pre-K, K-3rd grade) and their families (e.g., birthdates of everyone in the family – aunt, uncle, cousins – to see which month is most common). Be creative in involving the family. Prepare a packet (e.g., an instruction to students, a letter to families with instruction) to be sent home.

**4. Single Lesson Plan Reflecting the Integration of Literacy, Science, and Math (30 Points):** Develop a lesson plan for science that includes a children’s book to engage and a math activity to extend the lesson. Use the Five E Model for Inquiry Based Learning that will be modeled in class: Engage, Explore, Explain, Extend, Evaluate.

**5. Mathematics Lesson Plan (25 points):** Develop a lesson plan for mathematics reflecting one of the content standards of the NCTM. One or more NCTM process standards must be incorporated as well as a means for evaluating the lesson.

**6. Participation (10 points):** All students are required to be active participants in class discussions and activities. Attend all classes and be punctual. The participation points will be earned by in-class, active engagement in all activities (including discussions and presentations). 5 points will be deducted for each absence. The only excused absence is medical and official documentation is required. Three unexcused absences could result in a teacher candidate being dropped from the program.

**6. Quizzes (40 points) /Exam (50 points)** Quizzes are given throughout the course over material discussed in the class and reading. There will be approximately 4-5. A midterm and final will be administered with the mid term equaling 15 points and the final 25 points. (While the instructor plans to adhere to this the midterm or final may be cancelled in the lieu of a project)

**7. Photo voice (15 points)** Students will use cameras to address issues from their point of view. Students will use their images and voice to reflect the world around them and make the observation that science and math is everywhere and in everything we do by writing narratives that describe their photos.

**8. Journal Critiques (25 points)** Students will be given a critique format to use in reviewing and writing reflections of journal articles (5). These articles provide science and math integration of lessons that teachers use in their daily classroom to excite and introduce inquiry and discovery to primary students.

**9. Philosophy Statement (Mathematics and Science) Teaching (10 points)** The Statement is a one- to two-page document that provides a clear, concise account of your teaching approach, methods, and expertise. Each statement should be unique. Nonetheless, the following guidelines should be helpful to you as you prepare your statement. A Teaching Philosophy Statement should answer four fundamental questions: **1) Why do you teach? 2) What do you teach? 3) How do you teach? 4) How do you measure your effectiveness?**

**GRADES**

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| --- | --- |
|  Requirements and Points | Grades |
| * Software Critique (15 points)
* Family Involvement Project (30 points)
* Science Center Design (25 points)
* Integrated Single Lesson Plan (30 points)
* Mathematics Lesson Plan (25 points)
* Class Participation(15 points)
* Quizzes (70 points)
* Photo voice (20 points)
* Journal Critiques (50 points)
* Philosophy Statement (Mathematics and Science) Teaching (20 points)

 Total = 300 Points | A = 281-200 pointsB = 261-280 points C = 241-260 pointsD = 221-240 pointsF = 0-220 points |

**Class Policy Statements**

Participation: Students are expected to participate in all class discussions and participate in all exercises. It is the student’s responsibility to contact the instructor if assignment deadlines are not met. Students are responsible for initiating arrangements for missed work.

Attendance/Absences: Attendance is required at each class meeting. If an exam is missed, a make-up exam will be given only for University-approved excuses as outlined in the Tiger Cub. Arrangement to take the make-up exam must be made in advance. Students who miss an exam because of illness need a doctor’s statement for verification of sickness and should clear the absence with the instructor the day they return to class. Other unavoidable absences from campus must be documented and cleared with the instructor in advance. **Each unexcused absence** will result in 3 points deducted from the class participation grade. **Tardy arrivals** will result in 1 point deducted from the class participation grade. If points from absences and tardy arrivals exceed the 10 points allotted for class participation, the points will be taken from the final total. Three unexcused absences could result in a teacher candidate being dropped from the program.

Accommodations: Students who need special accommodations in class, as provided for by the American Disabilities Act, should arrange a confidential meeting with the instructor during office hours the first week of classes - or as soon as possible if accommodations are needed immediately. You must bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have these forms but need accommodations, make an appointment with the Program for Students with Disabilities, 1244 Haley Center; phone - 334 844-2096.

Honesty Code: The University Academic Honesty Code and the Tiger Cub Rules and Regulations pertaining to Cheating will apply to this class.

Professionalism: As faculty, staff, and students interact in professional settings, we are expected to demonstrate professional behaviors as defined in the College’s conceptual framework. These professional commitments or dispositions are: a) Engage in responsible and ethical professional practices, b) Contribute to collaborative learning communities, c) Demonstrate a commitment to diversity, and d) Model and nurture intellectual vitality.

\*Cell Phone Policy: Cell phone use or text messaging during the class session is viewed as extremely unprofessional and will results in an automatic loss of 5 points of **Class Participation and Professional Behavior grade points** (under COURSE REQUIREMENTS) **for each occurrence**. It is best that cell phones not be visible during the class session to avoid any misunderstanding of their use.

**Schedule of assignments and Discussion**

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| **Dates** | **Topic**  | **Reading/ Assignments**  |
| 5/19 | Course Introduction; Community Building Activities (How Do You Describe a Peanut?)  |  Write a **Science and Math autobiography** due May 24, 2011,  |
| 5/24 | Overview of NAEYC Standards, NCTM Principles and Standards with Focus on Data Analysis and Probability, Reading Discussion |  Assignment: **Journal Critique I**Units 2 and 3  |
| 5/26 | Reading Discussion of Unit 2 and 3Overview of NSTA Standards, Science Process Skills, Types of Scientific Inquiry | Assignment: Unit 4, 5, and 6 |
| 5/316/2 |  In-depth Discussion of 5E lesson model; Reading Discussion Unit 4, 5, and 6 | Assignment: Units 7 and 16  |
| 6/2 | Software Discussion and reading discussion of unit 7 and 16 | Assignment: **Software Critique**Unit 21 and 26 |
| 6/7 | Reading discussion unit 21 and 26In class group lesson plan using the 5 E model | Assignment: Locate and Print Alabama Course of Study Standards for Science and Math, Grades K-2. Unit 33 and 34. **Howard Gardner Multiple Test**  |
| 6/9 | Reading Discussion unit 33 and 34 Interpretation of ALCOSRocketry Activity |  Assignment: **Journal Critique II** |
| 6/14 | Chemical Test (AMSTI) | Assignment: Science Lesson PlanUnit 35 and 36 |
| 6/16 | Chemical Tests (AMSTI), Science Center DesignGroup Critique I Reading discussion unit 35 and 36 |  Assignment: **Philosophy Statement**Unit 37 and 38 |
| 6/21 | Reading Discussion Unit 35-38Math Activity | Assignment: Unit 8 and 9 |
| 6/23 |  Reading Discussion Units 8 and 9 | Assignment: Unit 10, 11, and 12**Journal Critique III** |
| 6/28 | Reading discussion Unit 10Science Activity | Assignment: Units 11 and 12 |
| 6/30 |  Reading Discussion unit 11 and 12MM Math Group Critique II | Assignment: **Math Lesson plan**Units 13-15 |
| 7/5 | Reading discussion 13 and 15 | Assignment: Unit 17 and 18**Integrated Lesson Plans Due** |
| 7/7 | Reading Discussion Unit 17 and 18 | Assignment: **Journal Critique III**Unit 19, 20  |
| 7/12 | Reading Discussion Unit 19 and 20  | Assignment: Unit 23-25 |
| 7/14 | Reading Discussion Unit 23-25 | Assignment: Unit 27-31**Journal Critique IV** |
| 7/19 | **Science Center Design Due** | Assignment: Unit 22, 32,  |
| 7/21 | Reading Discussion Unit 22 and 32  |  Assignment: 39-41**Journal Critique V**  |
| 7/26 | **Photovoice Due**Reading discussion 39-41 |  |
| 7/28 |  “Science & Math is everywhere and in everything we do” | **Final: Family Involvement Project**  |