

Eastern Illinois University  
Department of Early Childhood, Elementary, and Middle Level Education  
ELE3290.002-Science in the Elementary School



**Instructor:** Denise E. Reid  
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**Theme: Educators as Creators of Effective Educational Environments**

**Catalog Description:** Science in the Elementary School. (3-0-3). Exploration of the nature, processes, and products of science and their relationships to society, the world, and the school curriculum. Field-based experiences will be in conjunction with Elementary Education 4000.

**Prerequisites & Notes:** ELE3000 and six semester hours in science. Concurrent enrollment with ELE3340, ELE4880, and ELE4000 (practicum) is recommended.

**Purpose of the Course:** To involve students in the process of learning about the nature of science; a sample of its content and the methods used to teach the content. Using theories of how children learn as a basis for instruction, the students develop their skills at teaching science processes through discovery, guided discovery, and inquiry lessons. Students will also understand the importance of assessment and evaluation, and will develop various means of assessment. *Students will integrate technology in their lessons, projects, and science units.*

**Course Text & Other Materials**

Martin, R., Sexton, S., Wagner, K., & Gerlovich, J. (2005). *Teaching science for all children* (4th ed.). Boston: Allyn and Bacon.

Carin, A. A., Bass, J. E., Contant, T. L. (2005). *Activities for teaching science as inquiry* (6<sup>th</sup> ed.). Upper Saddle River, NJ: Pearson, Merrill Prentice Hall.

Supplemental Materials: LiveText Account & Course packet purchased from Copy Express in the student union.

**Learning Model:** The Information Processing Family Models: Scientific Inquiry & Inquiry Training  
Joyce, B., Weil, M., & Calhoun, E. (2009). *Models of teaching*. (8th ed.). Boston: Pearson.

The Scientific Inquiry Model used The Biological Sciences Curriculum (BSCS) model as one example of a curriculum that uses inquiry teaching in developing science curriculum. “The essence of the model is to involve students in a genuine problem of inquiry by confronting them with an area of investigation, helping them identify a conceptual or methodological problem within that area of investigation, and inviting them to design ways of overcoming the problem.” (p. 169) In addition, the Scientific Inquiry Model uses the work of Richard Suchman to support the Inquiry Training Model. Suchman believed that students can be conscious of their process of inquiry and can be taught the scientific procedures directly. “The model promotes strategies of inquiry and the values and attitudes that are essential to an inquiring mind, including: process skills; active, autonomous learning; verbal expressiveness; tolerance of ambiguity; persistence; logical thinking; and an attitude that all knowledge is tentative.” (p. 185)

There are different levels of inquiry, from guided to full inquiry. One teaching and learning model that supports inquiry and provides a framework to help teachers become more effective in using inquiry approaches is the Learning Cycle Model. The original Learning Cycle Model was developed by Professor Robert Karplus and colleagues at the University of California-Berkeley and consisted of three components: exploration, concept introduction, and concept application. The current model has been modified by BSCS and has five components: Engagement, Exploration, Explanation, Expansion, and Evaluation. (Moyer, R. H., Hackett, J. K., & Everett, S. A. (2007). *Teaching Science as investigations: Modeling inquiry through learning cycle lessons*. Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.)

The BSCS 5E Instructional Model

<http://www.bsccs.org/curriculumdevelopment/features/bsccs5es.html>

**Dispositions:** Teacher candidates in the Department of EC/ELE/MLE will exhibit professional ethical practices, effective communication, and sensitivity to diversity; the ability to provide varied teaching practices evidenced in a supportive and encouraging environment.

**Live Text Assessment Requirement:** For those classes with Live Text or Practicum- If the portfolio or Live Text requirements are rated, by the instructor, to have been completed in less than a satisfactory manner then no more than a "D" may be earned in the class regardless of the number of points earned.

**ELE3290 Standards**

Course requirements and demonstrated competencies are aligned with the following standards:

- Association for Childhood Education International Standards (ACEI)  
<http://www.acei.org/Synopsis.htm>
- Illinois Standards for Certification in Special Teaching Fields-Elementary  
[http://www.isbe.net/profprep/CASCDvr/pdfs/26310\\_elementaryed.pdf](http://www.isbe.net/profprep/CASCDvr/pdfs/26310_elementaryed.pdf)
- Illinois Professional Teaching Standards (IPTS) <http://www.isbe.state.il.us/profprep/PDFs/ipts.pdf>
- Illinois Core Language Arts Standards (ICLAS)  
[http://www.isbe.net/profprep/CASCDvr/pdfs/24110\\_corelangarts\\_std.pdf](http://www.isbe.net/profprep/CASCDvr/pdfs/24110_corelangarts_std.pdf)
- Illinois Core Technology Standards (ICTS)  
[http://www.isbe.net/profprep/CASCDvr/pdfs/24100\\_coretechnology.pdf](http://www.isbe.net/profprep/CASCDvr/pdfs/24100_coretechnology.pdf)

**Course Outcomes**

1. The students will exhibit a positive attitude toward providing meaningful experiences in science for your students.
2. The students will demonstrate an understanding of the nature of science, the learner, and the learning environment.
3. The students will demonstrate a working knowledge of appropriate science learning and hands-on inquiry experiences for children.
4. The students will exhibit the ability to effectively utilize various types of materials, resources, and media to engage children in meaningful science experiments.
5. The students will demonstrate knowledge of assessment and evaluation procedures for science.
6. The students will demonstrate the ability to plan, implement, and assess science instruction for elementary students.
7. The students will become familiar with the Illinois Learning Standards for Science and the National Science Education Standards.

**Course Content:** The nature of science: Science attitudes, knowledge, and skills; D.A.S.T.; Process Skills; Constructivism; Science Misconceptions; Inquiry; Demonstration lessons and discrepant events; NSES (National Science Education Standards); Illinois Learning Standards; Science Content (Life Science, Physical Science, & Earth & Space Science); Literature & Science; Scope & Sequence Charts (Science Curriculum); Science concepts; Authentic Assessment; The Learning Cycle Model; Simulations; Project Based Learning; Science Teacher Resources.

**Course Requirements**

Course Requirements	Demonstrated Competencies	Aligned Standards (ACEI, ELE, IPTS, ICTS, ICLAS)
Participation	Performance includes presence, participation and preparation for	ACEI 5.1