



Syllabus



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EDU 600: Math and Science in Early Childhood Education

credits: 4 CRN# 40175

Summer Term 2008, July 12th - September 5th

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Course Description

This course focuses on the cognitive development of children birth to age 8 with emphasis upon the development and interrelatedness of math and science concepts. Using a hands-on approach, learners explore the various materials used in learning centers to stimulate and develop children's logico-mathematical thinking. Learners identify the various developmental levels of children's thinking and create developmentally appropriate materials and settings.

The course emphasizes the application of developmental principles to investigate and devise experiences that employ mathematical reasoning and scientific processes.

Prerequisites

SOSC 508 Child Development and MATH 502 Introduction to College Math or other college level math

Blackboard Orientations

If you have never taken an Online Interactive Course (OIC) at the college, we highly recommend that you attend one of the [2-hour Blackboard Orientation sessions](#) available throughout the state. If you choose not to attend a face-to-face session, you are encouraged to view our new [Online Orientation with audio](#) at your own convenience.

Required Resources

Textbooks:

Chaille, C., Britain, L. (2003). **The Young Child as Scientist: A Constructivist Approach to Early Childhood Science Education**. ISBN 0-205-36776-3.

Copley, J. (2000). **The Young Child and Mathematics**. ISBN 0-935989-97-8.

The textbook is available online at MBS Direct at: <http://bookstore.mbsdirect.net/gsc.htm> (The course-CRN number for ordering this textbook is: 40175). Textbooks can also be purchased from MBS via phone, mail or fax. For additional information, visit the [Online Bookstore](#) section of the college web site.

Online articles: Will be provided via course communication

PLEASE NOTE: It is the learner's responsibility to have purchased all required course materials before the start of the course. Learners are expected to meet all course expectations even if the shipment of a required textbook or other learning resource is delayed. Be sure to choose the shipping option that will get your text/resource delivered in a timely manner.

Learning Outcomes

At the end of the course successful learners will:

- Identify and explain the stages of children's cognitive development, using multiple theoretical perspectives.
 - Apply the constructivist approach to explain and provide examples of how children develop mathematical and scientific thinking.
 - Describe the setting and materials appropriate to providing children with opportunities to expand mathematical and scientific understanding in the classroom and at home.
 - Apply their understanding of developmentally appropriate practice in planning curriculum that promotes logico-mathematical thinking in children through age 8 and accommodates children with special needs and diverse backgrounds.
 - Evaluate the effectiveness of various commercially developed math and science materials (including technology) for preschool and primary classrooms.
 - Apply principles of the Project Approach which integrate all aspects of curriculum based upon children's interests.
 - Analyze children's books and teacher resources for their use in developing scientific and mathematical thinking.
 - Critically reflect on best practices in facilitating scientific and mathematical thinking in children.
 - Demonstrate their reflective learning skills and professional growth by selecting a completed assignment and submitting a written reflection for their portfolio as a culminating experience.
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Major Assignments

Students will complete the following assignments in order to meet the learning objectives of the course:

Course Participation 30%

Discussion Board. Participation means displaying knowledge of the reading material on a weekly basis. At the start of each module, I will post chapter-related discussion questions. You will be asked post your responses based on the readings and your personal experience teaching children for others to see at their convenience. During the week, you are to respond to the postings of two other students. The key to making this interaction meaningful is not how many times you post; it's the quality of your thinking and reflection that counts the most. Please see the Participation Rubric in Course Contents for more details. [The average of your Discussion Board Participation and Small Group Participation is worth 30% of your grade.](#)

Small Group Participation. At the beginning of the term, the class will be divided into small work groups of students. These groups will be in effect throughout the course. You will work with your small groups giving and receiving feedback on a science or math unit that you will begin writing in the 4th module, will be presenting in the seventh module in a face to face class, and then will revise for the final module. Each student will write his or her own unit and post for the small group to review. Students will then use peer feedback to improve the lessons in the unit and submit both versions. [The average of your Discussion Board Participation and Small Group Participation is worth 30% of your grade.](#)

Quizzes 10%

Quizzes are multiple-choice, fill in the blank, short answer and a time line or chart. Quizzes must be completed in the module they are offered. All quizzes will be based on the text and additional assigned readings, you may use your texts as you take the quiz. Quizzes are not timed. The average of your grade on the four quizzes is worth 10% of your grade.

Review of Materials 30%

- Review **six** math or science materials (ex. unit blocks, microscopes, counting bears, etc.) that are currently in use in your classroom. List each material, **and** evaluate how it is used in your room for math or science. (Module 3)
- Review **five** new materials you would like to add for use in your classroom. Discuss how you would utilize each new material. (Module 3)
- **Two** new ideas: create two new ways to include math or science in your classroom, they can be an adaptation of something you already use, or some new concept completely. (Module 3)
- Post a review of **three** commercially available materials designed for teaching math and science. Review will include a cost for value analysis as well as effectiveness for promoting learning. (Module 5)
- Select and reflect on **three** children's books- how could they be used in a math or science unit. (Module 7)
- Select and reflect on **two** "teacher" materials- kits, books or prepared unit for teaching math and science. Evaluate how easy they are to use, how valuable to you as a teacher, and how appropriate for the children you teach. (Module 7)

Unit Portfolio Project 30%

- Lesson plans for a one week unit in math and/or science. Including an explanation of how your plans will support mathematical or scientific thinking in children by applying appropriate learning theory, how the plan could be adapted to include children with special needs, and children with diverse backgrounds. (Module 4)
- Reflection and personal critique of what happened when you taught the lessons; what went well, what could have been stronger, and changes you would make the next time you teach this unit. (Module 6)
- Present to whole class in face to face session. (Module 7)
- Final write up of unit, reflections and feedback from team members, as well as from whole group. (Module 8)

Please Note: Each student enrolled in an Early Childhood Education Program at GSC is required to prepare a portfolio as part of the graduation requirement.

Evidence of Accomplishment

Grades will be assigned using GSC guidelines, rubrics and scales. Course grades will be based on an evaluation of the student's performance on the following assignments:

Course Activity	% of Final Grade
Course Participation	30%
Quizzes	10% (all combined)
Unit Portfolio Project (Includes Lesson Plan, unit and reflection)	30%
Review of Materials	30%

Total	100%
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Course Grading Scale: The letter grade is representative of Granite State College's grading system.

A: 100-95	B: 86-84	C: 76-74	D: 66-64
A-: 94-90	B-: 83-80	C-: 73-70	D-: 63-60
B+: 89-87	C+: 79-77	D+: 69-67	F: 59-0

NOTE: Students must receive a grade of "C" or better for all courses in their major.

Academic Honesty

An academic community is based on honesty and integrity. All work that you submit should be your own. When summarizing or explaining ideas that are based on another's work, make sure to cite references appropriately. (For more information on proper citation, see the Library's website: <http://granite.edu/library/citing.htm>). Plagiarism will not be tolerated. Plagiarism is using another's words or even paraphrasing another's work without giving proper credit through the use of citations. For questions regarding Granite State College's academic honesty policy, see pages 65 of the college catalog.

Outline of Course Structure & Content

The course is broken down into the following Modules and Major Activities:

Module	Major Assignments
Module 1: Learning Theory, How Children Learn July 12 - 18	<ul style="list-style-type: none"> • Read: Theorists and Theories • Quiz on Theorists & Theories • Quiz on compare and contrast • Quiz on Time line • Read: The Young Child and Mathematics Chapters 1-3 • Quiz: Math is...
Module 2: Constructivist Approach July 19 - 25	<ul style="list-style-type: none"> • Read: The Young Child as Scientist: A Constructivist Approach to Early Childhood Science Education Chapters 1-4 • Submit definition of constructivist theory • Post two examples of children engaged in mathematical or scientific thinking • Discussion Board: Questions we can use to prompt scientific or mathematical thinking
Module 3: Providing Opportunities to Expand Mathematical and Scientific Understanding July 26 - August 1	<ul style="list-style-type: none"> • Read: The Young Child and Mathematics Chapters 4-6 • Post list of six math or science materials currently used by children in your classroom • Post two new ideas for additions to enhance mathematic or scientific thinking in your classroom • Post five new materials you would like to add to your classroom
Module 4: Planning Curriculum that Meets the Needs of All Children August 2 - 8	<ul style="list-style-type: none"> • Read: The Young Child as Scientist: A Constructivist Approach to Early Childhood Science Education Chapters 5 & 6 • Create a math or science unit, with lesson plans for one week (min. 5, max 7) • Submit to small group for feedback (by Wednesday, Aug 6)

	<ul style="list-style-type: none"> • Post feedback on plans of group members (by Friday, Aug 8)
Module 5: Evaluating the Effectiveness of Commercially Produced Materials Aug 9 - 15	<ul style="list-style-type: none"> • Read: The Young Child as Scientist: A Constructivist Approach to Early Childhood Science Education Chapters 7 & 8 • Identify and review three commercial products designed for teaching math or science concepts (by Aug 11) • Rank class list of materials most likely to add to your classroom based on review, to least likely based on review.
Module 6: Project Approach Aug 16 - 22	<ul style="list-style-type: none"> • Read: The Young Child and Mathematics Chapters 7-9 • Teach unit • Reflect on success of lessons
Module 7: Evaluating Children's Books and Teacher Materials, Presentations of Math and Science Portfolio Aug 23 - 29	<ul style="list-style-type: none"> • Select three children's books you could use in a math or science unit and review them • Select two teacher resource materials for math or science and review them • Present unit on August 23rd
Module 8: Evaluation of Final Projects Aug 30 - Sept 5	<ul style="list-style-type: none"> • Submit final project, all copies of drafts, feedback from small group, feedback from whole group, and self-reflection.

Note: The content of this syllabus is subject to change as needed.

ADA

Granite State College will provide qualified individuals with disabilities the same educational opportunities available to persons without disabilities. When an individual's documented disability creates a reasonable accommodation to remove the barrier. If you need assistance, it is important that you make contact early to ensure that your requests can be reviewed prior to the start of each term. If you wish to apply for accommodations, contact your academic advisor or the dean of learner services in the Administration Offices in Concord. See ADA in the college catalog for details.

Institutional Assessment

Assessment is an ongoing process that enables the College to improve its programs, courses, and teaching methods. Institutional evaluation may be embedded in tests, exams, and other measurements of student learning. As members of a learning community, students, faculty, and staff will be expected to participate in the important process of assessment on occasion. Confidentiality of any data that identify participants is maintained.

Technical Assistance

For assistance with accessing your course or with other technical issues regarding your online course, contact the [GSC Technical Assistance Center](#) (<http://bbresources.granite.edu/techassist/help.htm>) or call **1-888-372-4270** (Hours: M-F, 8:30-5:00, on weekends messages are checked daily).