

EDUC 4262 Departmental Syllabus**TEACHING CONTENT AND PROCESS: SCIENCE EDUCATION**

3 Semester Hours

COURSE DESCRIPTION

Prerequisite: Admission to Teacher Education. Students will examine content, methodology, skills and materials used to teach science to children in grades P-5 by means of course discussions and assignments, field placements/assignments, and course readings. Emphasis will be placed on developmentally appropriate practices and integration with mathematics and other appropriate subject areas.

CONCEPTUAL FRAMEWORK

The Division of Education's mission is to provide excellence in the initial preparation of professional educators for diverse settings who are competent and effective teachers, who can bring diverse learners to high academic achievement and to be able to work toward school improvement. This mission statement is supported by the Division's philosophy embedded in the purpose statements, and further expressed in the Division's goals, is the content for how professional, state, and institutional standards are addressed in the professional teacher education programs. Proficient demonstration of the Professional Outcomes (knowledge, skills, and dispositions) of the Conceptual Framework embraces the competencies and proficiencies of the INTASC Principles and the Georgia State Standards. The Division believes that each of the Professional Outcomes is of equal value, and is critical to the preparation of professional educators to be competent and effective teachers, and leaders in school improvement. Faculty members emphasize the importance of preparing caring, dedicated, skilled professional educators who are committed to offering children equitable educational opportunities to become lifelong learners. The ten Professional Outcomes (Knowledge, Adaptive, Leader, Decision Maker, Proactive, Culturally Sensitive, Reflective, Empathetic, Collaborative and Lifelong Learner) are what the Division believes proficient teacher candidates should exhibit upon program completion.

COURSE OBJECTIVES

The students will:

1. demonstrate the integration of physical, life, and earth science concepts relevant to elementary school science curricula (Martin, 2003) (*Knowledgeable*; INTASC 1, 2, 3, 4, 5, 6, 7, 8; GPS 1,2)
2. select appropriate teaching strategies for teaching science skills, attitudes, and knowledge to elementary children (Martin, Sexton, Gerlovich, 2002) (*Adaptive*; INTASC 3, 8; GPS 1-2)

3. explain the developmental and cultural differences in children's thinking as it relates to science learning (Barba, 1998) (*Adaptive, Empathetic, Knowledgeable*; INTASC 1, 2, 3, 4, 5, 6, 7, 8; GPS 1)
4. identify appropriate resources, materials, and technology for use with teaching science (Carin & Bass, 2001) (*Decision Makers*, INTASC 7; GPS 2)
5. explain the dominant views of science education and strengths and weaknesses of each view (Martin, 2003) (*Knowledgeable*; INTASC 1, 2, 3, 4, 5, 6, 7, 8; GPS 2)
6. demonstrate ability to develop science lesson plans and units of study that reflect appropriate integration on other subject matter (Carin & Bass, 2001) (*Collaborative, Knowledgeable*; INTASC 1, 2, 3, 4, 5, 6, 7, 8, 10; GPS 2)
7. articulate the issues and strategies for teaching science to disadvantaged, minority, and special student populations (Martin, Sexton, & Gerlovich, 2002) (*Culturally Sensitive, Empathetic*, INTASC 1, 3, 8, 5, 6, 7, 10; GPS 1,2)
8. demonstrate positive scientific attitudes and interest in teaching and learning about the natural world (Friedl & Koontz, 2001) (*Lifelong Learners*; INTASC1, 2, 3, 4,5; GPS 2)
9. demonstrate the ability to manipulate simple science equipment found in most elementary schools (National Research Council, 1996) (*Knowledgeable*; INTASC 1, 2, 3, 4, 5, 6, 7, 8; GPS 2)
10. assess student learning in science through use of authentic means such as performance tasks, anecdotal records, and portfolios (Tippins, Koballa & Payne, 2002) (*Reflective*; INTASC 4, 9; GPS 4)
11. apply theories of learning in educational settings (Martin, 2003) (*Adaptive*; INTASC 3, 8; GPS 2,6)
12. apply problem solving and decision making strategies to societal, scientific and technological issues (National Research Council, 1996) (*Decision Makers, Reflective*; INTASC 1, 2, 3, 4, 5; GPS 2)
13. teach a science lesson in their assigned field placement classroom (Carin & Bass, 2001) (*Knowledgeable*; INTASC 1, 2, 3, 4, 5, 6, 7, 8; GPS 6).

TEXTS, READINGS, AND INSTRUCTIONAL RESOURCES

Required Texts: Abruscato, Joseph. (2004). *Teaching children science*, 6th ed. Boston: Allyn and Bacon

Websites: Georgia Learning Connection – QCC – www.glc.k12.ga.us
 Georgia Performance Standards – GPS www.georgiastandards.org
 National Science Education Standards – www.nap.edu/html/nses/html/

Knowledge and Research Base:

- Barba, R. H. (1998). *Science in the multicultural classroom* (2nd ed.). Boston: Allyn and Bacon.
- Blough, G., & Schwartz, J. (1990). *Elementary school science and how to teach it* (8th ed.). Chicago: Holt, Rinehart and Winston, Inc.
- Carin, A. A., & Bass, J. E. (2001). *Teaching science as inquiry* (9th ed.). Upper Saddle River, NJ: Merrill Prentice Hall.
- Coucher, H. (1992, March). Outstanding science trade books for children in 1991. *Science and Children*.
- Doris, E. (1991). *Doing what scientists do*. Portsmouth, NH: Heinemann Press.
- Duckworth, E. (1991). *The having of wonderful ideas and other essays*. Columbia: Teachers' College Press.
- Estes, Y. (1993). Environmental education. *Kappan*. Bloomington, IN: Phi Delta Kappa.
- Friedl, A. E., & Koontz, T. Y. (2001). *Teaching science to children: An inquiry approach* (5th ed.). Boston: McGraw-Hill.
- Greene, L. (1991, October). Science Centered Curriculum in Elementary School. *Educational Leadership*.
- Harlan, J. (1992). *Science experiences for the early childhood years* (5th ed.). New York: Macmillan Publishing Company.
- Lind, K. (1991). *Exploring science in early childhood: A developmental approach*. Albany, New York: Delmar Publishers.
- Martin, D. J. (2003). *Elementary science methods: A constructivist approach* (3rd ed.). Belmont, CA: Wadsworth Publishers.
- Martin, R., Sexton, C., & Gerlovich, J. (2002). *Teaching science for all children: Methods for constructing understanding* (2nd ed.). Boston: Allyn and Bacon.
- National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press
- Pomeroy, D. (1992, Fall). *Exploring science across cultures*. Cambridge: HGSE Bulletin.
- Tippins, D. J., Koballa, Jr., T. R., & Payne, B. D. (2002). *Learning from cases: Unraveling the complexities of elementary science teaching*. Boston: Allyn and Bacon.

ASSIGNMENTS, EVALUATION PROCEDURES, AND GRADING POLICY

Links to the Conceptual Framework: The focus of this course is on examining the content, methodology, skills and materials used to teach science to children in grades P-5 by means of course discussions and assignments, field placements/assignments, and course readings. Emphasis is placed on developmentally appropriate practices and integration with mathematics

and other appropriate subject areas. The overall evaluation of this course is structured so that each assignment is aligned with achieving course objectives. Because of the many objectives of this course, each conceptual framework descriptor is covered in course assignments. At the completion of the course, students will have demonstrated achievement in the areas of *decision making* by identifying appropriate resources, materials, and technology for use with teaching science and by applying problem solving and decision making strategies to societal, scientific and technological issues (Assignments 3,4,5), *knowledgeable* by demonstrating the integration of physical, life, and earth science concepts relevant to elementary school science curricula, explaining the dominant views of science education and strengths and weaknesses of each view, demonstrating the ability to develop science lesson plans and mini lessons that reflect appropriate integration on other subject matter and demonstrating the ability to manipulate simple science equipment found in most elementary schools (Assignments 1-5). Students will demonstrate achievement in being *adaptive* by selecting appropriate teaching strategies for teaching science skills, attitudes, and knowledge for elementary children, by explaining the developmental and cultural differences in children's thinking as it relates to science learning, and by applying theories of learning in educational settings (Assignments 5,6), *collaborative* by demonstrating the ability to develop science lesson plans and mini lessons that reflect appropriate integration on other subject matter with other educators (Assignments 3,4), *culturally sensitive and empathetic* by articulating the issues and strategies for teaching science to disadvantaged, minority, and special student populations (Assignments 4,5,6), *lifelong learners* by demonstrating positive scientific attitudes and interest in teaching and learning about the natural world (Assignments 3,4), *reflective* by assessing student learning in science through use of authentic means such as performance tasks, anecdotal records, and portfolios (Assignment 6).